

1 **OPERATIONS, MAINTENANCE & ADMINISTRATION (“OM&A”) OVERVIEW**

2
3 Toronto Hydro’s 2025-2029 Custom Incentive Rate Framework set out in Exhibit 1B, Tab
4 2, Schedule 1 includes a mechanism to enable multi-year rate funding for operational
5 investments as well as capital expenditure needs. The proposed 2025-2029 Operations,
6 Maintenance & Administration (“OM&A”) plan represents the minimum investments
7 necessary to deliver the Distribution System Plan (“DSP”) outlined in Exhibit 2B and
8 achieve key outcomes valued by customers and the OEB under the Renewed Regulatory
9 Framework (“RRF”).

10
11 In addition to enabling Toronto Hydro to attract and retain the necessary resources to
12 carry out its DSP and deliver customer outcomes in next rate period and beyond, the
13 OM&A plan addresses other key operational requirements, including:

- 14 • integrating cloud computing and non-wires solutions into operations;
- 15 • responding to evolving policy and customer expectations to connect behind-the-
16 meter technologies such as electric vehicles, solar panels, and energy storage;
- 17 • protecting customers’ data and the grid against intensifying cyber security threats
18 driven by rapid technology advancements and changing geopolitical dynamics;
- 19 • complying with new or expanded legal and regulatory requirements, including
20 customer service, safety, and environmental obligations;
- 21 • maintaining safe, reliable, and effective operations across a multitude of key utility
22 functions including Emergency Response, Supply Chain, Fleet, Facilities, and
23 Information Technology (“IT”);
- 24 • addressing a variety of externally-driven costs, including insurance premiums, bad
25 debt expenses, and regulatory costs; and

- 1 • keeping up with asset maintenance requirements to ensure the grid remains safe
 2 and reliable for customers.

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 4 This schedule provides an overview of Toronto Hydro’s current 2020-2024 and future
 5 2025-2029 OM&A plan. The drivers underpinning Toronto Hydro’s OM&A plan are
 6 specific, tangible, and urgent, with the most pressing needs highlighted in section 5 of this
 7 schedule, and detailed evidence supporting the entire plan provided in Exhibit 4, Tab 2.
 8 Tables 1 and 2 below provide breakdowns of Toronto Hydro’s OM&A expenditures by
 9 program for the historical and bridge years (2020-2024), and forecast years (2025-2029),
 10 respectively.

11
 12 **Table 1: Historical and Bridge Year OM&A Expenditures by Program (\$ Millions)¹**

Programs	Actual			Bridge	
	2020	2021	2022	2023	2024
Preventative and Predictive Overhead Line Maintenance	5.8	6.2	5.7	7.2	7.9
Preventative and Predictive Underground Line Maintenance	5.1	4.4	5.7	6.3	6.1
Preventative and Predictive Station Maintenance	5.9	6.4	5.5	6.5	7.0
Corrective Maintenance	23.1	26.5	23.5	24.9	25.6
Emergency Response	22.1	23.0	22.0	20.4	23.1
Disaster Preparedness Management Program	6.0	5.5	4.9	1.3	1.8
Control Centre Operations	7.6	6.0	6.5	7.4	7.9
Customer Operations	9.3	7.5	9.0	12.6	12.8
Asset and Program Management	13.4	11.9	13.1	13.5	14.0
Work Program Execution	11.0	14.2	17.3	14.3	15.2
Fleet and Equipment Services	9.3	8.5	7.8	8.7	9.1
Supply Chain Services	15.8	12.9	13.8	16.7	18.8
Facilities Management	24.3	26.0	25.0	26.0	27.9

¹ Numbers may not sum due to rounding.

Programs	Actual			Bridge	
	2020	2021	2022	2023	2024
Customer Care	55.7	39.3	39.3	44.9	48.4
Human Resources, Environment and Safety	15.5	17.6	16.7	18.9	21.3
Finance	16.4	17.9	18.4	20.9	22.9
Information Technology	48.0	50.6	53.5	57.5	61.1
Legal and Regulatory	18.5	19.0	19.2	24.7	28.0
Charitable Donations and LEAP	1.0	1.0	1.0	1.3	1.4
Common Costs and Adjustments	(0.2)	(0.3)	(1.0)	(1.1)	(0.9)
Allocations and Recoveries	(25.5)	(26.6)	(26.5)	(31.4)	(33.9)
Total OM&A	288.1	277.5	280.4	301.5	325.5

1

2 **Table 2: Forecast Year OM&A Expenditures by Program (\$ Millions)²**

Programs	Forecast				
	2025	2026	2027	2028	2029
Preventative and Predictive Overhead Line Maintenance	9.1	9.2	9.6	9.5	9.4
Preventative and Predictive Underground Line Maintenance	6.8	7.0	6.7	7.1	7.0
Preventative and Predictive Station Maintenance	8.0	7.6	7.7	8.6	8.8
Corrective Maintenance	29.5	30.7	31.0	32.0	33.6
Emergency Response	25.9	26.4	27.2	27.9	28.6
Disaster Preparedness Management Program	1.9	1.9	2.0	2.1	2.2
Control Centre Operations	8.3	9.0	9.5	10.0	10.5
Customer Operations	12.7	13.1	13.7	14.1	14.6
Asset and Program Management	14.2	15.8	16.6	17.9	18.7
Work Program Execution	16.0	16.8	17.9	18.5	19.4
Fleet and Equipment Services	9.3	9.6	9.8	10.0	10.3
Supply Chain Services	21.5	23.5	24.9	25.5	27.1
Facilities Management	27.9	28.4	28.9	29.6	30.3
Customer Care	48.6	51.6	52.5	54.4	56.1

² Numbers may not sum due to rounding.

Programs	Forecast				
	2025	2026	2027	2028	2029
Human Resources, Environment and Safety	22.6	23.2	24.2	25.3	26.3
Finance	24.4	26.2	27.6	29.4	31.1
Information Technology	63.3	65.8	68.7	71.7	75.1
Legal and Regulatory	29.9	30.9	32.0	33.2	34.2
Charitable Donations and LEAP	1.5	1.6	1.7	1.8	1.9
Common Costs and Adjustments	(0.9)	(0.9)	(0.8)	(0.8)	(0.8)
Allocations and Recoveries	(37.5)	(39.4)	(41.2)	(42.3)	(44.8)
Total OM&A	343.0	358.0	370.2	385.5	399.6

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2 The programs that constitute Toronto Hydro’s plan are largely a continuation of its 2020-
 3 2024 OM&A programs, which are critical to the safe and reliable operation of the
 4 distribution system, delivering timely and effective customer-facing services, and fulfilling
 5 critical corporate functions that allow the utility to operate in a financially responsible and
 6 legally-compliant manner. However, the utility is not operating in a stable state as
 7 detailed in the discussion of the funding need in the Rate Framework in Exhibit 1B, Tab 2,
 8 Schedule 1, and discussed in brief below. Instead, these operational programs must be
 9 delivered in an environment of increased volume and increased complexity of work driven
 10 by evolving customer needs, requirements, and expectations.

11

12 The information presented in this OM&A overview schedule is organized as follows:

- 13 • Section 1 contextualizes Toronto Hydro’s OM&A investment plan;
- 14 • Section 2 outlines historical productivity and benchmarked efficiency trends;
- 15 • Section 3 presents the workforce needs and challenge underpinning the plan;
- 16 • Section 4 describes Toronto Hydro’s business planning process;
- 17 • Section 5 identifies key drivers necessitating forecast OM&A expenditures;
- 18 and

- 1 • Section 6 sums up the preceding information with a macro level causal track
2 analysis.

3

4 **1. THE OM&A PLAN IN CONTEXT**

5 In the current rate period, Toronto Hydro’s operating parameters shifted from a relatively
6 linear and stable environment to a more dynamic, growth-oriented context, predicated
7 on significant increases in future customer demand driven by an unprecedented energy
8 transition that is creating new and expanded roles for electricity within the economy. The
9 DSP in Exhibit 2B outlines in detail the capital investments required to address these new
10 imperatives, while also sustaining existing infrastructure in accordance with good utility
11 practices. However, asset readiness is only part of the solution required to meet the needs
12 of customers and the system in an electrified future state. Toronto Hydro must also invest
13 in human capital and other operational priorities to deliver the increasing and evolving
14 capital plan and ensure that customers are not underserved in the next decade as the
15 pace of the energy transition intensifies.

16

17 As the utility takes least-regrets actions to expand and modernize the grid to be ready
18 and equipped for a once-in-a century transformation of the energy system, it similarly
19 needs to invest in resources with new and enhanced skill sets to get the work done safely
20 and cost-effectively. However, not all of these resources can be capitalized under existing
21 accounting standards and practices, nor do all the solutions to expand and modernize the
22 grid entail capital investments. Technological advancements offer new digital tools and
23 smart grid solutions to address system needs and deliver cost-effective customer services.
24 Taking advantage of these opportunities requires investment in both capital assets (i.e.
25 hard infrastructure like sensors, switches, and reclosers, and intangibles like software

1 systems) and in operational programs where approximately 50 percent of the costs
2 related to human capital typically reside.

3 Since 2015, Toronto Hydro has served the needs of a growing city, evolving customer and
4 policy demands, and an aging and deteriorating system, while addressing intensifying
5 challenges—brought on by factors such as urban development and densification, more
6 frequent instances of extreme weather, and evolving cyber security threats—with a
7 staffing complement that is essentially flat from 2015 to 2024. After nearly a decade of
8 realizing sustained efficiencies and managing complex operations with a flat headcount,
9 Toronto Hydro requires incremental funding to hire and retain necessary resources
10 without compromising the utility’s financial viability.

11

12 Entering the next rate term, it is no longer possible nor prudent for Toronto Hydro to
13 meet its obligations without additional resources. From 2024 through to 2029, Toronto
14 Hydro’s workforce is expected to grow by roughly 25 percent to sustain the foundations
15 of a safe and reliable grid while also meeting the imperatives of an urban city and
16 customers who are increasingly relying on electricity to expand, digitize, and decarbonize
17 their footprint. Relative to the increase in the capital plan that the utility must deliver to
18 get the grid ready and achieve outcomes for customers during this transformational time,
19 the pace of workforce growth and related OM&A increases demonstrates Toronto
20 Hydro’s ongoing commitment to be efficient and productive. Specifically, the linear trends
21 in Figure 1 below shows that from 2015-2029 (a 14-year period spanning three custom
22 incentive rate cycles) Toronto Hydro has delivered, and intends to continue delivering, a
23 larger capital program with an increase in resourcing and related OM&A costs that is
24 comparatively much lower than the rate of growth in the capital program.

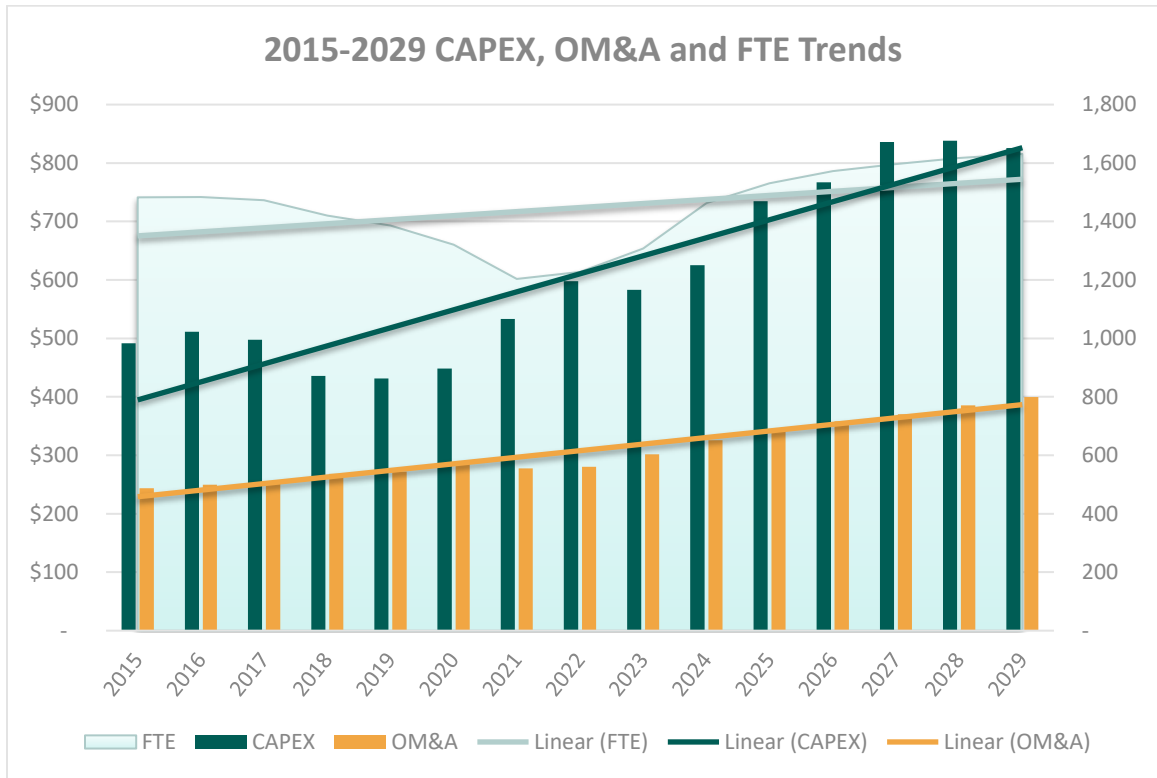


Figure 1: Comparing 2014-2029 Linear Trends in CAPEX, OM&A and FTEs

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The full-time employee (“FTE”) and OM&A trends identified in Figure 1 above reflect the continuation of a productivity journey in the last decade that has produced a demonstrably lean staffing complement. Notably, benchmarking shows that relative to other large and mid-sized distributors in Ontario, Toronto Hydro’s workforce is well below the average when compared using various key ratios such as of net fixed assets (“NFA”) per FTE, FTEs by system load (MWh), and FTEs per km of line. This benchmarking data is presented and further detailed in section 2 below.

1.1 Key Themes and Trends

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Toronto Hydro’s 2025-2029 OM&A plan is forecasted at approximately \$1,856 million, representing a 26 percent increase over the current 2020-2024 period, compared to a 44

1 percent proposed increase in capital investment, as outlined in the DSP in Exhibit 2B.
2 Efficient deployment of operational funding and staffing costs over the last decade, as
3 further discussed below, has enabled Toronto Hydro to bring forward in this application
4 an operational plan that (i) supports the execution of a larger capital program necessary
5 to expand and modernize the grid for the future, while (ii) continuing to deliver high
6 performance on service quality metrics, with (iii) an increase in operational budgets that
7 is comparatively lower than the capital program.

8
9 In 2025, the first year of the next rate period, Toronto Hydro’s forecasted OM&A budget
10 is approximately \$343 million, representing a compound annual growth rate of 5.16
11 percent from the utility’s approved OM&A in the 2020 rebasing application (EB-2018-
12 0165). On a per customer basis, the compound annual growth rate (“CAGR”) from the
13 2020 approved to the 2025 proposed budget is approximately 4.66 percent. Over the
14 same period (2020 to 2025), Toronto Hydro’s OM&A costs per FTE (a measure of
15 workforce productivity per OEB Appendix 2-L),³ are increasing at a CAGR of 2.1 percent,
16 which is less than the average rate of inflation over this period, per the OEB’s parameters
17 for 2021-2024,⁴ and assuming a return to stable pre-pandemic inflation levels of 2 percent
18 in 2025, consistent with the Bank of Canada’s economic outlook.⁵ Inflation is a measure
19 that reflects the increasing cost of input prices, including labour. The fact that operational
20 expenses per FTE are growing at a rate less than inflation shows that input prices related
21 to labour are being managed efficiently through the utility’s compensation and staffing

³ OEB Filing Requirements for Electricity Distribution Rate Applications Chapter 2 – Cost of Service (December 15, 2022), s. 2.4.2 “OM&A Summary and Cost Driver Tables”.

⁴ OEB Letter Re: *2021 Inflation Parameters* (November 9, 2020); EB-2021-0212, OEB Decision and Order, *2022 Input Price Index Generic Proceeding* (November 18, 2021); OEB Letter re: *2023 Inflation Parameters* (October 20, 2022); OEB Letter re: *2024 Inflation Parameters* (June 29, 2023).

⁵ Bank of Canada, *Monetary Policy Report* (October 2023), online: <<https://www.bankofcanada.ca/wp-content/uploads/2023/10/mpr-2023-10-25.pdf>> at page 1.

1 strategy. Table 3 below details the facts and trends outlined above, which are also
 2 presented in OEB Appendix 2-L at Exhibit 4, Tab 1, Schedule 5.

3
 4 **Table 3: 2020-2025 OM&A Trends**

	2020 Test	2021 Actuals	2022 Actuals	2023 Bridge	2024 Bridge	2025 Test	2020-24 CAGR
OM&A (\$M)	266.7 ⁶	277.5	280.4	301.5	325.5	343.0	5.16%
OM&A per Customer (\$)	341.3	352.9	354.6	379.7	408.2	428.5	4.66%
OM&A per FTE (\$)	201,892	230,673	228,524	230,680	222,488	224,036	2.10%

5
 6 Over the next rate period, from 2025 to 2029, Toronto Hydro forecasts OM&A costs to
 7 increase at a CAGR of 3.89 percent with a corresponding growth in OM&A per customer
 8 of 3.54 percent and OM&A per FTE of 2.26 percent, as shown below in Table 4.

9
 10 **Table 4: 2025-2029 OM&A Trends**

	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast	2025-29 CAGR
OM&A (\$M)	343.0	358.0	370.2	385.5	399.6	3.89%
OM&A per Customer (\$)	428.5	445.6	459.3	476.7	492.6	3.54%
OM&A per FTE (\$)	224,036	227,735	231,954	238,404	245,003	2.26%

11
 12 The growth trends observed in Tables 3 and 4 above are subject to important
 13 considerations regarding workforce-related and customer-correlated costs.

⁶ In EB-2018-0165, the OEB approved a 2020 OM&A budget of \$272.2 million and directed Toronto Hydro to amend the presentation of shared services within Other Revenue, under USoA Accounts 4375 and 4380 for revenues and expenses of non-rate regulated utility operations. Normalized for this change, the 2020 OEB-approved OM&A budget was \$266.7 million.

1 **1.1.1 Workforce Related Costs**

2 Despite workforce being a key driver of the OM&A plan, staffing-related costs (as
3 measured by OM&A per FTE metrics) are growing at a lower rate than the overall plan.
4 Over both rate periods, from 2020 through to 2029, the OM&A CAGR is 4.6 percent
5 whereas OM&A per FTE CAGR is roughly 2.17 percent. Additionally, the OM&A per FTE
6 growth rate over this period is lower than the rate of inflation, which averages at 3.5
7 percent using OEB parameters for 2021-2024 and a 2 percent outlook for 2025-2029,
8 assuming a return to stable pre-pandemic inflation levels of 2 percent, consistent with
9 the Bank of Canada's economic outlook.⁷

10

11 Toronto Hydro requires a custom rate funding solution to secure the human capital
12 necessary to deliver the 2025-2029 investment plan safely and efficiently, maintain the
13 high-service quality performance improvements achieved in the last decade,⁸ and achieve
14 other important outcomes that customers need and value such as improving the
15 resilience of the grid.⁹ Neither cutting compensation costs nor cutting headcount are
16 viable strategies to manage these key objectives within a standard IRM funding
17 framework. Managing workforce-related costs downwards to live within a standard IRM
18 funding paradigm would entail a reduction to Toronto Hydro's overall staffing
19 complement of up to 200 resources by the end of the rate period, putting total FTEs below
20 2015 levels. Since Toronto Hydro already has a demonstrably lean workforce compared
21 to other distributors in the province, as evidenced by the benchmarking results in section
22 2, such a reduction to its staffing complement is not possible or prudent because it would
23 put resourcing at precariously low levels and compromise the utility's performance with

⁷ *Supra* note 5.

⁸ Exhibit 1B, Tab 3, Schedule 2.

⁹ Exhibit 1B, Tab 3, Schedule 1.

1 respect to a multitude of outcomes and risks that pose significant consequences for
2 customers, as further detailed in sections 3 and 5.1 below.

3

4 Similarly, reducing compensation costs per employee is not a viable strategy to live within
5 standard IRM funding for OM&A. The Mercer Compensation Benchmarking study at
6 Exhibit 4, Tab 4, Schedule 5 and similar benchmarking studies filed in past rate
7 applications show that Toronto Hydro's compensation strategy consistently yields costs
8 (i.e. salary and wages) that are market-competitive at the 50th percentile within both the
9 energy sector and general industry. A material reduction to compensation costs per
10 employee, which would have to be implemented by effectively freezing salaries and
11 wages over the 2025-2029 period, would put Toronto Hydro out of compliance with its
12 collective agreement obligations and place the utility's compensation below market
13 levels, compromising its ability to attract and retain the talent it needs to serve customers.

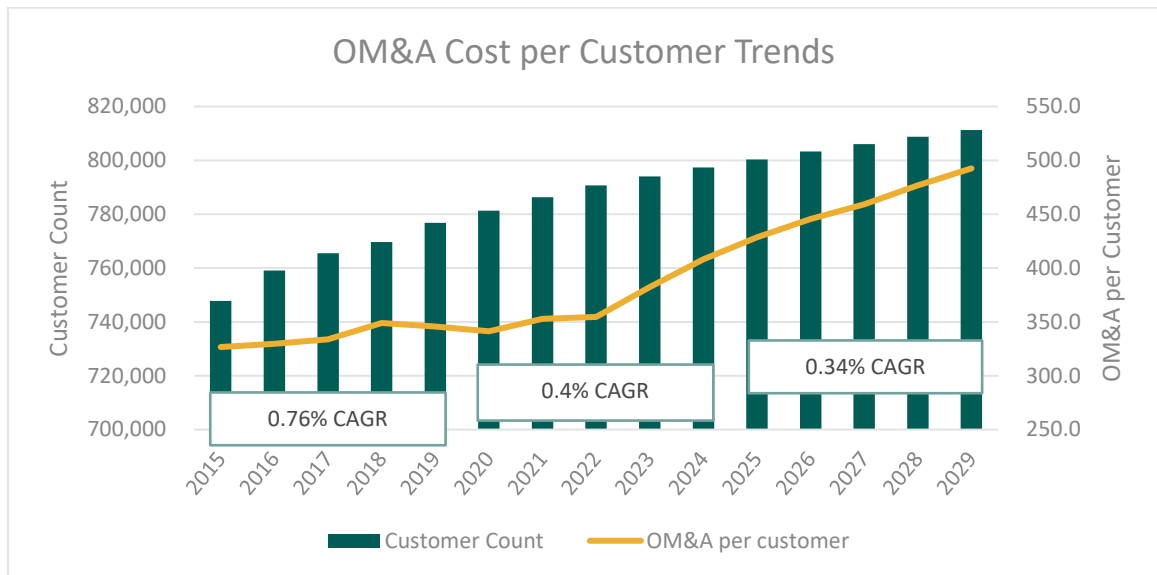
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15 **1.1.2 Customer-Correlated Costs**

16 The other key observation to point out with respect to the cost per customer trends
17 observed in Tables 3 and 4 above is that operating in Canada's densest and fastest
18 (vertically) growing city, Toronto Hydro serves far more end-use customers through bulk-
19 metering and competitive sub-metering arrangements than its actual customer count
20 would otherwise indicate. Based on self-declarations submitted by multi-unit residential
21 buildings for the purposes of Regulated Price Plan elections and the Ontario Electricity
22 Rebate ("OER") program, Toronto Hydro estimates that it serves approximately 340,000
23 end-consumers or more behind bulk meters. As the sub-metering market has become
24 more mature in Toronto over the last decade, a greater share of new multi-unit buildings

1 opt for bulk-metering service connections.¹⁰ The practical effect of operating in this urban
 2 environment with a deregulated sub-metering market is a slower rate of formally
 3 reported customer growth from 2015 to 2029, which is putting artificial upward pressure
 4 on cost performance metrics like OM&A per customer, as shown in Figure 2 below.

5



6 **Figure 2: 2015-2029 OM&A Cost per Customer Trends**

7

8 **1.2 Service Quality and Performance Outcomes**

9 Toronto Hydro’s OM&A expenditures contribute to the achievement of the Renewed
 10 Regulatory Framework (“RRF”) outcomes,¹¹ as measured by the Electricity Distributor
 11 Scorecard (“EDS”) and Electricity Service Quality Requirements (“ESQRs”) outlined in
 12 Exhibit 1B, Tab 3, Schedule 2. Each OM&A program enables outcomes that Toronto Hydro

¹⁰ Toronto Hydro estimates that its market share for suite metering new multi-unit buildings is now approximately 30 percent, compared to approximately 70 percent in 2013.

¹¹ Renewed Regulatory Framework for Electricity Distributors: A Performance-Based Approach, (October 18, 2012), at page 57.

1 expects to be attained as a result of the proposed investment and are categorized into
2 the four outcome categories under the RRF; namely, Customer Focus, Operational
3 Effectiveness, Public Policy Responsiveness, and Financial Performance.¹² This approach
4 underscores the customer value generated by the proposed OM&A programs.

5

6 Over the last decade, Toronto Hydro managed operational funding efficiently, as further
7 discussed below, while delivering notable improvements in service quality and other
8 performance metrics for its customers. For example, Toronto Hydro improved its
9 performance on first contact resolution, a key measures of customer experience and
10 satisfaction, from 77 percent in 2013 to 92 percent in 2022. Similarly, the utility improved
11 connections-related performance, as measured by the metric New Residential and Small
12 Business Services Connected on Time, from 94 percent in 2013 to 99 percent in 2022.¹³

13

14 Over the 2025-2029 rate period, Toronto Hydro intends to maintain these performance
15 improvements and make targeted improvements in other areas such as: (i) strengthening
16 protection against physical and digital security threats, (ii) improving efficiency outcomes
17 through the use of non-wires solutions to avoid or defer the need for traditional capital
18 investments, and (iii) strengthening resilience through proactive investments in modern
19 grid technology as outlined in the Grid Modernization Strategy in Exhibit 2B, Section D5.
20 These and other key performance objectives are outlined in Toronto Hydro's 2025-2029
21 Custom Scorecard in Exhibit 1B, Tab 3, Schedule 1.

¹² The outcomes listed in each program are directly connected to, and dependent on, the forecasted funding needs for the program. Any change in overall rates funding for the term of the plan would require Toronto Hydro to reforecast cost allocation to each program and re-examine the corresponding outcomes.

¹³ Please refer to Exhibit 1B, Tab 3, Schedule 2 for more information about the utility's historical performance.

1 The OM&A programs detailed in Exhibit 4, Tab 2 work together with the capital programs
2 outlined in Exhibit 2B, Section E to enable the achievement of the key performance
3 commitments across four areas of performance in the 2025-2029 Custom Scorecard: (1)
4 System Reliability and Resilience; (2) Customer Experience and Service; (3) Environment,
5 Safety, and Governance; and (3) Efficiency and Financial Performance. Investments in
6 operational programs as detailed herein and importantly, the resources that underpin
7 these programs, are essential to meeting the performance targets outlined in Exhibit 1B,
8 Tab 3, Schedule 1.

9

10 **2. Productivity & Benchmarking**

11 Using publicly available data,¹⁴ the historical benchmarking analysis presented in this
12 section demonstrates that Toronto Hydro (i) has a lean workforce compared to its Ontario
13 peers and (ii) is a strong OM&A cost performer compared to other large and mid-sized
14 distributors in the province.¹⁵ Toronto Hydro's efficient OM&A and staffing cost
15 management to date positions the utility well to address a growing need for investments
16 in operations and resourcing without creating undue cost burdens and rate increases for
17 customers in the next rate term.

18

19 **2.1 OM&A Metrics**

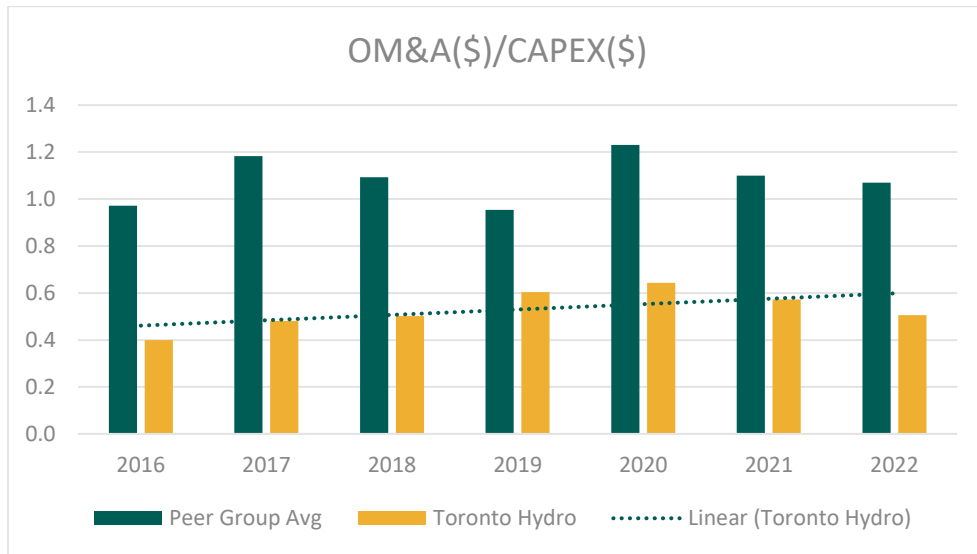
20 Figures 3 and 4 below compare OM&A expenditures against capital expenditures and
21 system load (MWh), respectively, over the 2016 to 2022 period for Toronto Hydro and
22 the identified distributor peer group. When comparing OM&A expenditures to capital

¹⁴ Using publicly available data that utilities including Toronto Hydro reported to the OEB under the Electricity Reporting and Record Keeping Requirements ("RRR").

¹⁵ The peer group consists of the large and mid-sized Ontario distributors: Hydro One, Hydro Ottawa, Alectra Utilities, Elexicon Energy, London Hydro, EnWin Utilities, and Enova Power. With the exception of Elexicon and Hydro One, these distributors serve the top 10 cities in Ontario (by population size). Hydro One was included in the peer group because it serves approximately 90 percent of the service territory in the province, and Elexicon Energy was included because it is the fourth largest municipally owned electricity distributor in the province.

1 expenditures (Figure 3), Toronto Hydro spends considerably less OM&A relative to capital
2 in comparison to the peer group, in many years showing an OM&A-to-CAPEX ratio of less
3 than half that of the peer group. Toronto Hydro's OM&A per MWh of load (Figure 4) is
4 more comparable to that of other large distributors, but remains lower than that of the
5 peer group for all years analyzed.

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Figure 3: OM&A relative to Capital Expenditures

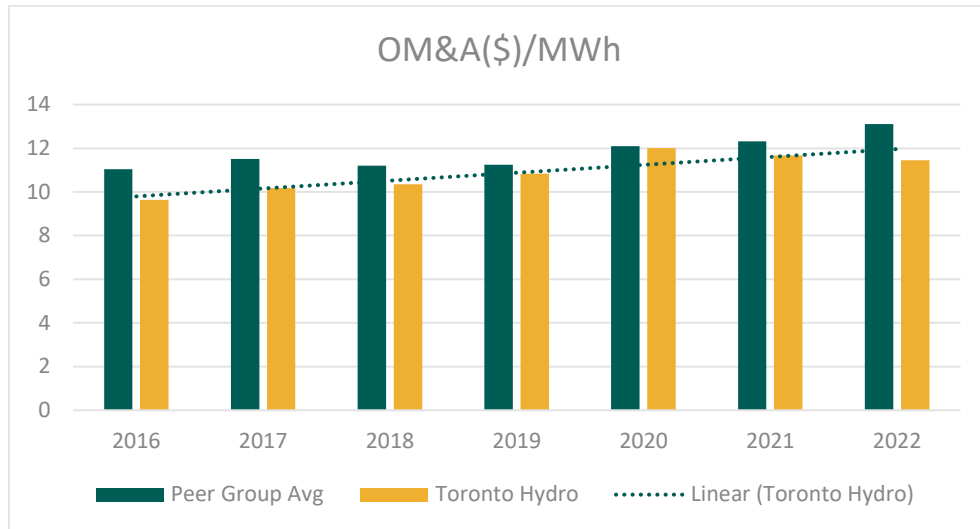


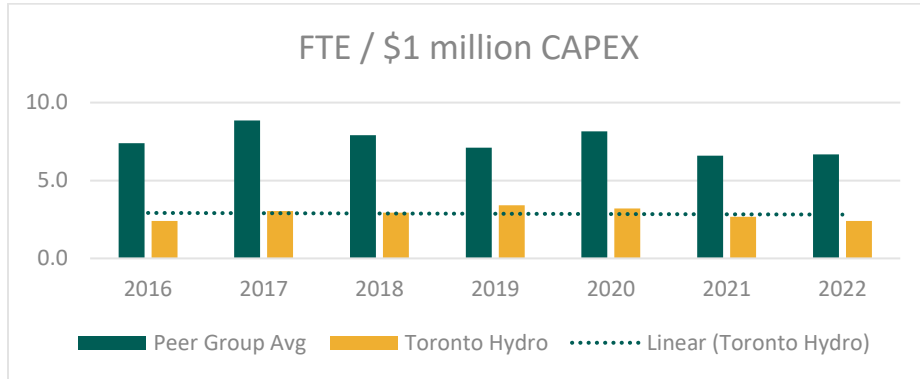
Figure 4: OM&A Expenditure per MWh of Load

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2.2 FTE Metrics

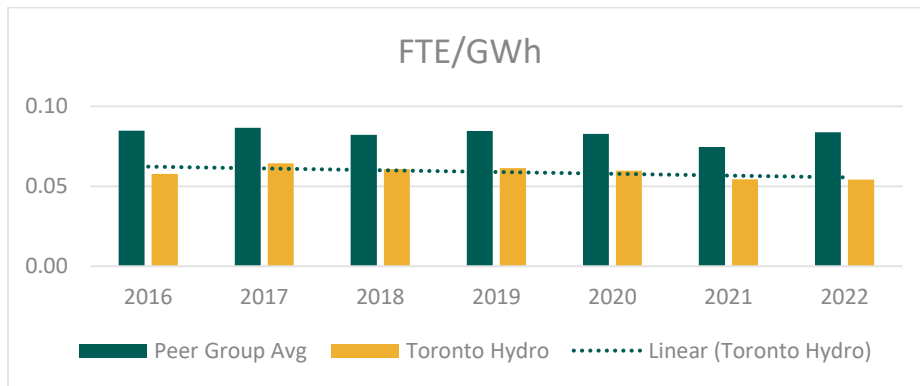
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3 Figures 5, 6, and 7 below compare total FTEs against capital expenditures, load (GWh),
 4 and circuit-km over the 2016 to 2022 period for Toronto Hydro and the identified
 5 distributor peer group. Toronto Hydro has a considerably lower FTE per \$1 million in
 6 capital expenditures relative to the peer group, staffing an average of 2.86 FTE per \$1
 7 million in capital expenditure, compared to an average of 7.5 FTE for the peer group.
 8 Similarly, there is a noticeable gap between Toronto Hydro and the peer group with
 9 respect to the number of FTEs per GWh of load and per circuit-km.



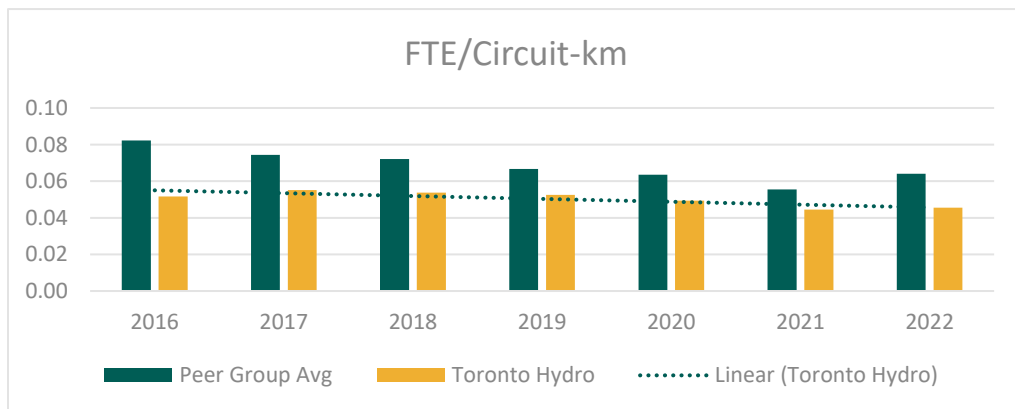
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Figure 5: FTE per \$1 million Capital Expenditures



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Figure 6: FTE per GWh of Load

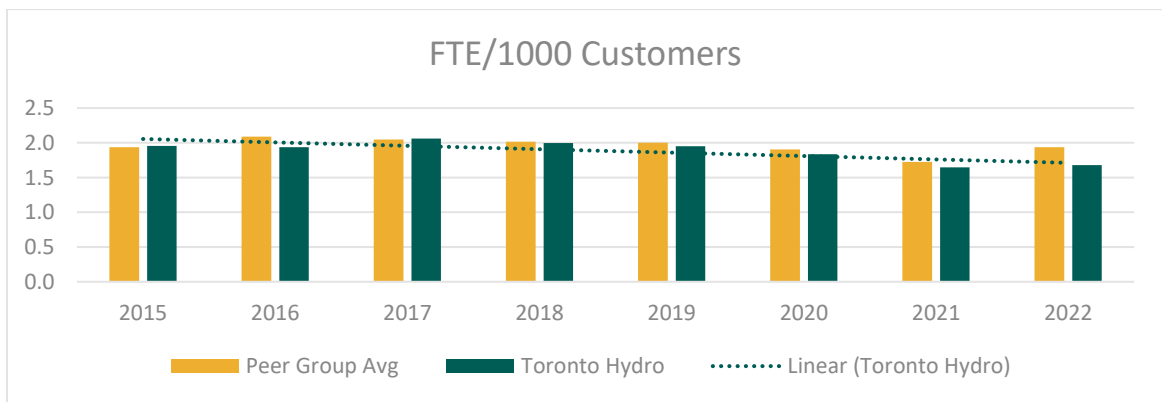


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Figure 7: FTE per Circuit-Km

1 **2.3 Customer Metrics**

2 Figures 8, 9, and 10 below compare FTEs, OM&A expenditures, and MWh of load relative
 3 to customer count over the 2016 to 2022 period for Toronto Hydro and the identified
 4 distributor peer group. Subject to the practical caution articulated above in subsection
 5 1.1.2, customer metrics provide another tool for assessing Toronto Hydro’s performance
 6 against its peers. With respect to FTE per customer, Toronto Hydro’s staffing is consistent
 7 with or better than the peer group. At first glance, Toronto Hydro appears slightly
 8 “behind” the average of other large Ontario distributors when examining OM&A per
 9 customer, but closer examination shows that Toronto Hydro requires more system
 10 capacity, more assets and hence more resources per customer than other large or mid-
 11 size distributors in Ontario. In part, this is driven by Toronto Hydro customers serviced
 12 behind bulk meters, which skews the evaluation of performance against customer count.
 13 Examination of MWh of load relative to customer count demonstrates this reality, with
 14 Toronto Hydro providing an average of 31.8 MWh per customer, approximately 35
 15 percent more load per customer relative to the peer group multi-year average of 23.6
 16 MWh.



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Figure 8: FTE per 1,000 Customers

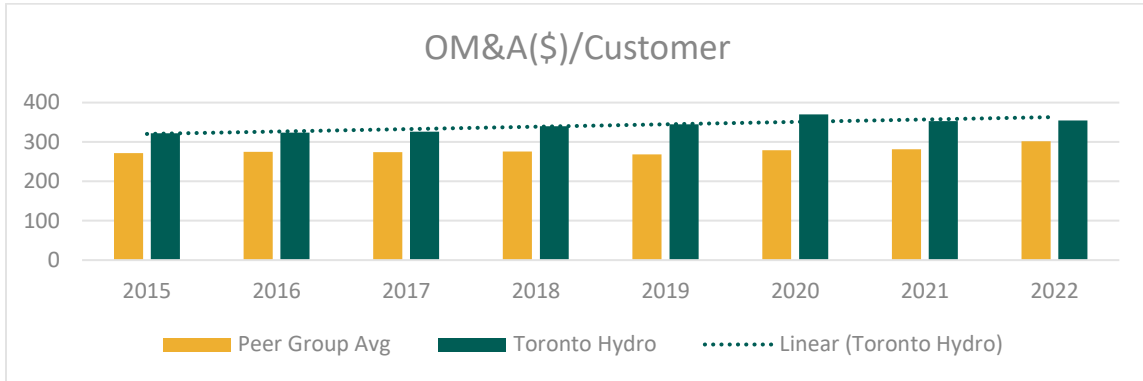


Figure 9: OM&A Expenditure per Customer

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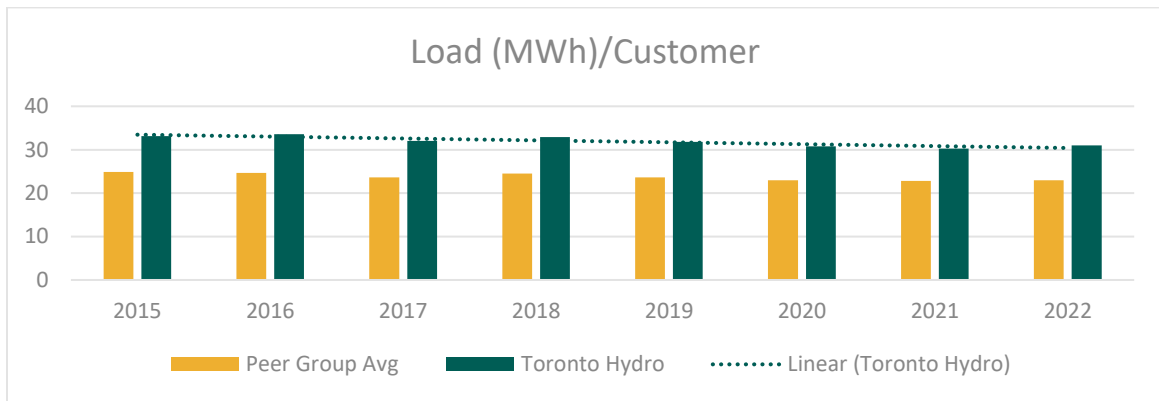


Figure 10: MWh of Load per Customer

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3. WORKFORCE NEEDS AND CHALLENGES

5

6 With compensation costs representing a large portion of the utility's 2025-2029 OM&A
 7 budget, the need for resources and the ability to fund prudent costs to attract and retain
 8 those resources is the biggest driver of the multi-year OM&A need.

9

10 Figure 11 below shows the overall profile of Toronto Hydro's FTEs from 2015 to 2029,
 11 consistent with data provided in the current and previously filed iterations of Appendix
 12 2-K, which excludes students as they are temporary resources.

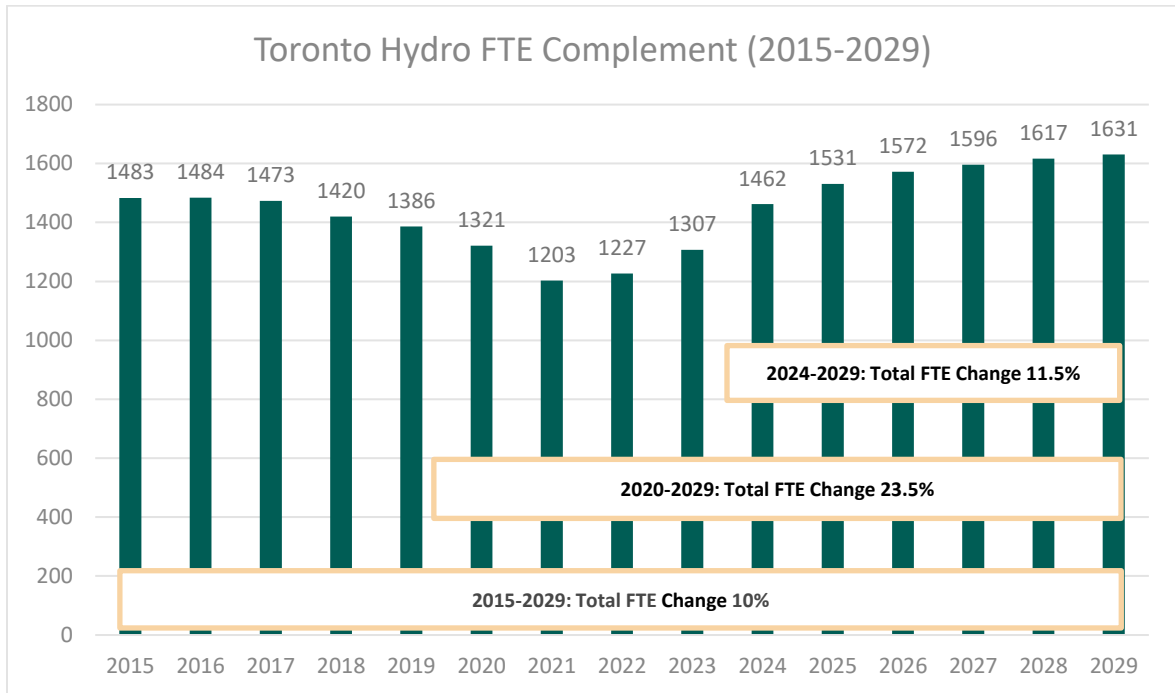


Figure 11: 2015-2029 FTE Complement (Appendix 2-K)

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14

From 2015 to 2029 Toronto Hydro expects total FTEs to increase by 10 percent. This FTE count overlays a period of time in which Toronto Hydro’s annual capital expenditure plan is growing by roughly 70 percent, while the customer count is expected to grow by approximately 8.5 percent, including the addition of larger and more complex customers such as data centres and transit systems. A growing customer base and expanding capital program both place constraints on staff resources, with distinct tasks increasing in volume as the utility serves more (and larger) customers and executes more individual capital projects.

In the 2020-2024 rate application (EB-2018-0165), Toronto Hydro brought forth a workforce plan that was responsive to the circumstances of the day, being a more stable and linear operating environment. Despite significant disruption caused by the COVID-19

1 pandemic, the utility expects to successfully implement its resource plan over the current
2 rate period. However, fundamental shifts have taken place since EB-2018-0165 which
3 have material implications for Ontario’s energy sector and Toronto Hydro’s business, and
4 require responsive action over the 2025-2029 rate period.

5

6 As the worst of the COVID-19 pandemic subsided, customers, governments, and markets
7 began to coalesce around a need to accelerate the energy transition to mitigate the
8 existential and economic impacts of climate change. Fueled by technology trends
9 including the declining cost of solar photovoltaic and battery technologies, government
10 policies encouraging climate action, and financial markets driving a greater focus on ESG
11 imperatives, customer needs and expectation for electricity are rapidly evolving. As
12 customers electrify previously non-electric energy uses (e.g. transportation, heating) and
13 increase participation in clean energy production and management, these actions will
14 have fundamental long-term implications for Toronto Hydro and its system, including—
15 but not limited to—being ready to serve a future demand for electricity that is expected
16 to roughly double over the next two decades.¹⁶

17

18 Given its fundamental obligation to connect customers who want to access the
19 distribution grid, Toronto Hydro cannot enter this period of significant change
20 unprepared to handle increased demand and consumption, bi-directional power flows,
21 increased societal reliance on electricity, and enhanced customer expectations that
22 naturally flow from these evolutions. Due to the long lead time required for investment
23 in both grid and human capital, to meet these needs Toronto Hydro must begin work
24 today to be prepared for an accelerated energy transition in the next decade.

¹⁶ As shown in the Future Energy Scenarios report filed at Exhibit 2B, Section D4, Appendices A and B.

1 Toronto Hydro’s response to changing circumstances began in earnest in 2022 after
2 COVID-19 related disruptions in 2020 and 2021 brought its staffing contingent to a low
3 point of 1,203 FTEs in 2021. As seen in the Employee Costs and Compensation Table
4 (Appendix 2-K) filed in Exhibit 4, Tab 4, Schedule 2, from 2022 through 2023 Toronto
5 Hydro has been primarily “catching up” to the staffing levels projected in the 2020-2024
6 rate application. Yet, because the external environment has changed, these catch-up
7 efforts are also a foundational step towards a future-ready plan that includes investments
8 in resourcing capacity (headcount) and capabilities (enhanced skills) that are necessary to
9 deliver the 2025-2029 DSP and key outcomes outlined in Exhibit 1B, Tab 3, Schedule 1.

10

11 As Toronto Hydro prepares to enter its next rate period, staffing levels are forecasted to
12 grow by 25 percent over the 2024 through 2029 period. Due to the necessity of long lead
13 time investments in human capital (see below), this growth is higher in the beginning
14 years and more gradual over the rest of the period, focused on scaling teams that require
15 additional resources and expanded skills to plan, design and execute capital and
16 operations work programs.

17

18 Just as it takes years to build new transformer station or convert an area of the city served
19 by legacy infrastructure to modern standards, human capital investments require long
20 lead times, with the average employee undergoing two years training and development
21 before becoming a fully competent contributor due to the specialized nature of the skills
22 and experience required to work in this sector. For certain trades, it takes anywhere from
23 four and a half to six and a half years to train a new certified and skilled tradesperson,
24 plus a minimum additional one to two years to develop a new frontline leader post-
25 apprenticeship.

1 Toronto Hydro often hires capable, but relatively inexperienced employees, with the
2 intention to develop them in-house through on-the-job training and mentoring by
3 tenured staff who can ensure effective knowledge and skill transfer to the next generation
4 of employees. Combining this practice with continued pace of baby-boomer retirements,
5 Toronto Hydro’s workforce has an average age of 40, having declined by 14 percent over
6 the last decade.

7

8 A key part of Toronto Hydro’s talent strategy is a trade school for field trades such as
9 Power Line Technicians and Distribution System Technologists to develop them from
10 apprentices to journeypersons. This talent strategy is fuelled by partnerships with
11 colleges and universities for direct recruiting and collaborative curriculum building. The
12 relationships with academic institutions extend to other areas of technical expertise,
13 including engineers, engineering technologists and technicians, computer systems
14 developers and programmers, software developers and programmers, cyber security
15 specialists, database analysts, data administrators, accountants, lawyers, and human
16 resources (“HR”) professionals. The utility’s development program ensures it has both a
17 strong workforce today and a healthy pipeline of talent for the future.

18

19 An expanded workforce means that compensation costs must also increase to keep pace.
20 From 2024 to 2029, as the utility’s workforce grows by approximately 11.5 percent, total
21 compensation expenses are expected to increase by compound annual growth rate of ■■■
22 percent. Total cash compensation per FTE is forecast to increase at rate of ■■■ percent
23 over the 2020 to 2029 period, consistent with economic assumptions in section 4.2.6 and
24 in the Compensation evidence.¹⁷ The Mercer compensation benchmarking study filed at
25 Exhibit 4, Tab 4, Schedule 5 and similar benchmarking studies filed in past rate

¹⁷ For more information about Compensation costs please refer to Exhibit 4, Tab 4, Schedule 4.

1 applications affirm that Toronto Hydro’s compensation philosophy continues to deliver
2 good value for the utility and its customers, concluding that Toronto Hydro’s total
3 compensation is positioned within a market competitive median.

4

5 **4. Business Planning**

6 This section describes Toronto Hydro’s business planning process to arrive at the
7 operational plan summarized in this schedule and detailed throughout Exhibit 4.

8

9 **4.1 Planning Process**

10 Toronto Hydro leveraged its established integrated business planning process to produce
11 a 2023-2029 operational plan that enables the delivery and complements the priorities
12 and outcomes of the capital plan, while maintaining the safety and reliability of the
13 distribution system, enabling non-wires solutions, enhancing customer experience in
14 accordance with broader societal trends, keeping the utility abreast of all applicable
15 policy, legislative, and regulatory developments, and equipping support functions with
16 the tools and resources required to enable these outcomes.

17

18 As discussed in Exhibit 2B, Section E2, Toronto Hydro began its business planning process
19 in 2022 by obtaining feedback about customers’ needs and priorities with respect to the
20 2025-2029 planning period (Phase 1 Customer Engagement).¹⁸ Customers expressed that
21 price, reliability, and investing in new technology are their top priorities, with reliability
22 increasing in relative importance compared to previous engagements. Customers also
23 expressed that they expect Toronto Hydro to invest in system capacity to ensure that
24 growth does not decrease reliability and to support their electrification objectives. This

¹⁸ For more detailed information about the Customer Engagement process that Toronto Hydro followed, please refer to Exhibit 1B, Tab 5, Schedule 1.

1 feedback enabled Toronto Hydro to develop a capital plan organized around four
2 investment priorities: 1) Sustainment and Stewardship; 2) Modernization; 3) Growth; and
3 4) General Plant.

4

5 The utility used customer feedback, along with other business and technical inputs such
6 as asset health demographics, system constraints, safety and environmental risk
7 assessments, business conditions and risks, legislative and regulatory requirements, cost
8 inputs for materials, and labour and external services, to produce the capital and system
9 maintenance plans through the Investment Planning and Portfolio Reporting (“IPPR”)
10 process described in Exhibit 2B, Sections D1 and D3.

11

12 Following the development of the capital and maintenance plan, the utility determined
13 the workforce complement, external services, equipment, materials, and other
14 operational resources that it will need to execute the capital plan and keep up with
15 growing customer requirements, changing technologies, and evolving policy
16 expectations. Through a series of iterative engagements between operational leaders,
17 system planners, and specialists from support services such as Finance and Human
18 Resources, Toronto Hydro produced an operational plan (inclusive of workforce
19 requirements) that was integrated with the capital and maintenance plans.

20

21 As further detailed in Exhibit 2B, Section E2, to guide the development of the plan in a
22 way that balances price and service quality outcomes, Toronto Hydro set a strategic
23 planning direction which included a price limit of 7 percent per year on the average annual
24 distribution rate increase for residential customers. This price limit translated into an
25 upper budget limit of \$1.9 billion for the operational plan over the 2025-2029 rate period.

1 Various iterations and refinements took place over the course of planning process, as
2 leaders across the organization worked cross-functionally to align, optimize, and stress-
3 test capital and operational expenditure levels to ensure compatibility between
4 objectives and strike balance between price and service quality outcomes. These
5 engagements produced a multi-year workforce plan which aims to ensure that Toronto
6 Hydro has the necessary capacity (headcount) and capabilities (skillsets) to execute the
7 investment plan.

8

9 Once a draft plan was produced that aligned with the strategic planning direction,
10 Toronto Hydro took the draft plan back to customers for feedback via a comprehensive
11 customer engagement process (Phase 2), whereby customers provided input on seven
12 key investment options, by indicating their preferences on whether to increase, maintain,
13 or reduce the pace of investment, and the specific trade-offs between price and other
14 outcomes for each area. The utility used the results of the Phase 2 Customer Engagement,
15 as well as other salient information such as 2022 year-end actual data, to finalize the
16 capital and operational plans. The assumptions underpinning the operational plan,
17 including the headcount plan, were refined alongside the capital plan, resulting in the
18 \$1,856 million OM&A plan summarized in this schedule and detailed in Exhibit 4, Tab 2.

19 **4.2 Planning Inputs**

20 Toronto Hydro relied on a broad variety of inputs to ensure that its operational plan aligns
21 and supports the priorities of the capital plan, and delivers customer-valued outcomes,
22 while prudently controlling costs. In producing the operational plan, the utility applied an
23 inflationary increase approach to existing budgets and then layered on incremental
24 requirements and priorities derived from the planning inputs summarized below.

1 **4.2.1 Customer Needs and Priorities**

2 Toronto Hydro's operational plan for the 2025-2029 rate period was informed by
3 extensive application-specific, as well as ongoing customer engagement activities
4 undertaken in the normal course of business. As discussed briefly in section 4.1 above and
5 in greater detail in Exhibit 1B, Tab 5, Schedule 1, the utility undertook a two-phase
6 application-specific customer engagement to learn about customers' needs and priorities
7 to build a draft plan that is responsive to those needs and priorities, and obtain customer
8 feedback on the draft plan across key investment areas. The plan is also informed by
9 extensive ongoing customer and stakeholder engagement activities undertaken in the
10 normal course of business as part of the utility's robust and sophisticated customer
11 research and response model, as described below in section 3 of Exhibit 1B, Tab 5,
12 Schedule 1.

13
14 Ongoing and application-specific research reveals that customer behaviour and attitudes
15 are evolving, and there is a shift in terms of customers needs and priorities. These include:

- 16 • Reliability and investment in new technology have become increasingly important
17 to customers, and are almost on par with price.
- 18 • Customers are looking for information to improve their understanding of climate
19 change, decarbonization and electrification, as well as an understanding of
20 Toronto Hydro's role in these initiatives, while at the same time looking for
21 opportunities to reduce their overall energy costs.
- 22 • Many customers have strong expectations for Toronto Hydro to commit to
23 environmental initiatives and lessen environmental impact.
- 24 • Customers have evolving communication preferences – email is the preferred
25 method of contact for all communications and younger Torontonians, in
26 particular, have above-average preference for SMS communications.

- 1 • Customers have shown more concern for the future of the electricity system and
2 the grid than in past years.

3

4 As key sectors of the economy shift towards electrification, the volume and complexity of
5 customer needs and inquiries are expected to increase. Toronto Hydro’s customer
6 response model is becoming more efficient at understanding and responding to customer
7 requirements quickly, and improving customers’ self-service experience through the
8 introduction of various self-service tools (such as an improved online self-service portal
9 and a new mobile application). Yet, the utility needs more resources with the necessary
10 knowledge and skills to maintain an agile and robust customer research and response
11 model as the energy transition unfolds. The 2025-2029 operational plan reflects Toronto
12 Hydro’s drive to meet these needs in the next rate period and beyond.

13

14 **4.2.2 Asset Maintenance Requirements**

15 Toronto Hydro determines asset maintenance requirements, including system response
16 and customer-driven work activities, through its annual Investment Planning and
17 Portfolio Reporting (“IPPR”) process, detailed in Exhibit 2B, Sections D1 and D3 whereby
18 the utility: (i) establishes asset management policies, goals, and objectives, as informed
19 by corporate strategies and customer needs, expectations, and feedback; (ii) assesses the
20 current state of assets based on asset demographics and condition; (iii) identifies the
21 required expenditure levels to manage risk and achieve intended outcomes; and (iv)
22 tracks execution status and expenditures to inform future projects.

23

24 Toronto Hydro also considers asset management and maintenance considerations for
25 general plant infrastructure, namely vehicle fleet, facilities, and IT assets and systems,
26 which serve as the backbone for all capital and operational programs. The safe, reliable,

1 and efficient operation of these assets is crucial to Toronto Hydro’s successful and cost-
2 effective delivery of the outcomes expected by customers and mandated by the OEB, and
3 the protection of the distribution grid from physical and digital threats.

4 5 **4.2.3 Workforce Requirements**

6 Toronto Hydro’s leaders identified the workforce needs to execute work in their programs
7 in terms of both capacity (i.e. headcount) and capabilities (i.e. skillsets). This included
8 consideration of Toronto Hydro’s hiring plans that were already in place but had been
9 delayed in implementation due to the COVID-19 pandemic. In this regard the utility
10 prioritized resourcing in a number of key areas of the plan, which are discussed in further
11 detail in section 5.1. These areas include:

- 12 • Resources to support modernization objectives across a number of portfolios,
13 including System Planning, Control Centre, and Information Technology.
- 14 • Staff in customer-interfacing functions such as Customer Connections, Key
15 Accounts, Customer Care, and Community and Public Relations to align with
16 growing volumes of work and increasing service expectations in these portfolios.
- 17 • Skilled trades, and technical and other resources in work program execution-
18 related functions to enable the delivery of a larger capital program, including back-
19 end support functions such as Supply Chain, Finance, and Legal Services.

20 21 **4.2.4 Legislative and Regulatory Obligations**

22 The 2020-2024 rate period saw a significant increase in the volume of legislative and
23 regulatory requirements and policy engagements emanating from the Government of
24 Ontario, the OEB, and the IESO. Examples include major infrastructure policy initiatives
25 embodied in legislation such as the *Building Transit Faster Act, 2020*, the *Building*
26 *Broadband Faster Act, 2021*, and the revised *Ontario Underground Infrastructure*

1 *Notification System Act, 2012*, consumer-oriented initiatives such as the Ultra Low
2 Overnight TOU rate¹⁹ or Green Button,²⁰ and 10 rounds of amendments to OEB codes and
3 28 OEB Staff Bulletins to give effect to these and other requirements. Examples of policy
4 engagements include the Framework for Energy Innovation, the Reliability and Power
5 Quality Review, Electric Vehicle Integration, and Distribution Sector Resilience,
6 Responsiveness & Cost Efficiency.²¹ These requirements and engagements have added
7 to volumes of work for both Toronto Hydro's legal and regulatory professionals and
8 operational business units implementing the relevant outcomes, generating additional
9 business processes that will last into the 2025-2029 rate period.

11 **4.2.5 Internal and External Benchmarking**

12 Toronto Hydro also relied on comparative analyses, as detailed in section 2 above, and
13 expert benchmarking studies to situate the utility's historical performance and future
14 expenditure plans with comparable peers across various jurisdiction and operational
15 areas. These studies are summarized in Exhibit 1B, Tab 3, Schedule 3.

17 **4.2.6 Economic Assumptions**

18 Toronto Hydro used both general and specific cost and economic assumptions in its
19 forecast of 2025-2029 OM&A costs. In preparing its 2023 to 2029 forecasts, Toronto
20 Hydro considered, and the forecasts reflect, the following inputs: (i) Toronto Hydro's
21 obligations under collective agreements, (ii) relevant labour market data (where
22 available),²² and (iii) the utility's projections of outcomes of future rounds of collective

¹⁹ Ontario Regulation 633/21 under the *Electricity Act, 1998* SO 1998 c. 15, Sched A.

²⁰ Ontario Regulation. 95/05 under the *Ontario Energy Board Act, 1998* SO 1998 c. 15, Sched B.

²¹ EB-2021-0118, EB-2021-0307, EB-2023-0071, and EB-2023-0003, respectively.

²² For example, the results of Mercer Canada's *August 2023 QuickPulse™ Canada Compensation Planning Survey* show total salary increases of 3.7 percent, online: <<https://www.imercer.com/ca/ARTICLEDETAIL/annual-increase-budget-canada>>

1 bargaining that will take place throughout the forecast period. [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

[REDACTED] For more information on compensation costs, see Exhibit 4, Tab 4,
7 Schedules 2 and 4. Otherwise, a general inflation factor of 2.0 percent was applied,
8 consistent with the Bank of Canada’s economic outlook to return the economy to stable
9 inflation by 2025.²³

10

11 **5. KEY DRIVERS**

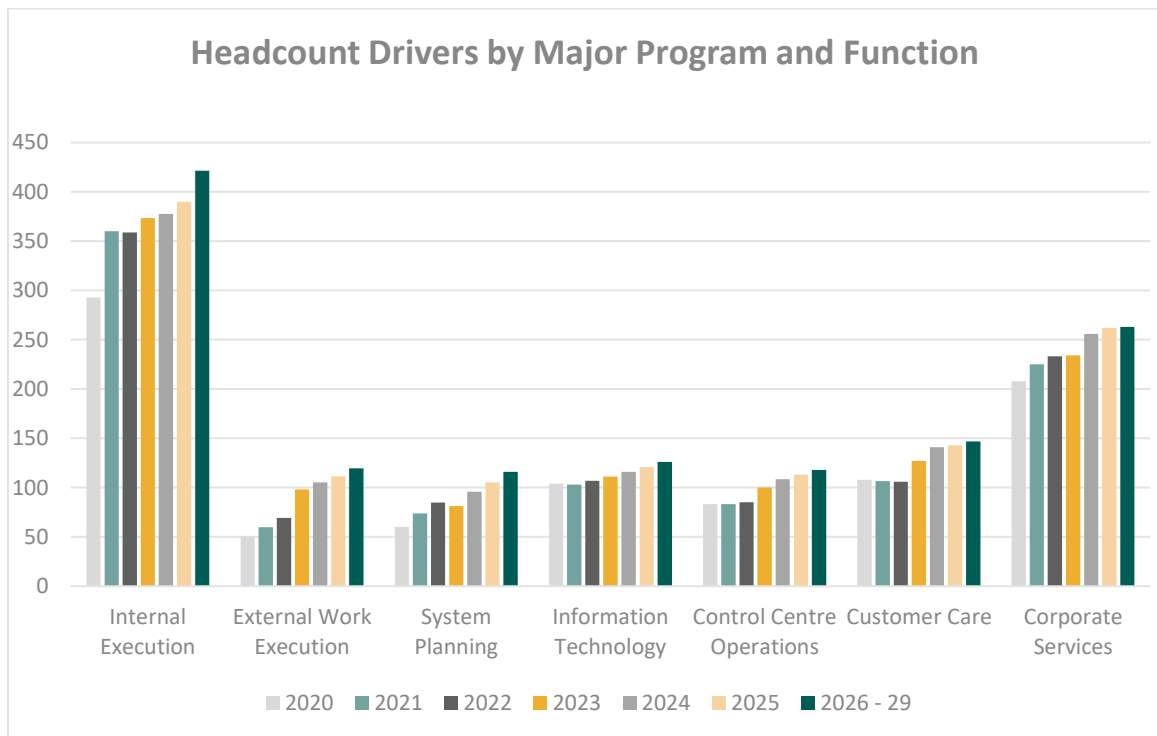
12 **5.1 Staffing**

13 As further described below, the execution of increased volumes of work is a key driver of
14 the workforce requirements across a number of functions and roles within the utility’s
15 operations, which are summarized herein and further detailed in the underlying
16 programmatic evidence. The challenge of increasing volumes of work is further
17 compounded by more complex workloads. Priorities such as grid modernization,
18 increased receipt and use of data, pursuit of non-wires solutions to defer or displace the
19 need for traditional infrastructure, intensifying cyber security threats, and increased
20 connection and management of distributed energy resources, all add to the complexity
21 of work completed by Toronto Hydro staff. Some of these developments have created
22 situations of incremental workload for Toronto Hydro staff relative to historical status
23 quo, while others have increased the complexity of existing tasks. These workloads
24 ultimately produce better outcomes for customers through provision of safe and reliable

²³ *Supra* note 5.

1 service, while relying on a more intelligent grid with enhanced capabilities to manage
 2 outages and handle two-way power flows.

3
 4 Figure 12 below highlights material areas of growth in Toronto Hydro’s workforce plan,
 5 with implications for OM&A funding required over the 2025 to 2029 rate period. The
 6 sections that follow address each of these areas, articulating the specific workload
 7 requirements that drive the need for incremental staffing.



8 **Figure 12: 2020-2029 Headcount Drivers by Major Program and Functions²⁴**

9
 10 The key areas of investment in incremental resources are summarized as follows:

²⁴ Figure 12 is aligned with Appendix 2-K (Exhibit 3, Tab 4, Schedule 2) in that it excludes students, which are temporary resources.

- 1 • **Internal Work Execution:** Increases to the complement of Certified and Skilled
2 Trades critical to the execution of Toronto Hydro’s capital and operations
3 programs, including the utility’s Grid Modernization Strategy, at a pace that allows
4 for the extended lead-time required to safely train new workforce entrants.
- 5 • **External Work Execution:** Increases to the number of contract managers and
6 project management staff to ensure the utility is able to effectively manage
7 external contractors as the capital program grows.
- 8 • **System Planning:** This segment is driven by the amount of capital (system access,
9 renewal, and service) and maintenance work, and associated scopes of work that
10 must be developed. Additional resources are required to analyze distribution
11 system performance and needs, develop the utility’s asset management strategy,
12 develop the utility’s grid modernization plan, manage record keeping and develop
13 the DSP and scopes of work for executing the DSP.
- 14 • **Control Centre Operations:** As more distribution assets and DERs are connected
15 to Toronto Hydro’s grid and the utility modernizes system operation through the
16 implementation of advanced grid management systems and more sophisticated
17 data analysis and automation, this program will require more staff, both to handle
18 increasing volumes of work and acquire specialized skills and knowledge made
19 necessary by the evolution of Control Centre operations to support the Grid
20 Modernization Strategy and Non-Wires Solutions program.
- 21 • **Information Technology:** The utility will need a robust staffing complement to
22 effectively manage core business IT processes, as well as cyber security
23 enhancements, cloud implementation, and major IT projects.
- 24 • **Customer Care:** Additional workers skilled in data analytics are required to enable
25 the utility to respond to more complex customer inquiries, implement and
26 optimize automated call centre quality management, powered by artificial

1 intelligence and machine learning technologies, as well as gain insights on
2 customer behaviour in interacting with the increasing number of communication
3 channels (e.g. live chat and mobile application).

- 4 • **Corporate Services:** Financial professionals administering the utility’s financial
5 and accounting records and process will need to keep pace with the increasing
6 volume of work; Higher work volumes (such as offers to connect), evolving legal,
7 regulatory and policy requirements and changing business conditions necessitate
8 highly-skilled and experienced staff to address legal, regulatory and public affairs
9 matters; and the utility’s talent acquisition, management, and retention services,
10 compensation, and performance management frameworks will need to oversee
11 the human resources needed to execute Toronto Hydro’s investment plan.

12 13 **5.1.1 External Work Execution**

14 As further described in Exhibit 4, Tab 2, Schedule 10, the External Work Execution
15 segment administers and oversees capital and maintenance work performed by external
16 contractors and is the primary point of contact between Toronto Hydro and external
17 contractors. The tasks completed by this group include evaluating and administering
18 competitive tenders for contractor services, providing oversight of the resulting contracts,
19 and administering support of the specific projects assigned to external contractor crews,
20 such as: job package development and issuance; liaising with system planners to address
21 specific design matters; field issues management; liaising with customers directly and
22 through the community relations team; ordering materials; facilitating changing of
23 project scopes; monitoring contractor safety practices; invoicing and receipting; and
24 inspection of newly constructed assets.

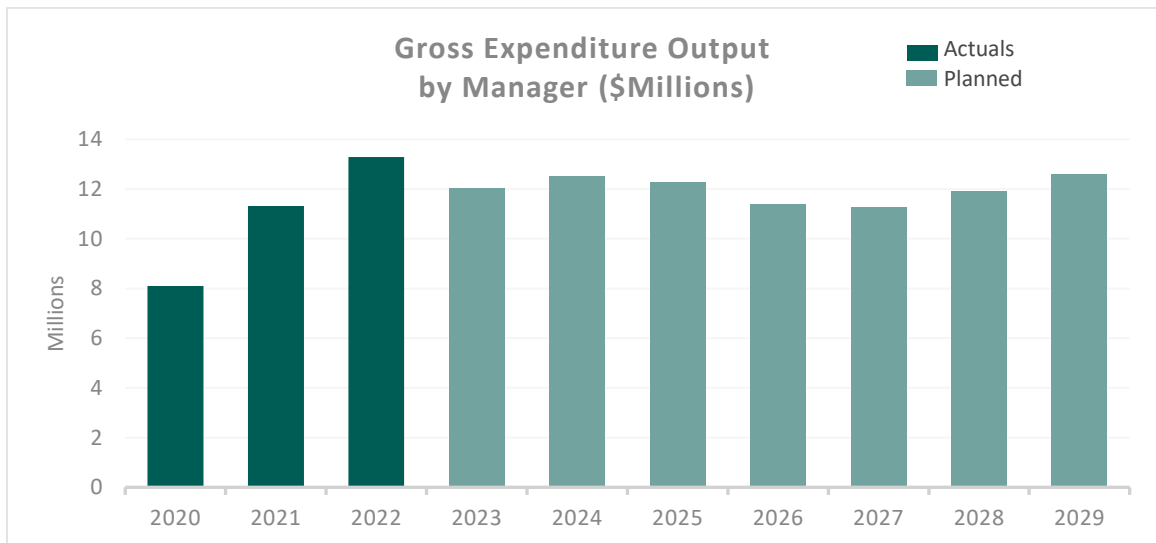
1 Given the nature of the workload completed by the External Work Execution segment,
2 Toronto Hydro must increase the number of contract managers and project management
3 staff to ensure the utility is able to effectively manage external contractors as the capital
4 program grows. From the end of 2022 to 2029, Toronto Hydro intends to increase
5 resourcing in this area by 74 percent from 69 to 120 staff. In Toronto Hydro's experience,
6 an appropriate resource level has each manager, with a supporting analyst, executing
7 approximately \$11 to 13 million in capital projects annually. As shown in Figure 12,
8 Toronto Hydro's plan ensures sufficient resources to support these execution levels.

9 If Toronto Hydro were forced to deliver this segment with a reduced level of funding over
10 the 2025-2029 rate period, the utility would face execution risks due to a smaller
11 contingent of frontline managers, analysts, and other staff being required to manage a
12 larger capital portfolio per employee; allowing staff significantly less capacity to tend to
13 the needs of each individual project relative to best practice and historical norms. These
14 execution risks include a slower pace of work, compromises from quality and less time for
15 internal coordination across projects.

16

17 A decrease in External Work Execution resources would slow the pace of execution,
18 jeopardizing the completion of required and planned capital projects. Reduction in the
19 number of projects being executed in a given year would put renewal of assets and
20 upgrade or expansion of the distribution system at risk. This would introduce the risk of
21 reduced reliability due to aged assets or the inability for customers (residential and
22 business) to expand as needed to accommodate growth and/or energy conversion for
23 climate action purposes. A decrease in resources may also result in less time available per
24 project. This could lead to less capacity to ensure best practices are followed, and may
25 compromise customer experience in terms of reliability. As well, strained resources and
26 time per projects can lead to reduced time for internal coordination across projects, with

1 less consideration for efficiencies in terms of optimal construction window or
2 calendarization which can lead to lost opportunities for project cost reduction. For
3 example, field manager understaffing may result in inadequate field quality
4 assurance/control during pre-construction. Field managers assist project execution
5 managers with field “walk-downs” prior to construction. Not being able to undertake
6 these may lead to unnecessary delays during construction that could have been identified
7 earlier by a field manager that has years of “hands-on” experience.



8 **Figure 13: Gross Expenditure Output by Manager (\$ Millions)**

9

10 **5.1.2 Internal Work Execution**

11 The Internal Work Execution segment, as described in Exhibit 4, Tab 2, Schedule 10,
12 captures the non-capitalized expenditures associated with work performed by Toronto
13 Hydro’s skilled trades’ apprentices, including the training costs associated with the
14 utility’s trade school which is further described in Exhibit 4, Tab 4, Schedule X. Certified
15 and skilled trades are critical resources in the execution of Toronto Hydro’s capital and
16 maintenance programs. Over time, Toronto Hydro has strengthened the workforce to
17 prepare for retirements and unplanned exits as necessary, and allow for the extended

1 lead-time required to safely train new workforce entrants, considering that apprentice
2 programs run from four and a half to six and half years in length. From the end of 2022 to
3 2029, Toronto Hydro intends to increase resourcing in this area by 17 percent from 360
4 to 421 staff.

5

6 A steady complement of certified and skilled trades is critical to the execution of Toronto
7 Hydro’s capital and operations programs. One of the key areas that certified and skilled
8 Trades will support is Toronto Hydro’s Grid Modernization Strategy (Exhibit 2B, Section
9 D5). This strategy addresses emerging challenges and opportunities arising from
10 electrification, distributed energy resource proliferation, and worsening climate change
11 in a manner that leans first and foremost into the deployment of proven technologies
12 (e.g. reclosers, switches, smart meters, analytics), which will deliver benefits to customers
13 in the near-term (e.g. improved reliability), while laying the foundation for more
14 advanced use cases that will be required in 2030 and beyond. Distribution System
15 Technologists—who operate, install, commission, construct, repair, maintain, and
16 decommission all types of, protective relay and control systems, distribution automation
17 equipment, and SCADA systems—are key to implementing the Grid Modernization
18 Strategy as the equipment and systems installed and maintained by these resources are
19 key components and enablers of the Intelligent Grid that lies at the heart of this strategy.

20

21 If Toronto Hydro were forced to scale back this program to manage within a reduced level
22 of funding over the 2025-2029 rate period, the utility would face a decreased ability to
23 meet legislated training targets, thereby becoming exposed to unnecessary safety and
24 legal risks. Furthermore, reduced investment in the certified and skilled trades enabled
25 by this program would results in notable execution risks with respect to the capital and

1 maintenance plans detailed in this application and beyond, due to lack of support and
2 decrease in recruitment of skilled tradespeople.

3

4 **5.1.3 System Planning**

5 The System Planning segment (Exhibit 4, Tab 2, Schedule 9) enables Toronto Hydro to
6 analyze distribution system performance and needs, develop the utility's asset
7 management strategy, develop the utility's grid modernization plan, develop the DSP and
8 scopes of work for executing the DSP, and manage record keeping. Toronto Hydro
9 intends to increase resources in this area to by 37 percent from 85 to 116 staff between
10 the end of 2022 and 2029. The System Planning segment is driven by the volumes of
11 distribution system capital and maintenance work that the utility needs to plan and
12 design, and associated scopes of work that must be developed. Growth and
13 electrification, system studies and development planning need, and distributed energy
14 resource ("DER") connections will require incremental studies, forecasts, and planning,
15 and the deployment of Intelligent Grid, Energy Storage technologies, and Non-Wires
16 Solutions.

17

18 The work done through the System Planning segment is divided into four functional areas:

- 19 • **The Investment Planning function** undertakes analytical work related to
20 reliability, asset condition assessments, and risk assessment (e.g. environment,
21 safety, customer, and legal claims). This work forms the basis of the development
22 of Toronto Hydro's DSP presented in Exhibit 2B.
- 23 • **The Capacity Planning and Grid Innovation function** is responsible for planning
24 the distribution system's future load requirements driven by customer growth
25 and the requisite connection capacity to accommodate current and forecasted

1 levels of DERs, as well as identifying opportunities for adopting non-wires
2 solutions.

- 3 • **The Integrated Planning and Grid Modernization function** is responsible for
4 facilitating the development, integration, and strategic oversight of Toronto
5 Hydro’s long-term Grid Modernization Strategy, in addition to providing market
6 intelligence and strategic forecasting of future electricity system needs and
7 opportunities, and change management support capacity to help accelerate
8 innovation initiatives.
- 9 • **The Records Management function** involves the maintenance and upkeep of
10 digital records of Toronto Hydro’s distribution system. The utility must maintain
11 up-to-date records to enable efficient and effective system planning and
12 operations.

13
14 If Toronto Hydro were forced to deliver the System Planning segment with a reduced level
15 of funding over the 2025-2029 rate period, the utility could face compliance risks and
16 inefficiencies, including ineffective system planning, inability to manage risks around
17 growth and electrification, failing to maximize benefits of new technologies connected to
18 modernization initiatives, and significant safety and reliability risks if records and data
19 updates are not synchronized with equipment or system configuration changes.

21 **5.1.4 Control Centre Operations**

22 The Control Centre Operations program (Exhibit 4, Tab 2, Schedule 7) facilitates the safe
23 and reliable operation of the utility’s distribution grid through real-time system control
24 and monitoring activities and coordinates system switching and restoration work through
25 the utility’s Control Centre to mitigate the effects of outages on customers and enable
26 safe load transfers for capital and maintenance work. The program also plays a critical

1 role in the integration of both customer-owned and utility-owned DERs into Toronto
2 Hydro’s distribution system, the significance of which will only increase over the 2025-
3 2029 period, as the energy transition takes hold and the utility’s Non-Wires Solutions
4 program expands.²⁵ The Control Centre is also one of the key executors and enablers of
5 Toronto Hydro’s Grid Modernization Strategy²⁶—as the utility adds more distribution
6 assets and modernizes its system operations through more sophisticated data analysis
7 and automation, this program will require more staff both to handle increasing volumes
8 of work and acquire specialized skills and knowledge, made necessary by technologies the
9 utility plans to implement in the 2025-2029 rate period such as Network Condition
10 Monitoring & Control,²⁷ Advanced Metering Infrastructure 2.0,²⁸ Fault Location, Isolation,
11 and Service Restoration,²⁹ and the Advanced Distribution Management System.³⁰

12

13 Toronto Hydro intends to increase resources in this area to by 39 percent from 85 to 118
14 staff between the end of 2022 and 2029. The Control Centre program’s staffing needs is
15 driven by a variety of tasks and business processes such as the volumes of new
16 distribution system operation assets installed in the grid, growth in the volume of DER
17 connections, incremental and more complex system data modelling requirements, and
18 support for the implementation of IT/OT infrastructure projects and internal and external
19 planning and policy engagements.

²⁵ Exhibit 2B, Section E7.2.

²⁶ Exhibit 2B, Section D5.

²⁷ Exhibit 2B, Section E7.3.

²⁸ Exhibit 2B, Section E5.4.

²⁹ Exhibit 2B, Section D5.

³⁰ Exhibit 2B, Section E8.4, Appendix A.

1 For example, as shown in Table 5 below, the number of assets connected to Toronto
2 Hydro’s Supervisory Control and Data Acquisition (“SCADA”) system is going to increase
3 significantly—by over tenfold in some cases—over the 2025-2029 rate period as part of
4 the investments under the Contingency Enhancement segment of the System
5 Enhancements program.³¹

6

7 **Table 5: SCADA-connected Assets**

Asset Type	2020-2024	2025-2029
Switches	33	299
Reclosers	49	220
Feeders for Distribution Automation	15	63

8

9 Similarly, growth in the volume of DERs driven by both Toronto Hydro and its customers
10 more broadly will increase the workload of the Control Centre Operations program. By
11 2029, the expansion of the Non-Wires Solutions program will require the Energy Centre
12 function of the Control Centre to support the procurement of up to 30 MW of capacity
13 under the Flexibility Services initiative (compared to 10 MW in the 2020-2024 period) and
14 manage the operation of nine Toronto Hydro-owned battery energy storage systems
15 (“BESS”) (compared to only one in the 2020-2024 period).³²

16

17 In addition, the utility forecasts total DERs installed on the grid to increase by
18 approximately 67 percent from 2023 to 2029,³³ which is driving investments in the
19 Generation Protection, Monitoring and Control program.³⁴ Each additional device
20 installed in the system pursuant to these programs requires oversight from Control Centre

³¹ Exhibit 2B, Section E7.1.

³² Exhibit 2B, Section E7.2.

³³ Exhibit 2B, Section E3 at page 3.

³⁴ Exhibit 2B, Section E5.5.

1 Operations personnel for: 1) commissioning and testing in the field to reliably
2 communicate with the SCADA system, and 2) daily operations and troubleshooting (e.g.
3 responding to alarms or asset management tasks). Headcount increases in this area are
4 essential to enabling the utility to safely and reliably accommodate these utility- and
5 customer-driven changes to its grid.

6

7 Technological advancements and the modernization of system operation tools is another
8 area that will require the Control Centre Operations program to upskill and enhance its
9 workforce. For example, the advanced applications that Toronto Hydro will adopt as part
10 of the Advanced Distribution Management System (“ADMS”) Upgrade will require the
11 utility to significantly improve data modelling in the Network Management System
12 (“NMS”) to enable the self-healing grid and other automation functions through
13 modernization projects such as Fault Location, Isolation, and Service Restoration
14 (“FLISR”).³⁵ This is because the operation of FLISR will depend on not only traditional types
15 of data relating to connectivity attributes of distribution equipment, but also engineering
16 attributes, such as device limits, impedances, and power transformer data, representing
17 an increase in data point types from 13 to 36. Adequate staffing for the Control Centre
18 Operations program to gather these additional types of data and input them into
19 modelling systems will be essential for the successful and timely implementation and
20 daily operation of modernization initiatives such as FLISR.

21

22 Finally, Control Centre Operations staff act as subject matter experts for a number of
23 internal and external activities. Internally, program staff support investments in cellular
24 SCADA upgrades under the Communication Infrastructure segment of the Information
25 Technology and Operational Technology (“IT/OT”) Systems program, where the expertise

³⁵ Exhibit 2B, Section E8.4, Appendix A.

1 of Control Centre operators is crucial to the timely and reliable completion of critical
2 infrastructure upgrades.³⁶ Externally, Control Centre Operations staff support Toronto
3 Hydro’s participation in industry forums and working groups such as the Electric Power
4 Research Institute (“EPRI”) Distribution Operations & Planning Group,³⁷ and the IESO’s
5 Transmission-Distribution Coordination Working Group.³⁸ The operational expertise that
6 Control Centre operators bring to these engagements benefits both Toronto Hydro, by
7 enabling the utility to expand its knowledge of the industry through connections with
8 stakeholders, and the industry, by contributing to policy design and development with
9 Toronto Hydro’s unique experience as a large urban distributor.

10

11 If Toronto Hydro were forced to deliver work under the Control Centre Operations
12 program with a reduced level of funding over the 2025-2029 rate period, the utility would
13 be unable to resource the critical functions discussed above, resulting in a number of risks
14 relating to the successful execution of capital plans relating to the distribution system and
15 IT/OT projects; the efficient and effective modernization of Toronto Hydro’s operations
16 in accordance with customer and stakeholder expectations and the continued transition
17 to new and diverse energy resources; and the productive development of industry
18 policies.

19

20 **5.1.5 Information Technology (“IT”)**

21 The IT OM&A program (Exhibit 4, Tab 2, Schedule 17) supports all aspects of Toronto
22 Hydro’s business. The IT infrastructure, cyber security controls, business applications and
23 services supported and delivered by this Program enable efficient operations of the utility

³⁶ Exhibit 2B, Section E8.4.

³⁷ EPRI, *Distribution Operations and Planning*, online: <<https://www.epri.com/portfolio/programs/108271>> .

³⁸ IESO, *Transmission-Distribution Coordination Working Group* online: <<https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Transmission-Distribution-Coordination-Working-Group>> .

1 and play a critical role in achieving Toronto Hydro’s objective to provide safe, secure and
2 reliable electricity. Adequate resourcing for this area is key to supporting the execution
3 of the 2025-2029 investment plan. Toronto Hydro intends to increase resources in this
4 area by 18 percent from 107 to 126 staff between the end of 2022 and 2029.

5

6 As discussed in Exhibit 2B, Section E8.4, Toronto Hydro needs to invest in IT/OT hardware,
7 software, and communications infrastructure over the 2025-2029 rate period to maintain
8 relevant assets and systems in reliable operating condition, renew assets at end-of-life or
9 vendor support, implement and maintain robust controls against increasing and more
10 sophisticated cyber security threats, and contribute to the utility’s capacity to
11 accommodate growth and modernization journey in the context of the broader energy
12 transition. The IT program requires a larger staff complement and the appropriate mix of
13 skillsets to execute and support these initiatives, as each project requires subject matter
14 experts, technical staff, and project managers to effectively and efficiently achieve the
15 planned outcomes. The increasing prominence of cloud solutions intensifies these
16 demands, as IT solutions that were traditionally on-premises and may have required a
17 particular skillset and/or complement of resources may now require a significantly
18 different skillset and resource mix where the utility relies on a cloud-based application.

19

20 Cyber security controls must be periodically refreshed and enhanced to maintain the
21 reliability and availability of systems to support core operations, mitigate against
22 potential vulnerabilities and threats, and minimize the risks of system failure. Investments
23 in this area constitute a significant part of Toronto Hydro’s IT plan for the 2025-2029 rate
24 period,³⁹ and to execute this work and keep up with the shifting cyber security landscape
25 and controls, Toronto Hydro needs additional IT staff with enhanced skillsets.

³⁹ Exhibit 2B, Section E8.4 and Exhibit 4, Tab 2, Schedule 17.

1 In addition, Toronto Hydro has observed the following workload trends driving the
2 program's resourcing needs:

- 3 • From 2020-2024 to 2025-2029, an increase of 6 percent in the number of endpoint
4 devices supported by the program;
- 5 • From 2020-2024 to 2025-2029, an increase of 18 percent in the number of
6 complex systems operated and maintained by the program;
- 7 • From 2020 to 2023, an increase of 22 percent in IT service requests handled by
8 the program; and
- 9 • From 2020-2024 to 2025-2029, an increase of 9 percent in cyber security systems
10 and controls overseen by the program.

11
12 If Toronto Hydro were forced to deliver this program with a reduced level of funding or
13 staffing over the 2025-2029 rate period, the utility could face various cyber security risks
14 and suffer from a significant loss in business efficiency due to a decline in the quality and
15 availability of IT solutions and tech support.

16 **5.1.6 Customer Care**

17 As the electricity industry evolves, Toronto Hydro's customer service functions must keep
18 up with broad changes in customer needs and preferences driven by the energy transition
19 and adapt to handle evolving customer behaviour and more complex information. As
20 discussed in Exhibit 4, Tab 2, Schedule 14, the utility is already observing these trends
21 even with respect to traditional customer interactions. For example, a high bill inquiry
22 now often requires a frontline representative to consider more factors than before, such
23 as the customer's choice of available pricing plans (e.g. tiered, Time of Use, Ultra-Low
24 Overnight Time of Use) or the customer's usage of electricity-intensive devices such as
25 electric vehicle chargers or heat pumps. These trends are even more pronounced with
26 respect to services that have been historically niche areas, but are gradually becoming

1 more commonplace, such as DERs. For example, the billing of net metered accounts is an
2 order of magnitude more complex than regular load accounts, due to the calculation of
3 generation credits and the treatment of Harmonized Sales Tax.

4

5 In this environment, customers' expectations are also continually reshaped by all service
6 providers they interact with, not just utilities. As online services and electronic
7 transactions are gradually becoming the norm for the majority of small and large
8 businesses, customers are coming to expect the same standard of service from their
9 electricity distributor as table stakes.

10 Toronto Hydro's customer-interfacing operations are adapting to these trends by
11 increasing the variety of communication channels available to customers, with a focus on
12 self-service. In 2022, the number of such channels increased from seven to nine, with the
13 addition of live chat and Toronto Hydro's mobile application.⁴⁰ As a result, customers are
14 currently able to perform a broad variety of online transactions, such as registering for
15 electronic bills ("eBills"), requesting move-ins or move-outs, downloading consumption
16 information for their rental property,⁴¹ registering for pre-authorized debits, or reporting
17 streetlight outages. While each channel adds to customer convenience, managing
18 interactions through different channels requires different staff skills to operate and
19 perform analytics for gaining insights on customer behaviour and each channel's
20 effectiveness and efficiency.

21

22 From the end of 2022 to 2029, Toronto Hydro intends to increase resourcing in this area
23 by 39 percent from 106 to 147 staff. Against the trends discussed above, Toronto Hydro

⁴⁰ The previously existing seven channels are telephone, email, fax, Toronto Hydro's website, interactive voice response ("IVR") through the Contact Centre function, and the online customer self-service portal.

⁴¹ Pursuant to Ontario Regulation 389/10, under the *Energy Consumer Protection Act, 2010*, SO 2010, c 8.

1 plans to transfer certain customer-interfacing functions from its external contact centre
2 vendor to internal staff, in order to build, preserve, and diversify in-house knowledge and
3 expertise of core functions, and leverage the same for modernization initiatives and
4 projects or business processes borne out of regulatory compliance requirements.

5

6 Parallel to the insourcing effort, the utility plans to hire new staff to replace retiring staff
7 and/or fill vacant positions. The addition of new and relatively inexperienced staff drives
8 the need for more training time and quality assurance (“QA”) work. In order to increase
9 the effectiveness of QA processes, Toronto Hydro plans to increase its reliance on
10 technology and data analytics—for example, deploying speech analytics tools to
11 transcribe and analyze customer interactions, assess indicators of customer sentiment
12 and intent, and identify call drivers. The application of such techniques and strategies to
13 quality management, powered by artificial intelligence and machine learning
14 technologies, enables evaluation of customer service performance based on more robust
15 empirical data. In order to leverage and unlock the full potential of these capabilities,
16 Toronto Hydro must invest in human capital with the necessary data analytics skillsets.

17

18 Knowledge management is another area driving resourcing needs in Customer Care. As
19 the complexity of service offerings and customer interactions grows, either through new
20 legislative and regulatory requirements or evolving customer needs and technologies, it
21 is becoming more important to keep knowledge management databases current. The
22 utility needs dedicated staff for maintaining consistent and current information and
23 making it accessible to customers and staff across all engagement channels.

1 **5.1.7 Corporate Services**

2 Corporate services provide organization-wide support in the areas of Finance, Public,
3 Legal, and Regulatory Affairs (“PLRA”), and Human Resources, Environment and Safety
4 (“HRES”). From the end of 2022 to 2029, resources in corporate services are forecasted
5 to increase by 13 percent from 233 to 263 staff. As the volume and complexity of Toronto
6 Hydro’s capital investments and operations increase in the 2025-2029 period, corporate
7 services require a highly skilled and dedicated workforce to perform all of these functions
8 in a timely and effective manner.

9

10 The Finance program (Exhibit 4, Tab 2, Schedule 16) supports Toronto Hydro’s operations
11 through financial planning, management reporting, capital planning and reporting,
12 payroll and disbursements, corporate tax, treasury, insurance, and internal audits, as well
13 as external reporting and financial regulatory and revenue management. Toronto Hydro
14 needs an adequate complement of finance professionals to administer the utility’s
15 complex financial and accounting processes and records in the face of increasing volumes
16 of work (i.e. projects and transactions) borne out of the capital program.

17

18 The PLRA program (Exhibit 4, Tab 2, Schedule 18) provides specialized legal, regulatory,
19 government and public relations professional services to the utility and its affiliates.
20 Higher work capital volumes (such as offers to connect), evolving legal, regulatory, and
21 policy requirements (as noted above in section 4.2.4) and changing business conditions
22 necessitate highly-skilled and experienced staff to address complex and consequential
23 legal, regulatory, and public affairs matters. These needs are most cost-effectively
24 addressed by internal resources with the necessary skills and experience to provide the
25 required services in a holistic manner that is integrated with other business functions.
26 Attracting and retaining talent in this area of corporate services is a particular challenge

1 because the utility competes with law firms and large sophisticated organizations such as
2 banks that often offer more attractive compensation packages.

3

4 The HRES program (Exhibit 4, Tab 2, Schedule 15) provides comprehensive human
5 resource management services ranging from employee lifecycle, labour relations,
6 employee communications and engagement, governance of health and safety and
7 environmental management systems, and human resources technology management. All
8 of these activities are carried out within a culture of ensuring employees' health and
9 safety, and environmental sustainability. Looking ahead to 2025-2029, the utility's talent
10 acquisition, management, and retention services, compensation, and performance
11 management frameworks must be equipped to serve the human resource needs of a
12 growing organization that is challenging itself (through its greatest asset—people) to
13 maintain a record of high-performance and deliver incremental outcomes to customers
14 during a time of unprecedented change and transformation.

15 Without sufficient funding to maintain its Corporate Services functions, the utility could
16 be exposed to a number of risks, including legal, compliance, and customer-related risks
17 and drawbacks, all of which would compromise its ability to deliver outcomes that
18 customers value and expect. These consequences include: reduced governance and
19 oversight of financial planning and management activities, leading to a greater risk of
20 errors and omissions; ineffective or unfavourable negotiation of contract terms, resulting
21 in substandard performance by contracted parties or foregone recourse to appropriate
22 remedies, reducing the value and increasing costs to ratepayers; non-compliance or
23 inadequate implementation of new requirements resulting in increased customer
24 complaints and barriers to achieving public policy objectives; a reduced ability to
25 successfully recruit and develop the skilled and specialized resources that Toronto Hydro

1 requires to execute its investment plan; and increased likelihood of safety-related
2 incidents or incidents with an adverse environmental impact.

3

4 **5.2 Other Key Drivers**

5 Expenditures in OM&A are also driven by factors in addition to staffing levels. Below is an
6 overview of the key, non-staffing related drivers.

7

8 **5.2.1 Asset Maintenance Requirements**

9 Toronto Hydro's distribution system consists of approximately 61,000 distribution
10 transformers, 17,000 primary switches, 15,600 kilometres of overhead conductors, and
11 13,800 kilometres. Toronto Hydro leverages its reliability centred maintenance
12 framework, in combination with the OEB's minimum inspection requirements,⁴² and
13 continuous monitoring and assessment of asset performance to maintain equipment in
14 good working order throughout its expected serviceable life, and where possible, to
15 increase the useful life for enhanced value. This includes conducting inspections and
16 maintenance tasks on a fixed (or variable) cycle as necessary, as well as completing
17 corrective work to address asset deficiencies and risks that jeopardize system safety and
18 reliability. The Corrective Maintenance program, in particular requires significant
19 investments to address a number of incremental drivers:⁴³

- 20 • **Corrective Work Requests:** Toronto Hydro uses a prioritization framework that
21 classifies asset deficiencies into four categories, depending upon the
22 urgency/severity of the deficiency. Since 2019, the utility observed a rise in the
23 volume of corrective work in the "P3" category requiring resolution within 180
24 days due to the proportion of assets exhibiting deteriorating conditions and

⁴² OEB, *Distribution System Code*, Appendix C, (August 2, 2023).

⁴³ Exhibit 4, Tab 2, Schedule 4.

1 exceeding their expected lives. These asset deficiencies elevate the risk of failure
2 and must be managed to keep the system safe and reliable for customers.

- 3 • **Electrical Safety Authority (“ESA”) Requirements:** Toronto Hydro plans its
4 maintenance programs with a view to achieving and maintaining compliance with
5 electrical distribution safety requirements under Ontario Regulation 22/04,⁴⁴ in
6 accordance with directives and guidelines issued by the ESA from time to time.
7 This includes work such as the disconnection and grounding of unused lines, and
8 responding to ESA directives and flash notices identifying hazards and risks that
9 must be addressed. A recent example of such ESA-directed work is “Delta to Wye”
10 conversions based on a 2018 flash notice to distributors and which is expected to
11 continue driving work volumes into the 2025-2029 rate period.

- 12 • **Emergency Response:** Corrective work may also be required as a result of
13 emergencies or unplanned system events, including asset failures and deficiencies
14 identified outside of Toronto Hydro’s daily (planned) operations (including ESA
15 field inspections) but requiring follow-up remediation in order to permanently
16 restore power or eliminate safety or environmental risks. The emergence of such
17 issues and the extent of the work (and costs) required to address them are
18 unpredictable. As the distribution system becomes more heavily utilized due to
19 electrification, the emergence of such compliance issues is expected to grow.

20
21 Toronto Hydro must address asset maintenance requirements in a timely manner in order
22 to: (i) remain compliant with the Distribution System Code, (ii) satisfy electrical
23 distribution safety requirements under Ontario Regulation 22/04, and (iii) maintain a safe
24 and reliable system for customers in alignment with good utility practice. Without
25 sufficient funding for asset maintenance, all of these critical outcomes are placed at risk.

⁴⁴ Ontario Regulation 22/04, under the *Electricity Act, 1998* SO 1998, c 15, Sched A.

1 **5.2.2 Cloud Computing**

2 Cloud solutions equip the utility with dynamic and cost-effective software tools to support
3 the automation and modernization of business processes and protect the system against
4 increasing cyber security threats. Toronto Hydro invests cloud computing solutions in
5 accordance with the utility's IT Investment Strategy outlined in Exhibit 2B, Section D8.
6 Costs to implement cloud-based solutions typically include project initiation, planning,
7 execution (e.g. configuration, development, testing, customization, etc.), monitoring and
8 control, and deployment. Recent drivers of cloud computing expenses include:⁴⁵

- 9
- 10 • The implementation of new applications such as Oracle Field Services Cloud
11 ("OFSC"), an upgrade to the mobile workforce management system for Grid
12 Emergency Management, which replaced the legacy on-premises in-house
13 solution. OFSC allows dispatchers and grid response crews to collaboratively
14 manage outage events with respect to assembling crews, managing priorities, and
15 communicating across different groups to respond to an unplanned outage events
16 in a timely and effective manner.
 - 17 • Cyber security maintenance and subscription fees as a result of new investments
18 into cloud-based, artificial intelligence-enabled threat prevention, detection, and
19 response solutions to ensure that cyber security processes and controls are
20 capable of adequately responding to the evolving threat landscape.

21 Cloud-based solutions increase the range of IT solutions available to Toronto Hydro and
22 provide the utility more flexibility in designing and implementing IT systems and controls.
23 However, the shift from the traditional perpetual software licensing model to cloud
24 subscription and maintenance fees is driving incremental OM&A expenditures as more IT
25 vendors move towards a subscription model for both cloud-based and on-premises

⁴⁵ Exhibit 4, Tab 2, Schedule 17.

1 systems. In fact, many vendors are adopting "cloud only" solutions that rely solely on
2 cloud technologies instead of providing an option to host a solution on-premises.

3
4 Toronto Hydro requires sufficient funding for cloud solutions to: (i) serve growing
5 technology requirements across the business driven by modernization imperatives and
6 innovation opportunities; (ii) adequately protect its grid and systems against cyber
7 security threats; and (iii) retain flexibility in a more dynamic technology environment.

8 9 **5.2.3 Non-Wires Solutions (Local Demand Response)**

10 Toronto Hydro's Non-Wires Solutions ("NWS") program was established in the 2015-2019
11 Distribution System Plan to address capacity constraints through local demand response
12 ("LDR").⁴⁶ Building on its existing LDR experience, Toronto Hydro identified further
13 opportunities to use LDR in the 2025-2029 rate term to avoid and defer capital
14 investments in load transfers, and set an ambitious goal to expand the reach of the LDR
15 program in the next rate term. Toronto Hydro intends to procure 30 MW of flexible
16 system capacity to displace and defer the need for load transfers in the Horseshoe North
17 area during the 2025-2029 period. Load transfers in this area are currently necessary to
18 alleviate capacity constraints at a number of stations, including Finch TS and Bathurst TS.
19 The goal is to use LDR to defer or displace certain load transfers by procuring flexible
20 system capacity from third-party or customer-owned DERs.

21 22 **5.2.4 Insurance Premiums**

23 Insurance premium costs are included in the Finance program.⁴⁷ The utility anticipates an
24 upward trend in insurance costs through to 2029 that is attributable to higher rates on

⁴⁶ Exhibit 2B, Section E7.2.

⁴⁷ Exhibit 4, Tab 2, Schedule 16.

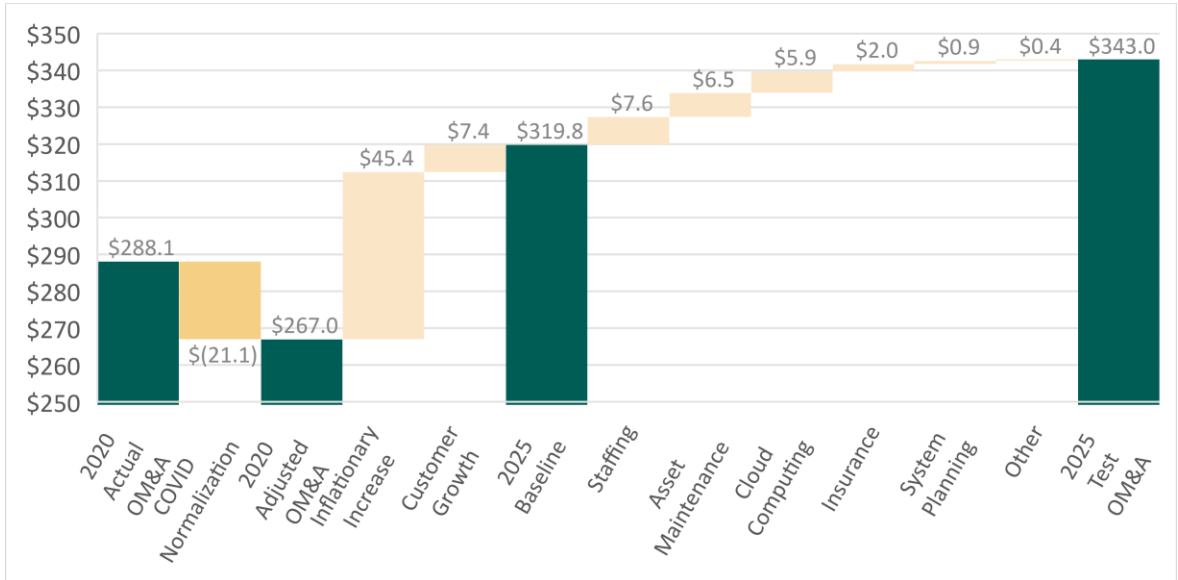
1 the existing insurance program policies for property, liability, cyber, directors and officers
2 (“D&O”), and crime. In particular, cyber security insurance premiums are increasing in
3 correlation with growing and more acute cyber security threats that affect large
4 organizations such as Toronto Hydro each year. In addition, Toronto Hydro’s rate base is
5 expected to increase from \$4.9 billion in 2022 to \$7.6 billion in 2029 which has a direct
6 impact on the future property and liability insurance premiums. Without sufficient
7 funding for insurance costs, Toronto Hydro may face challenges securing financing for its
8 work programs, risk contravention of covenants contained in existing debt issuances, and
9 be exposed to compliance risks vis-à-vis relevant tax laws, rules, and regulations.

10

11 **6. Variance Analysis**

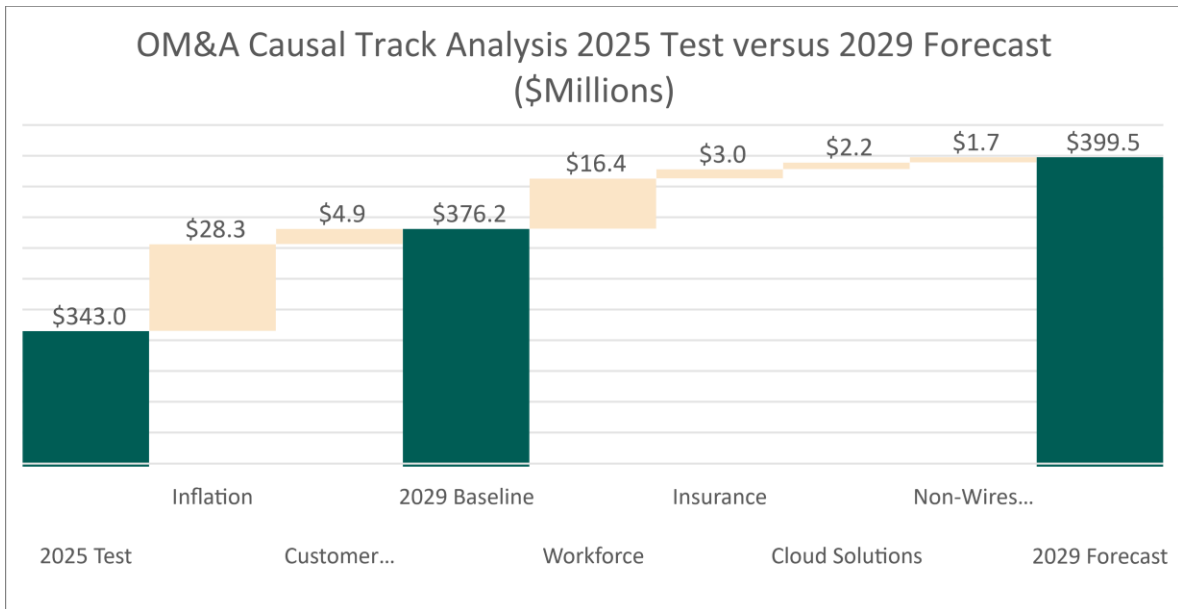
12 Consistent with applicable OEB guidance,⁴⁸ detailed variance analyses by OM&A program
13 and segment can be found in Exhibit 4, Tab 2, Schedules 1 to 21. In this section, Toronto
14 Hydro concludes with a macro level causal track analysis that summarizes the key drivers
15 discussed throughout this OM&A overview schedule.

⁴⁸ Including, for example, OEB Filing Requirements for Electricity Distribution Rate Applications, Chapter 2 (December 15, 2022), s. 2.4; and the Handbook for Utility Rate Applications (October 13, 2016) at page 19.



1 **Figure 14: OM&A Causal Track Analysis 2020 Test versus 2025 Test (\$ Millions)**

2



3 **Figure 15: OM&A Causal Track Analysis 2025 Test versus 2025 Forecast (\$ Millions)**

1 **PREVENTATIVE AND PREDICTIVE OVERHEAD LINE MAINTENANCE**

2

3 **1. OVERVIEW**

4 **Table 1: Preventative and Predictive Overhead Line Maintenance Program Summary**

Preventative and Predictive Overhead Line Maintenance Program									
Outcomes: Operational Effectiveness - Reliability, Environment, Operational Effectiveness - Safety, and Customer Focus									
Segments:									
<ul style="list-style-type: none"> • Overhead Line Patrols & Pole Inspections • Overhead Switch Maintenance & Insulator Washing • Vegetation Management • Metering Services 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
5.8	6.2	5.7	7.2	7.9	9.1	9.2	9.6	9.5	9.4

5

6 The Preventative and Predictive Overhead Line Maintenance program (the “Program”) funds Toronto Hydro’s maintenance activities on: (i) Toronto Hydro’s overhead line assets; and (ii) metering assets and associated communication systems that enable meter data collection and tracking to ensure compliance with applicable legislative and regulatory requirements. This Program involves inspection and maintenance tasks typically conducted on a fixed cycle, including inspection of equipment for indications of potential failure. The segments in this Program are focused on preserving and maximizing the performance of assets over their expected useful life while mitigating a wide variety of system risks. The Program is also designed to minimize overall asset lifecycle costs, account for factors such as the safety of Toronto Hydro work crews and the public,

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8
9
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14
15

1 responsible environmental stewardship and associated obligations, and compliance with
2 statutory and regulatory requirements.¹

3 The Preventative and Predictive Overhead Line Maintenance program is comprised of the
4 following four segments:

5

- 6 • **Overhead Line Patrols & Pole Inspections:** This segment funds periodic line
7 patrols to inspect all overhead distribution equipment, including pole-mounted
8 transformers, switches, auxiliary equipment, and conductor wire. In addition to
9 line patrols, the segment also includes dedicated pole inspections and wood pole
10 treatment as well as inspections of poles to assess the need for additional guying
11 for reinforcement during storm events;
- 12 • **Overhead Switch Maintenance & Insulator Washing:** This segment funds two
13 general sets of maintenance activities on the overhead distribution system: (i) the
14 periodic maintenance of overhead switches such as SCADA-Mate and Three Phase
15 Gang-Operated Switches; and (ii) the washing of porcelain insulators located at
16 high-risk locations prone to contamination build-up;
- 17 • **Vegetation Management:** This segment funds the trimming of vegetation near
18 overhead feeders to minimize the impact of tree-caused power interruptions on
19 system reliability;
- 20 • **Metering Services:** This segment funds the inspection and maintenance of
21 metering assets and associated communication technologies to ensure proper
22 functionality and compliance with applicable legislative and regulatory
23 requirements;

¹ Ontario Energy Board, Distribution System Code (August 2, 2023) Appendix C.

1 By preserving and maximizing the performance of overhead line and metering assets and
 2 ensuring these assets are fully operational, this Program contributes to maintaining
 3 safety, environmental stewardship, and overall system reliability at reasonable costs to
 4 Toronto Hydro’s customers. In addition, the Program contributes to customer experience
 5 and satisfaction by facilitating: (i) the tracking of accurate and timely electricity
 6 consumption information for customer billing purposes; and (ii) the use of up-to-date
 7 communication technology that enables remote reading and processing of customer
 8 meter information.

9

10 **2. OUTCOMES AND MEASURES**

11 **Table 2: Preventative and Predictive Overhead Line Maintenance Program Outcomes**
 12 **and Measures Summary**

Operational Effectiveness - Reliability	<ul style="list-style-type: none"> Contribute to the overall system performance and reliability – as measured by performance metrics like SAIFI, SAIDI, Customers Interrupted (“CI”), and Customer Hours Interrupted (“CHI”) – by promptly identifying potential asset failure or assets in substandard conditions before failure occurs, through planned inspections in compliance with the Ontario Energy Board’s (“OEB”) Distribution Systems Code (“DSC”).
Environment	<ul style="list-style-type: none"> Contribute to reducing the environmental impact of Toronto Hydro’s distribution system by proactively identifying transformers exhibiting signs of oil deficiencies for replacement, thereby reducing the likelihood of oil spills into the environment.
Operational Effectiveness - Safety	<ul style="list-style-type: none"> Contribute to Toronto Hydro’s safety objectives (including compliance with Ontario Regulation 22/04, and safety performance as reflected by metrics like the Serious Electrical Incidents Index and Total Recordable Injury Frequency through proactive inspections to identify and reduce the likelihood of equipment malfunction (e.g. porcelain switch breaking) and asset failures (e.g. collapse of a pole or flashovers on electrical equipment) which, if not prevented, may lead to injury of the general public and/or Toronto Hydro’s crews.

Customer Focus	<ul style="list-style-type: none">Contribute to Toronto Hydro’s customer focus objectives by ensuring the accurate billing of all smart metered customers based on actual usage, and mitigating the risk of meter seals expiring before their testing and re-validation (which also supports compliance with applicable regulatory requirements like the <i>Electricity and Gas Inspection Act</i>,² and the <i>Weights and Measures Act</i>).³
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1 **3. PROGRAM DESCRIPTION**

2 The Preventative and Predictive Overhead Line Maintenance program funds all
3 maintenance activities with respect to Toronto Hydro’s overhead distribution system and
4 metering assets, including meters and communication systems that enable meter data
5 collection and tracking. This Program involves inspection and maintenance tasks typically
6 conducted on a fixed cycle and inspection of equipment for predetermined conditions
7 indicative of a potential failure. The segments in the Program focus on preserving and
8 maximizing the performance of assets over their expected useful life while mitigating a
9 variety of system risks. The Program is also designed to minimize overall costs and
10 account for factors such as the safety of Toronto Hydro’s work crews and the public,
11 responsible environmental stewardship and associated obligations, and compliance with
12 applicable statutory and regulatory requirements.

13
14 The Preventative and Predictive Overhead Line Maintenance program is comprised of the
15 following four segments:

- 16
17
 - Overhead Line Patrols & Pole Inspections:** this segment funds periodic line patrols
18 to inspect and assess the condition of all overhead distribution equipment
19 including pole-mounted transformers, switches, auxiliary equipment, and

² RSC 1985, c. E-4. [*Electricity and Gas Inspection Act*]

³ RSC 1985, c. W-6. [*Weights and Measures Act*].

1 conductor wire. In addition, this segment also includes dedicated pole inspections
2 of all wood, concrete, and steel poles as well as wood pole treatments, and
3 inspections of poles to assess the need for additional guying for reinforcement
4 during storm events.

- 5 • **Overhead Switch Maintenance & Insulator Washing:** this segment funds two
6 general sets of maintenance activities on the overhead distribution system: (1) the
7 periodic maintenance of overhead switches such as SCADA-Mate and Three Phase
8 Gang-Operated Switches, and (2) the washing of porcelain insulators located at
9 high-risk locations prone to contamination build-up.
- 10 • **Vegetation Management:** this segment funds the trimming of vegetation near
11 overhead feeders to minimize the impact of tree-caused power interruptions on
12 system reliability.
- 13 • **Metering Services:** this segment funds the inspections and maintenance of
14 metering assets and associated communication technologies to ensure proper
15 functionality and compliance with applicable legislative and regulatory
16 requirements. Metering maintenance activities include: meter audits to verify
17 meter accuracy; verifying, testing and troubleshooting wholesale meters installed
18 at transmission grid supply points; investigating communication issues; and
19 installing reused meters following accuracy testing.

20 21 **4. PROGRAM COSTS**

22 In 2025, Toronto Hydro requires \$9.1 million in rate funding for the Preventative and
23 Predictive Overhead Line Maintenance program, which represents an increase of \$3.3
24 million over the 2020-2024 rate application.

1 Over the 2025-2029 rate period, the utility expects the cost of this program to increase
 2 by a compounded annual growth rate of 1.0 percent, which is necessary to address
 3 overhead line maintenance needs and deliver the customer outcomes enabled by this
 4 program.

5 The Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-2029) expenditures
 6 for each segment are summarized in Table 3 below.

7

8 **Table 3: Overhead Maintenance Program Expenditures by Segment (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Overhead Line Patrols & Pole Inspections	0.5	0.5	0.5	0.5	0.6	0.8	0.8	0.9	0.9	0.9
Overhead Switch Maintenance & Insulator Washing	1.4	1.6	1.3	1.6	1.7	2.4	2.4	2.5	2.6	2.6
Vegetation Management	2.8	3.4	3.5	3.5	3.8	4.0	4.1	4.2	4.3	4.4
Metering Services	1.1	0.7	0.4	1.6	1.8	1.9	1.9	2.0	1.7	1.5
Total	5.8	6.2	5.7	7.2	7.9	9.1	9.2	9.6	9.5	9.4

9

10 **4.1 Cost Drivers**

11 Cost variances are partly attributed to varying numbers of units scheduled for inspections
 12 each year based on their inspection cycle. For example, from 2020 to 2021 overhead line
 13 patrols and infrared thermography scans increased from 5,862 km to 7,576 km. Other
 14 cost drivers include:

- 15 • The adjustment of inspection frequencies for wood poles from ten years to eight
 16 years, and the implementation of a new inspection program for concrete and steel
 17 poles starting in 2025;
- 18 • The increase in the annual volumes of overhead switches maintained to achieve a
 19 six-year maintenance cycle starting in 2025;

- 1 • An increase in vegetation management costs to address an ever-growing tree
2 canopy and reduce potential outages caused by tree-related contacts; and
3 • Increases in metering services costs due to the growing number of suite metering
4 units driven by the growing population of condominium residents, as well as
5 changes in the volume of meters due to be tested and resealed each year.

6

7 **4.2 Cost Control and Productivity Measures**

8 4.2.1 Cost Management

9 Toronto Hydro has a competitive bid process with a wide range of contractors involved in
10 bidding for our contracted work, which helps keep costs competitive across vendors and
11 provides more options.⁴

12

13 For the Overhead Line Patrol segment, starting in 2019 Toronto Hydro has tracked the
14 exact number of kilometers of overhead distribution patrolled each year in order to
15 ensure it is more accurately charged for areas patrolled.

16

17 For the Vegetation Management segment, planned trimming activities are expected to
18 reduce the number of areas requiring reactive spot trimming, which can cost as much as
19 50 percent more than planned trimming; the bundling of feeders from the same station
20 whenever possible will yield further costs savings; and the piloting of new technologies
21 such as LiDAR and satellite imagery is expected to further improve the efficiency of the
22 program.

⁴ Exhibit 4, Tab 2, Schedule 15.

1 For Toronto Hydro’s Insulator Washing segment, the reduced number of poles with
2 porcelain insulators, as they are phased out of the system will directly yield cost savings
3 due to fewer poles insulators needing to be washed.

4
5 *4.2.2 Productivity*

6 Toronto Hydro has placed significant emphasis on achieving greater output for the same
7 or reduced input in each of the segments within the Preventative and Predictive Overhead
8 Line Maintenance program. Toronto Hydro continues to rely on a Reliability Centered
9 Maintenance (“RCM”) approach and adjusts maintenance tasks and frequencies based on
10 RCM and Condition-based Maintenance principles. Toronto Hydro also does the
11 following:

- 12 • Standardize the maintenance cycles of overhead switches to align with station
13 maintenance cycles wherever possible to minimize the need for multiple
14 equipment outages and significant switching resources, enable efficient execution
15 of more maintenance work per outage, and minimize the need for multiple visits
16 to work on particular sites;
- 17 • Implement “find and fix” protocols whereby crews that identify minor asset
18 deficiencies address the deficiencies (e.g. replacing equipment nomenclature or
19 addressing missing or defective guy guards and pole ground wires) onsite, as
20 opposed to only logging the deficiencies for future action under the Corrective
21 Maintenance program;⁵
- 22 • Issue longer-term inspection maintenance contracts to third party service
23 providers to keep unit costs stable and increase service quality levels over time
24 (i.e. as result of accumulated service provider experience and familiarity with
25 identifying deficiencies on Toronto Hydro’s distribution system); and

⁵ Exhibit 4, Tab 2, Schedule 4.

- 1 • Introduce new tools or making greater use of existing technology such as Infrared
2 Thermography, Electronic Maintenance Sheets, Online Partial Discharge Testing,
3 LiDAR, and satellite imagery; and,
- 4 • Migrate from phone line based communication to more reliable communication
5 technology (i.e. wireless), reducing costs associated with on-site investigations
6 and troubleshooting.

7

8 The following sections describe each of the segments in the Preventative and Predictive
9 Overhead Line Maintenance program.

10 **5. OVERHEAD LINE PATROLS AND POLE INSPECTIONS SEGMENT**

11 **5.1 Segment Description**

12 Toronto Hydro conducts line patrols to inspect its overhead lines – approximately 4,100
13 circuit kilometres of primary and 11,500 circuit kilometres of secondary distribution lines
14 – every three years. Infrared thermography scans are also performed annually on all
15 primary lines and nearby secondary lines. The three-year inspection cycles for line patrols
16 are as mandated by the OEB’s Minimum Inspection Requirements (under Appendix C of
17 the DSC).⁶

18

19 Line patrols cover all overhead distribution equipment including poles, conductor wires,
20 pole-mounted transformers, switches, lightning arrestors, line insulators, and other
21 peripheral attachments. Approximately 139,000 poles, 30,700 overhead transformers,
22 and 7,350 overhead switches are inspected through line patrols.

23

24 Toronto Hydro also conducts dedicated pole inspections for its wood poles which are
25 currently conducted on a ten-year cycle. All wood poles are either butt or full length

⁶ *Supra* note 1.

1 treated against rot. For the reasons discussed below, beginning in 2025, Toronto Hydro
2 plans to adjust this cycle for wood poles to every eight years and also to begin inspecting
3 all concrete and steel poles on a ten-year cycle. In addition, Toronto Hydro also conducts
4 inspections to identify poles that are in need of additional guying for reinforcement during
5 storm events and undertakes condition based maintenance for poles by targeting certain
6 poles found to be in poor condition or at a higher risk of failure more frequently. Toronto
7 Hydro has approximately 105,000 wood poles, 29,700 concrete poles and 3,600 steel
8 poles.

9

10 Overhead line patrols are designed to identify visible deficiencies (such as signs of leaking
11 transformers, loose or broken attachments (e.g. cross-arms, insulator brackets), and
12 damaged poles), as well as deficiencies that can be identified through infrared
13 thermography. This technology identifies thermal anomalies, such as a significant
14 increase in temperature at the secondary connection point of the pole-mounted
15 transformer shown in Figure 1. If undetected and not addressed, such a deficiency can
16 lead to a failure of the connection over time and result in safety and environmental risks
17 due to arcing, which can lead to a transformer fire and release of oil into the environment.
18 The Institute of Electrical and Electronics Engineers (“IEEE”), American National Standards
19 Institute (“ANSI”) and the International Electrotechnical Commission (“IEC”) all publish
20 standard temperature ratings for assets, which are used to determine if an electrical
21 component has a temperature above the recommended value. Thermography is an
22 accepted and encouraged practice in the utility industry as evidenced by the National Fire
23 Protection Association’s standard 70B: Recommended Practice for Electrical Equipment
24 Maintenance.⁷

⁷ National Fire Protection Association, Standard for Electrical Equipment Maintenance (2023).



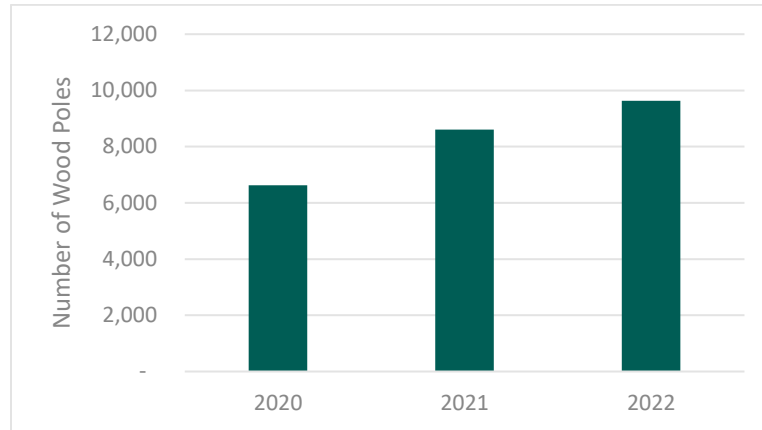
1 **Figure 1: Secondary Connection on Pole-Mounted Transformer (Left) with an Infrared**
2 **Thermography Image of the Same Asset Denoting a Hot Spot at A1 (Right)**

3
4 Wood pole inspections involve a visual assessment of each pole and a sounding test using
5 a hammer to check for internal cavities, which can indicate an infested or internally
6 decayed pole. Based on the results of this assessment, one or more of the following steps
7 may be taken:

- 8
- 9 • A bore test (using a 12 millimetre diameter bit to drill into the pole) to assess the
10 condition of the shavings from the interior;
 - 11 • A resistograph test (using a 2 millimetre diameter needle drill bit and an electronic
12 resistance measurement device to drill into the pole) to determine the presence
13 of wood decay, stages of rot, and hollow areas;
 - 14 • Treatment using a boron glass rod or copper-boron glass rod wood preservative;
 - 15 • Treatment using an external copper naphthenate wrap; and
 - 16 • Treatment using an internal fumigant.

17 Beginning in 2025, Toronto Hydro is adjusting the inspection cycle for wood poles from
18 ten to eight years to better manage the growing volume of wood poles past their useful
19 life and in HI4 and HI5 condition based on the asset condition assessment (“ACA”) as
20 shown in Figure 2 below. This adjustment will also allow Toronto Hydro to better inform

1 its wood pole ACA and support planning of system renewal investments with more timely
2 inspection data of poles in poor condition.



3 **Figure 2: Wood Poles in HI4 & HI5 from 2020-2022**

4
5 From 2025 onward, Toronto Hydro will begin to inspect concrete and steel poles in
6 addition to wood poles as part of its dedicated pole inspection program on a ten-year
7 cycle. Inspections of these poles are supported by the Canadian Securities Administrators
8 (CSA) Standard C22.3. Inspections of these poles will allow Toronto Hydro to improve
9 decisions on planned renewal investments for these assets. Further, this is expected to
10 reduce the burden on reactive capital by proactively identifying poles with substandard
11 conditions and scheduling them for replacement before they require costly reactive
12 intervention. Toronto Hydro had originally planned to conduct inspections for these
13 assets in 2020, however Toronto Hydro postponed this initiative until 2025 to give
14 flexibility in the short-term budgeting for this segment and more time to plan ahead for
15 the implementation of inspections for these assets.

16
17 Overhead line patrols and pole inspections serve to assess asset conditions and identify
18 overhead asset deficiencies resulting from aging assets or exposure to weather, animals,
19 trees, or other environmental elements. Condition and deficiency information gathered

1 during these activities is utilized to plan and prioritize capital and corrective maintenance
2 work, so that public and employee safety, environmental, system reliability, and financial
3 risks can be mitigated. Pole treatment activities are undertaken to extend the life of the
4 pole and mitigate the risk of decay.

5

6 During 2020-2022, Toronto Hydro identified on average approximately 7,100 deficiencies
7 annually during line patrols. Deficiencies identified include loose or deteriorated
8 connections, missing guy guards, tracking insulators, rusted equipment, oil leaks,
9 vegetation interference, damaged conductors and conductor splices, which are all
10 addressed in the Corrective Maintenance or Reactive and Corrective Capital programs.⁸
11 Identifying and addressing these issues reduces the likelihood of a component failure and
12 the associated risks. For example, an aging conductor splice that fails could result in a live
13 conductor dropping to the ground, which would create a serious safety risk to the public
14 and Toronto Hydro employees and cause a power interruption that may impact hundreds
15 of customers. Thermography is used to mitigate this risk as it allows such deficiencies in
16 splices to be identified.

17

18 Dedicated pole inspections identify poles that have lost their mechanical strength and are
19 likely to fail, endangering the crews working on them and possibly resulting in collapse if
20 they remain in service.

21

22 For wood poles, the primary indicator of health and remaining life is mechanical strength,
23 given that the main function of poles is to act as support structures. As a natural material,
24 a wood pole undergoes a different degradation process than most other distribution
25 assets. The degradation processes are primarily biological and cumulative with age. They

⁸ Exhibit 4, Tab 2, Schedule 4 and Exhibit 2B, Section E6.7.

1 consist of insect infestation, moisture ingress, and bird or fungi attacks. Decay causes a
2 wood pole to lose its strength and functionality, which increases the risk of a structural
3 failure. Poles often support and withstand significant static loads such as transformer
4 banks and conductors, and dynamic loads such as climbing workers or high winds. They
5 typically fail with the onset of age and the loss of structural strength.

6

7 As further illustrated in Figures 3 and 4 below, deficiencies such as rot and excessive
8 cracking are common causes of pole failures. Between 2020 and 2022, Toronto Hydro
9 condemned on average over 190 wood poles annually.



10

Figure 3: Rot at Base of a Pole



11

Figure 4: (Left) Cracked Wood Pole, (Right) Surface Rot on Pole

12

For steel poles, the most common cause of degradation is corrosion as illustrated in Figure

13

5. The corrosion protection system for steel poles can be compromised by mechanical

1 degradation of the coating due to external impacts by foreign objects or abrasion, adverse
2 weather conditions, and loss of coating due to age.

3



4

Figure 5: Corrosion on Steel Pole Base

5

6 Concrete poles can begin to deteriorate from weather events or mechanical damage by
7 external factors such as vehicle impacts. Cracks on concrete poles can either be
8 circumferential (around the pole) or longitudinal (along the length of the pole), with the
9 latter type typically being more serious in nature as shown in Figure 6 below. Longitudinal
10 cracks can be caused by reinforcing steel being overly close to the surface of the concrete
11 pole or degradation due to weather events such as freeze-thaw conditions.



Figure 6: (Left) Longitudinal Crack on Pole, (Right) Cracked Concrete Base

1
2 During the 2020-2022 period, approximately 26 concrete poles were replaced reactively
3 on average annually.

4
5 Poles are found predominantly along sidewalks, roadways, and other areas of high
6 pedestrian and vehicular traffic. Without routine inspection, there is an unacceptable risk
7 that poles and associated attachments could collapse onto sidewalks, roadways, and even
8 residences. The collapse of a pole can also cause oil spills from ruptured transformer
9 tanks, electrical arcs, flashovers, and fires, which pose serious environmental risks and
10 safety risks to the public and Toronto Hydro employees. Minimizing the likelihood of a
11 pole failure will mitigate these risks. Moreover, pole inspection activities, and in
12 particular wood pole treatments (e.g. application of boron rods, copper naphthenate
13 wraps, and internal fumigant) extend the life of poles and allow for a more efficient and
14 structured capital pole replacement program.

15
16 Between 2020 and 2022, there were on average approximately 130 incidents of overhead
17 asset failures (excluding major event days) each year. These failures were primarily

1 attributed to overhead transformers, switches, conductors, insulators, lightning arrestors
 2 and poles, and caused in excess of 117,000 CIs and 75,000 CHI's annually. Line patrols and
 3 pole inspection activities are in place to identify deficiencies that, if left unaddressed, may
 4 lead to incidents that impact system reliability.

5

6 **5.2 Overhead Line Patrols and Pole Inspections Segment Costs**

7 Table 4 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 8 (2025) expenditures for this segment.

9

10 **Table 4: Overhead Line Patrols and Pole Inspections Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Overhead Line Patrols & Pole Inspections	0.5	0.5	0.5	0.5	0.6	0.8	0.8	0.9	0.9	0.9

11

12 **5.3 Overhead Line Patrols and Pole Inspections Segment Year-over-Year Variance**
 13 **Analysis**

14 2020 – 2021 Variance Explanation

15 There is no material variance during this rate period.

16

17 2021 – 2022 Variance Explanation

18 There is no material variance during this rate period.

19

20 2022 – 2025 Variance Explanation

21 Between 2022 and 2025, expenditures are expected to increase by approximately \$0.3
 22 million, or an average of approximately \$0.1 million per year, primarily due the
 23 adjustment of the inspection frequency for wood poles from ten to eight years and the
 24 addition of inspections for concrete and steel poles in 2025.

1 2025 – 2029 Variance Explanation

2 Between 2025 and 2029, expenditures are forecasted to increase by approximately \$0.1
3 million, which is primarily attributed to inflationary pressures. If Toronto Hydro were
4 forced to deliver this segment with a reduced level of funding over the 2025-2029 rate
5 period, the utility could face various risks, including:

- 6 • Reduced ability to comply with applicable legislative and regulatory requirements
7 such as the OEB’s Minimum Inspection Requirements.⁹
- 8 • Increased frequency of equipment malfunctions or failures due to unidentified
9 deficiencies or lack of maintenance leading to increased:
 - 10 ○ safety risks from incidents such as the collapse of a pole onto a roadway,
11 sidewalk or residence, or flashovers on electrical equipment;
 - 12 ○ environmental risk from oil leaks resulting from unidentified equipment
13 deficiencies such as corrosion on the transformer tank; and
 - 14 ○ reliability risks from the failure of overhead equipment, which can result
15 in outages.
- 16 • Decreased ability to extend the life of wood poles through treatment.

17
18 **6. OVERHEAD SWITCH MAINTENANCE AND INSULATOR WASHING**

19 **6.1 Segment Description**

20 This segment includes two general sets of maintenance activities on the overhead
21 distribution system: (i) maintenance of overhead switches; and (ii) washing of porcelain
22 overhead line insulators.

- 23 • **Overhead Switches:** Toronto Hydro maintains overhead switches on a variable
24 cycle greater than 6 years and beginning in 2025 will adjust the cycle to six-years.
25 There are two main types of switches on Toronto Hydro’s distribution system:

⁹ *Supra* note 1.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- Supervisory Control and Data Acquisition (“SCADA”) Switches (or SCADA-Mate Switches): These switches are motorized, and can be operated remotely from the Control Room via wireless communication, or operated locally by field crews. To enable communication and remote operation during a system failure, the switches and related equipment utilize a battery system that is capable of providing power for switch operation and communication. Maintenance of SCADA switches involves verifying the switch’s remote and local operation along with lubrication of the pivot points on the visible air-gap isolation mechanism. It also includes battery replacements for the switch and repeater radio (in accordance with manufacturer’s recommendations), and Remote Terminal Unit (“RTU”) testing to verify proper communication with the Control Room. Figure 7 below shows a typical SCADA switch.



14 **Figure 7: SCADA-Mate Switch**

- 15
- 16
- 17
- 18
- 19
- 20
- Three Phase Gang-Operated Switches: These switches are found throughout Toronto Hydro’s overhead system and unlike the SCADA switches, are not capable of remote operation. While some have motorized controls, the vast majority are manually operable at the physical switch location. The scope of work to maintain these switches involves

1 verifying correct blade alignment, blade penetration, travel stops, arc
2 interrupter operation, and mechanical operation. The contacts are cleaned
3 and greased and the switch is tested for correct operation. Figure 8 below
4 shows a gang-operated switch.



5 **Figure 8: Manual Gang-Operated Switch**

6
7 In total, Toronto Hydro maintains approximately 2,200 overhead switches comprising of
8 approximately 1,300 SCADA switches and 900 Three Phase Gang-Operated Switches.

9
10 Due to resourcing and operational constraints, Toronto Hydro has historically found
11 achieving the four-year maintenance cycle of its overhead switches noted in its 2020-2024
12 rate application to be challenging, instead attaining variable cycles generally greater than
13 6 years. In order to maximize existing resources, starting in 2023, condition-based
14 maintenance principals have been used to target switches that pose a greater risk of
15 failure. To further alleviate constraints, beginning in 2025, Toronto Hydro will be
16 maintaining overhead switches on a six-year inspection cycle at a minimum. This
17 approach is supported by an independent assessment of Toronto Hydro's overhead
18 switch maintenance practices.

- 19
20 • **Insulator Washing:** Conductors and switches used on the overhead distribution
21 system have historically been attached to poles and structural infrastructure using

1 porcelain insulators (rather than the current standard of polymer insulators).
2 Porcelain insulators have a high dielectric strength and good mechanical
3 properties, including hardness and resistance to chemical erosion and thermal
4 shock. However, porcelain has poor resistance to contamination build-up, which
5 causes tracking (i.e. leakage of electricity across the insulator). The accumulation
6 of dirt and salt, combined with moisture (during misty or foggy days), reduces the
7 effective insulation levels, and can lead to insulator tracking, flashover, and
8 potential pole fires. To mitigate the risk of contamination and insulator tracking,
9 insulators at the highest risk locations are washed twice a year. Insulator washing
10 is performed using a high-pressure intermittent water jet while lines are
11 energized. Figure 9 shows an example of a porcelain insulator being washed.



12 **Figure 9: Porcelain Insulator Washed Using a High Pressure Water Jet**

13

14 Overhead switch maintenance and insulator washing serve to mitigate public and
15 employee safety, system reliability, and financial risks. Manual overhead switching is a
16 common and high-risk activity undertaken by Toronto Hydro crews. Switches that are not

1 regularly maintained can be difficult to operate, which has led to strains and injuries for
2 crew members. Regular maintenance enables the detection and prediction of common
3 failure modes, including the failure of a switch's insulator as shown in Figure 10 below,
4 which can result in an arc flash that can seriously injure crew members.



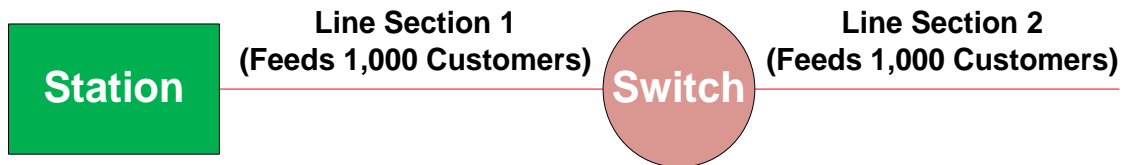
5 **Figure 10: Broken Switch Insulator**

6
7 A second common failure mode is corrosion of switch metal blades. This naturally occurs
8 from contaminants such as road salt and water settling on the switch blades. It can result
9 in excessive heating of the blade and, over time, can lead to the blade failing to conduct
10 electricity. Contaminants and corrosion on a switch blade during a load break operation
11 may also cause the electrical arc to elongate, which causes additional damage to the blade
12 and can lead to blade failure. Associated safety risks include burns from an arc-flash and
13 overexertion injuries to an employee (i.e. if a switch requires a significant amount of force
14 to operate).

15
16 Other common failure modes include switch seizure due to the drying out of lubrication,
17 excessive arcing due to the misalignment of blades, and in the case of SCADA switches,
18 failure of batteries – all of which can lead to switch malfunction, and pose a risk of injury
19 to Toronto Hydro employees.

1 Between 2020 and 2022, Toronto Hydro identified on average 38 switch-related
2 deficiencies annually. These deficiencies are addressed by overhead switch maintenance
3 activities such as identifying and correcting deteriorated insulators and corroded switch
4 blades, ensuring blades are properly aligned, lubricating switches, and replacing batteries
5 proactively. Deficiencies requiring further follow-up action or replacement of the switch
6 are addressed in the Corrective Maintenance or Reactive and Corrective Capital
7 programs.¹⁰

8
9 From a system reliability perspective, reducing the likelihood of switch failures can reduce
10 the number of CIs and CHIs. Between 2020 and 2022, Toronto Hydro’s distribution system
11 experienced on average approximately 30 power interruptions per year due to switch
12 failures, which resulted in more than 46,000 CIs and 24,000 CHIs annually. Switches are
13 designed to isolate line sections from the distribution system when a fault occurs or for
14 the purposes of undertaking planned work. Their function and impact on system reliability
15 can be illustrated using the example in Figure 11 below.



16 **Figure 11: Example of Overhead Switch Impact on System Reliability**

17
18 Depicted above is a feeder that serves 2,000 customers, divided into two line sections
19 using a switch, with each section serving 1,000 customers. When a fault occurs on Line
20 Section 2, the switch can be operated to isolate that line section such that the station can
21 continue to supply the customers on Line Section 1. Without an operable switch, 2,000
22 CIs would result, as the feeder would be isolated in its entirety from the station.

¹⁰ *Supra* note 8.

1 Maintaining the switch in good working order has the potential to reduce that number to
2 1,000 CIs as only Line Section 2 would be isolated. Assuming in this theoretical example
3 a fault is equally likely to occur on Line Section 1 or Line Section 2, an operable switch
4 would improve system reliability by 33 percent.

5 Approximately 2,500 locations contain porcelain insulators, which are at an increased risk
6 of contamination as they are close to industrial areas and busy arterial roads and
7 highways (such as the 401, 400, 427, and the Don Valley, Allen, and Gardiner
8 Expressways), where salt used to melt snow or ice in the winter months becomes airborne
9 through “salt spray” and deposits on the insulators.

10

11 Removing contamination through insulator washing reduces the risk of electrical tracking,
12 pole fires, and insulator failures. From a safety perspective, pole fires and insulator
13 failures in Toronto’s dense urban areas can cause injury to individuals at ground level and
14 crew members working near the insulators. The primary failure mode for porcelain
15 equipment is cracking, which may start as a hairline crack, but has the potential to lead
16 to a catastrophic failure with shards of debris falling to the ground and striking anyone in
17 the vicinity and an arc flash risk to workers nearby. Figure 12 below shows a close-up
18 view of a porcelain insulator damaged by electrical tracking over time.



19

Figure 12: Close-up of Damaged Porcelain Insulator Showing Tracking

1 From a system reliability perspective, insulator failures, depending on where they occur
2 on a feeder, will cause a power interruption for tens to possibly thousands of customers.
3 On March 3, 2015, Toronto Hydro experienced an all-time high of 121 pole fires, caused
4 by a freezing rain storm event. These pole fires impacted approximately 107,000
5 customers and resulted in approximately 292,000 CHI's. The cause of the fires was a
6 combination of the higher moisture levels caused by freezing rain and the build-up of salt
7 used on roads, which became airborne and accumulated on the insulators. This
8 combination of factors can significantly increase the risk of a pole fire. See Figure 13
9 below.



10 **Figure 13: Pole fire on December 22nd, 2017**

11

12 From a financial perspective, pole fires resulting from insulator tracking necessitate
13 emergency response, equipment replacement, and in some instances, the payment of
14 damage claims. Emergency response costs incurred by Toronto Hydro for the March 3,
15 2015 freezing rain event totalled \$1.5 million.

1 In response to this event, Toronto Hydro developed a reactive insulator washing program,
2 which involves additional system wide insulator washing of all high risk pole locations on
3 a reactive basis, based on weather patterns and road salt usage trends. This work is
4 funded through the Corrective Maintenance program.¹¹ Since this Program began,
5 Toronto Hydro has not seen pole fires at 2015 levels. From 2020-2022, Toronto Hydro has
6 been averaging approximately 20 pole fires per year which represents a significant
7 reduction from the total number of poles fires in 2015.

8

9 Given the risks associated with contaminated porcelain insulators (including public and
10 employee safety, system reliability, and financial risks), routine insulator washing is a
11 necessary and prudent means of reducing the likelihood of contingencies resulting from
12 debris build-up on insulators. Reductions in the amount of insulator washing could result
13 in increased incidents of insulator tracking and poles fires.

14

15 As porcelain insulators are naturally phased out of the system and replaced with polymer
16 insulators, the need for insulator washing is expected to diminish in the long-term, as
17 polymer insulators are hydrophobic and are not susceptible to the same failure mode due
18 to contamination. In the short-term however, continued insulator washing is expected to
19 be required.

20

21 **6.2 Overhead Switch Maintenance and Insulator Washing Segment Costs**

22 Table 5 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
23 (2025-2029) expenditures for this segment.

¹¹ *Supra* note 5.

1 **Table 5: Overhead Switch Maintenance and Insulator Washing Segment Expenditures**
 2 **(\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Overhead Switch Maintenance & Insulator Washing	1.4	1.6	1.3	1.6	1.7	2.4	2.4	2.5	2.6	2.6

3 **6.3 Overhead Switch Maintenance and Insulator Washing Segment Year-over-Year**
 4 **Variance Analysis**

5 2020 – 2021 Variance Explanation

6 Expenditures increased by approximately \$0.2 million from 2020 to 2021, which was
 7 primarily attributed to an increase in unit prices to maintain all overhead switches and an
 8 increase in switch batteries replaced.

10 2021 – 2022 Variance Explanation

11 Expenditures decreased by approximately \$0.2 million from 2021 to 2022, which was
 12 primarily attributed to a decrease in the number of switch batteries replaced.

14 2022 – 2025 Variance Explanation

15 Between 2022 and 2025, expenditures are expected to increase by approximately \$1.1
 16 million, or an average of \$0.4 million per year, which is primarily attributed to an increase
 17 in the number of overhead switches scheduled for maintenance in order to achieve a six-
 18 year inspection cycle.

20 2025 – 2029 Variance Explanation

21 Between 2025 and 2029, expenditures are expected to increase by approximately \$0.2
 22 million, or an average of less than \$0.1 million per year, primarily due to inflation partially

1 offset by decreases in the number of insulators to be washed. If Toronto Hydro were
2 forced to deliver this segment with a reduced level of funding over the 2025-2029 rate
3 period, the utility could face various risks, including:

- 4 • Reduced ability to comply with applicable legislative and regulatory requirements
5 such as the OEB’s Minimum Inspection Requirements.¹²
- 6 • Increased frequency of equipment malfunctions or failures due to unidentified
7 deficiencies or lack of maintenance leading to increased:
 - 8 ○ safety risks from incidents such as the collapse of a pole onto a roadway,
9 sidewalk or residence, or flashovers on electrical equipment;
 - 10 ○ environmental risk from oil leaks resulting from unidentified equipment
11 deficiencies such as corrosion on the transformer tank; and
 - 12 ○ reliability risks from the failure of overhead switches or other equipment,
13 which result in outages or interruptions caused by overgrown trees, which
14 can result in outages.

15 16 **7. VEGETATION MANAGEMENT**

17 **7.1 Segment Description**

18 Toronto Hydro performs vegetation management on over 860 overhead primary feeders
19 extending almost 4,800 circuit kilometres along Toronto’s arterial thoroughfares, rights-
20 of-way, and residential streets. These feeders co-exist with the City of Toronto’s mature
21 and dense tree canopy, which includes about 600,000 City-owned “street trees” and
22 thousands of trees located on customer properties. In total, there are over ten million
23 trees in the City of Toronto. Over 125,000 of these street trees are adjacent to primary
24 overhead feeders, and their overgrowth can potentially interfere with the safe and
25 reliable distribution of electricity.

¹² *Supra* note 1.

1 Planned vegetation management activities are executed by contractors with support
2 from Toronto Hydro’s internal resources. Trees and branches are pruned according to
3 minimum clearance standards based on American National Standards Institute (“ANSI”)
4 A300 – Standard Practices for Trees, Shrubs and other Woody Plant Maintenance,¹³ and
5 the City of Toronto Forestry Pruning Guidelines. In addition to the minimum clearance
6 standards, Toronto Hydro considers other factors such as:

7

- 8 • **Species and growth patterns of a tree:** Fast-growing trees are trimmed more and
9 slow-growing trees are trimmed less;
- 10 • **Natural trimming practices:** Branches are pruned back to a natural point of
11 growth in the crown of the tree and leaders are “trained” (shaped) to grow away
12 from the lines;
- 13 • Distance of major limbs that exhibit minimal growth, versus minor branches that
14 can exhibit aggressive growth;
- 15 • **Directional pruning practices:** Maintenance of tree shape and branch patterning;
- 16 • Overall aesthetics and balance of the tree;
- 17 • Removal of dead limbs; and
- 18 • **Storm hardening:** Select removal of branches within the canopy to minimize the
19 possible effects of wind and severe weather, but maintain the overall tree
20 appearance.

21

22 Toronto Hydro avoids the practice of “tree topping”, which is the indiscriminate removal
23 of branches to reduce the size of the tree crown. As a result, and given the above-noted
24 factors, Toronto Hydro mandates the use of certified utility arborists for vegetation

¹³ American National Standards Institute, *American National Standard for Tree Care Operations — Tree, Shrub, and Other Woody Plant Maintenance — Standard Practices (Pruning)*, (A300 (Part 1) -2001).

1 management activities with training, knowledge, and certification in the practice of
2 arboriculture.
3 Vegetation management mitigates the risk of vegetation interference by pruning trees
4 near Toronto Hydro’s overhead feeders. Each year, Toronto Hydro identifies the feeders
5 in greatest need of tree pruning based on prioritization criteria such as feeder reliability
6 history, number of customers supplied by each feeder, and the amount of time that has
7 elapsed since the trees surrounding the feeder were last pruned. The prioritization
8 process results in pruning trees surrounding feeders once every two to five years, with
9 the system average being approximately three years. On average, Toronto Hydro pruned
10 1,399 circuit kilometres and approximately 47,000 trees annually between 2020 and
11 2022.



12 **Figure 14: Tree Trimming of an Overhead Feeder**

13
14 Vegetation interference is one of the most common causes of power interruptions, as
15 overhead feeders are prone to tree branch contacts. Trees may make contact with
16 distribution feeders as a result of natural growth, or when severe weather causes
17 branches to break and fall onto lines or to bend and make intermittent contact.
18 Conductors on feeders can also naturally stretch and sag due to ice and snow build-up,
19 heavy loading or warm weather, bringing the lines closer to tree limbs. Branch contacts
20 with lines result in a new path for current to travel, causing the branch to become
21 energized, and posing a safety risk.

1 Vegetation-related power interruptions have a significant impact on system reliability and
2 are among the leading causes of system outages. Statistics from 2020 to 2022 show that
3 tree contacts are responsible for nearly 100 power interruptions a year, and cause
4 approximately 116,000 CIs and 117,000 CHIs annually. When all interruptions are
5 considered, over the period of 2020-2022, trees accounted for approximately nine
6 percent of all CIs and 16 percent of all CHIs annually on average. These statistics exclude
7 interruptions that occurred on major event days. During such days, the distribution
8 system is particularly vulnerable to tree contacts and costly tree damage.

9

10 As more time passes since the last tree pruning for a particular feeder, it becomes more
11 likely that tree contacts will occur and associated risks will increase (including system
12 reliability, financial, and safety risks). These risks can be effectively mitigated through
13 tree trimming.

14

15 From a reliability standpoint, Figure 15 illustrates the average number of sustained
16 outages per feeder relative to time elapsed since the last pruning and trimming activities.
17 This figure shows that the more time that passes from when a feeder was last trimmed,
18 the higher the number of sustained outages are observed for that feeder, which is
19 forecasted to continue to increase as more time elapses from the last trimming.

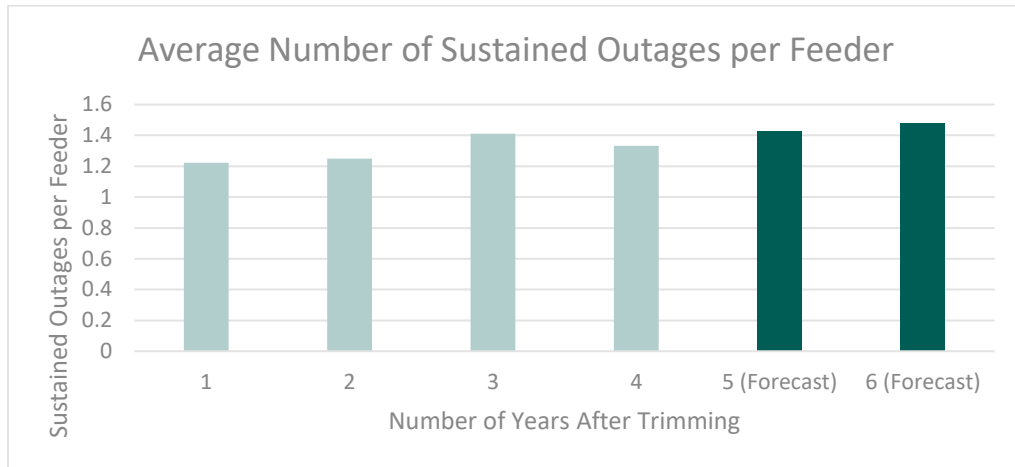


Figure 15: Average Number of Sustained Outages Per Feeder

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18

Vegetation management is also a widely accepted means of effectively “storm-hardening” a system (i.e. proactively mitigating against storm damage and associated system reliability risks). Storm hardening involves selectively removing portions of a tree canopy to reduce the “sail effect” of branches during high winds and to reduce the likelihood that broken branches will make contact with lines. As such, more frequent tree pruning further reduces risks posed by severe weather.

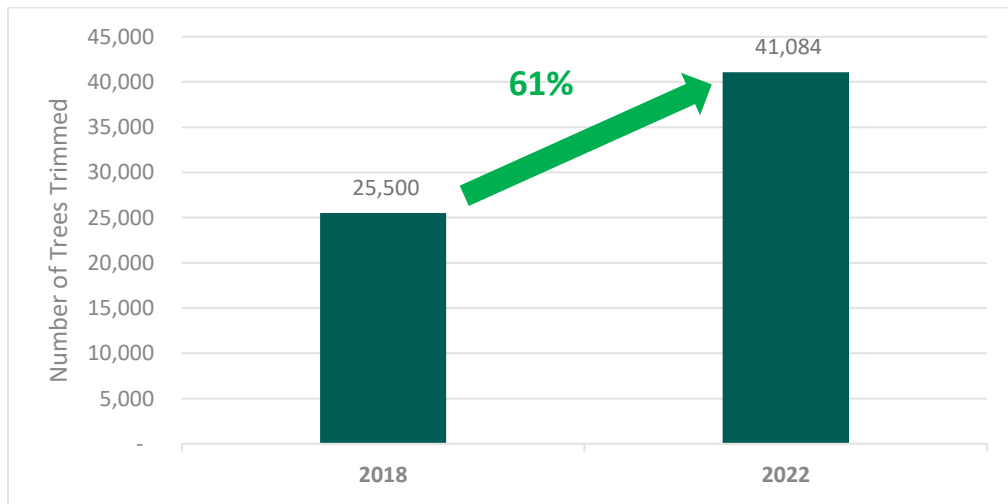
Toronto Hydro’s system is susceptible to severe weather and storm damage, as evidenced by the 2013 ice storm and more recently the May 21st, 2022 wind storm. In many cases, the effects of these storms continue well after the storm has passed. Broken and weakened trees and tree limbs continue to pose a threat to overhead lines until the next tree pruning date. From a financial perspective, planned vegetation management is expected to reduce reactive expenditures from corrective and emergency responses.

In addition to system reliability and financial risks, vegetation management serves to mitigate safety risks, including as a result of trees and vegetation that grows or is blown

1 into power lines. This vegetation can become energized, and in certain situations, can
2 cause fires or step and touch potential risks to the general public. Another safety risk
3 stems from branches or trees that bring energized conductors to the ground when they
4 fall, which pose significant safety hazards to the public. Vegetation management is
5 expected to mitigate these risks.

6

7 Under the City's Strategic Forest Management Plan, the City's tree canopy cover is
8 expected to grow from 28 percent to 40 percent. The outcome of this initiative is evident
9 from Toronto Hydro's Vegetation Management program (see Figure 16), where the
10 number of trees trimmed for the same feeders has increased by approximately 61 percent
11 from 2018 to 2022. The growing tree canopy will only increase the need for a robust
12 Vegetation Management program in order to maintain tree growth and mitigate the risk
13 of tree contacts with overhead distribution lines.



14 **Figure 16: Tree count for feeders trimmed in 2018 versus the same feeders trimmed in**
15 **2022**

16 Toronto Hydro is piloting multiple technologies, such as LiDAR and satellite imagery to
17 assess vegetation encroachment near overhead primary conductors. The objectives of

1 these pilots is to reduce vegetation-related outages by adopting a data and condition-
 2 based approach for feeder-based tree trimming.

3
 4 **7.2 Vegetation Management Segment Costs**

5 Table 6 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 6 (2025-2029) expenditures for this segment.

7
 8 **Table 6: Vegetation Management Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Vegetation Management	2.8	3.4	3.5	3.5	3.8	4.0	4.1	4.2	4.3	4.4

9
 10 **7.3 Vegetation Management Segment Year-over-Year Variance Analysis**

11 2020 – 2021 Variance Explanation

12 Expenditures increased by approximately \$0.6 million from 2020 to 2021, which was
 13 primarily attributed to an increase in the number of kilometers of feeder trimmed.

14
 15 2021 – 2022 Variance Explanation

16 Expenditures increased by approximately \$0.1 million from 2021 to 2022, which was
 17 primarily attributed to an increase in the number of kilometers of feeder trimmed.

18
 19 2022 – 2025 Variance Explanation

20 Between 2022 and 2025, expenditures are expected to increase by approximately \$0.5
 21 million, or an average of \$0.2 million per year, primarily due to inflationary pressures.

1 2025 – 2029 Variance Explanation

2 Between 2025 and 2029, expenditures are forecast to increase by \$0.4 million, or an
3 average of \$0.1 million per year, due to inflationary pressures. If Toronto Hydro were
4 forced to deliver this segment with a reduced level of funding over the 2025-2029 rate
5 period, the utility could face various risks, including:

6

- 7 • Reliability risks from interruptions caused by overgrown trees;
- 8 • Extreme weather related risks due to inability to storm harden the system by
9 reducing likelihood that broken branches will make contact with lines during high
10 winds;
- 11 • Safety risks due to branch contacts with lines causing branches to become
12 energized, potentially causing fires and step and touch potential risks; and
- 13 • Financial risks due to increased spending on corrective or emergency responses.

14

15 **8. METERING SERVICES SEGMENT**

16 **8.1 Segment Description**

17 Toronto Hydro and its customers rely on metering equipment to accurately measure and
18 provide on a timely basis electricity consumption information for customer billing and
19 market settlement purposes. The Metering Services segment is responsible for
20 maintaining this equipment to ensure proper functionality and compliance with
21 applicable legislative and regulatory requirements.

22

23 Toronto Hydro's metering assets include both meters and the communication systems
24 that enable meter data collection and tracking. The maintenance of metering equipment
25 is critical to ensuring the ongoing accuracy of meter reads and the associated billing and
26 settlement data. Moreover, meter testing is a requirement under the *Electricity and Gas*

1 *Inspection Act* administered by Measurement Canada.¹⁴ Metering Services maintains
2 Toronto Hydro's 798,000 smart and suite meters and 222 wholesale meter installations,
3 examples of which are illustrated in Figures 17 and 18 below.



**Figure 17: Smart Meter Installation at
Customer Location.**



**Figure 18: Wholesale Meter Installation
at Transformer Station.**

4
5 Metering Services activities consist of three major functional categories: (i) Meter
6 Sampling & Testing; (ii) Wholesale Meter Maintenance; and (iii) Field Response.

7
8 **8.1.1 Meter Sampling and Testing**

9 Toronto Hydro is required to comply with the metering requirements set out in and
10 pursuant to legislation administered by Measurement Canada, which requires that all
11 meters must be resealed at specific intervals in order to ensure that customers' electricity
12 use is metered accurately. The Toronto Hydro meter sampling and testing program
13 verifies the accuracy of meters, ensuring compliance with applicable requirements under
14 the *Electricity and Gas Inspection Act* and the *Weights and Measures Act*.¹⁵ These statutes

¹⁴ *Supra* note 2.

¹⁵ *Supra* note 2 and 3.

1 permit the use of meters for a set period of time, also referred to as a “seal period”, before
2 they must be either tested (i.e. re-verified) or replaced. For smart meters, this time span
3 is typically ten years. When meters are tested and re-verified for accuracy, the seal period
4 is extended.

5

6 For meter testing purposes, Measurement Canada permits utilities to form isolation lots
7 (i.e. groups of meters with homogeneous meter characteristics), and test only a small
8 number (called the sample group) from the isolation lot. Typically, 2-5 percent of
9 randomly selected meters from each isolation lot form the sample group. For smaller
10 homogeneous lots, the sampling rate could be as high as 50 percent. These sampling rates
11 are allowed given the large number of meters in-service. The number of meters to be
12 tested is determined in accordance with Measurement Canada’s specification S-S-06,
13 *Sampling Plans for the Inspection of Isolated Lots of Meters in Service*.¹⁶ The seal period
14 of the isolation lot of meters can be extended if the accuracy statistics for the sample
15 group meet tolerances stipulated in Measurement Canada’s specification. Some unique
16 meters do not belong to any isolation lot and must be removed from service and tested
17 individually before their seal periods expire. Table 7 lists the number of meters with a seal
18 period that will expire during the 2025-2029 rate period. It also lists the number of meters
19 that will need to be sampled or re-verified so as to comply with Measurement Canada’s
20 requirements. The sampling units accounts for meters that will be replaced through
21 capital investments in the Metering program, including through Toronto Hydro’s
22 Advanced Metering Infrastructure (“AMI”) 2.0 initiative.¹⁷

¹⁶ See Annex C, Table 2, Limiting Quality 3.15.

¹⁷ Exhibit 2B, Section E5.4.

1 **Table 7: Number of Seal Expiring Meters in 2025-2029 and Sampling Units**

Year	Seal-Expiring Meters	Sampling/Re-verification units
2025	196,127	10,464
2026	155,463	13,201
2027	70,968	14,783
2028	68,151	15,396
2029	28,242	11,311
Total	518,951	65,155

2 In conducting meter testing, Toronto Hydro relies on field crews to remove meters that
 3 are part of a sample group and return them to Toronto Hydro’s accredited service
 4 provider for testing. Test results are forwarded to Toronto Hydro for documentation and
 5 further actions based on the test results. A pass will result in an update to the meter
 6 records and the extension of seal periods, based on the tested accuracy levels. For the
 7 utility’s smart meters with a ten-year initial seal period, provided the meters pass testing,
 8 the seals will be extended for all of the meters within the group by an additional eight
 9 years.

10

11 **8.1.2 Wholesale Meter Maintenance**

12 Wholesale meters, including instrument transformers, are installed at transmission grid
 13 supply points to measure electricity supplied from Hydro One Networks Inc. (“Hydro
 14 One”) to Toronto Hydro. Wholesale meter maintenance involves re-verifying (i.e. testing
 15 every eight years) and troubleshooting wholesale meters, and ensuring compliance with
 16 all applicable regulations, such as the requirement to notify the Independent Electricity
 17 System Operator (“IESO”) of Meter Trouble Reports within 48 hours pursuant to the
 18 IESO’s Market Rules and Market Manual.

19

20 Meter Trouble Reports are issued if there is any failure in data communication or if the
 21 data is suspected to contain errors. Data communication failures can arise from issues

1 with Toronto Hydro's wireless 4G private network, the meter itself, or the modem. If such
2 a failure occurs, Toronto Hydro attempts to resolve the issue remotely. If remote
3 resolution is unsuccessful, Toronto Hydro deploys field crews to the site of the particular
4 wholesale meter to address the issue directly.

5
6 *8.1.3 Field Response*

7 The third category of activities within Metering Services is Field Response, which includes
8 activities such as:

- 9
- 10 • Testing the accuracy of large user meter installations;
 - 11 • Converting legacy flat rate services (e.g. Water heaters) into metered activities;
12 and
 - 13 • Installing reused meters following accuracy testing.

14 Toronto Hydro's 691,000 smart meters have a failure rate of 0.9 percent (i.e.
15 approximately 6,200 units annually). Toronto Hydro's 94,000 suite meters have a failure
16 rate of 2 percent (i.e. approximately 1,700 annually). The majority of the failures are
17 related to: (i) the use of radio frequency mesh technology for smart meters; (ii) powerline
18 carrier for suite meters, to deliver the meter reading data back to Toronto Hydro's
19 centralized meter reading software and (iii) hardware failure of suite meters. As failures
20 occur, staff and field crews must investigate failure causes and restore communications
21 in a timely manner, as well as perform on-site interval energy data downloads to maintain
22 time sensitive billing (time-of-use).

23
24 Overall, a significant portion of the work undertaken by Metering Services is not
25 discretionary because it is either driven by statutory or regulatory obligations, or a need
26 to resolve a meter issue in the field on a reactive basis.

1 **8.2 Metering Services Segment Costs**

2 Table 8 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 3 (2025-2029) expenditures for this segment.

4
 5 **Table 8: Metering Services Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Metering Services	1.1	0.7	0.4	1.6	1.8	1.9	1.9	2.0	1.7	1.5

6

7 **8.3 Metering Services Segment Year-over-Year Variance Analysis**

8 2020 – 2021 Variance Explanation

9 Expenditures decreased by approximately \$0.4 million from 2020 to 2021, primarily due
 10 to obsolete meter models that could not be reused and therefore were not sampled or
 11 reverified.

12

13 2021 – 2022 Variance Explanation

14 Expenditures decreased by approximately \$0.3 million from 2021 to 2022, mainly due to
 15 lower maintenance activities for transformer station metering and reduced number of
 16 reused meter changes as obsolete meter models were being replaced with new meters.

17

18 2022 – 2025 Variance Explanation

19 Between 2022 and 2025, expenditures are expected to increase by \$1.5 million, or an
 20 average of \$0.5 million per year, primarily due to higher volumes of suite maintenance
 21 activities and meter testing and resealing and operational costs related to Toronto
 22 Hydro’s AMI 2.0 initiative.

1 2025 – 2029 Variance Explanation

2 Between 2025-2029, expenditures are forecast to decrease by \$0.4 million, or an average
3 of \$0.1 million per year, primarily due to lower meter sampling costs and reduced
4 operational costs. If Toronto Hydro were forced to deliver this segment with a reduced
5 level of funding over the 2025-2029 rate period, the utility could face various risks,
6 including:

- 7 • Reduced ability to comply with applicable legislative and regulatory requirements
8 such as Measurement Canada’s metering requirement; and
- 9 • Worsening customer service performance due to inaccurate or delayed billing of
10 customers based on usage.

1 **PREVENTATIVE AND PREDICTIVE UNDERGROUND LINE MAINTENANCE**

2

3 **1. OVERVIEW**

4 **Table 1: Preventative and Predictive Underground Line Maintenance Program**

5 **Summary**

Preventative and Predictive Underground Line Maintenance Program									
Outcomes: Operational Effectiveness - Reliability, Environment, and Operational Effectiveness – Safety									
Segments:									
<ul style="list-style-type: none"> • Below-Grade Equipment Maintenance • Padmounted Equipment Maintenance • Cable Diagnostic Testing • Contact Voltage Scanning 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
5.1	4.4	5.7	6.3	6.1	6.8	7.0	6.7	7.1	7.0

6

7 The Preventative and Predictive Underground Line Maintenance program (the
 8 “Program”) funds maintenance activities on Toronto Hydro’s underground assets. This
 9 Program involves inspection and maintenance tasks typically conducted on a fixed cycle
 10 and inspection of equipment for predetermined conditions indicative of a potential
 11 failure. The activities comprising the individual segments in this Program are focused on
 12 preserving and maximizing the performance of assets over their expected useful life while
 13 mitigating a wide variety of system risks. This Program is also designed to minimize
 14 overall costs and account for other factors such as the safety of Toronto Hydro’s work
 15 crew and the public, and statutory and regulatory requirements.¹ The Preventative and
 16 Predictive Underground Line Maintenance program is comprised of the following four
 17 segments:

¹ *Distribution System Code, Appendix C (August 2, 2023).*

- 1 • **Below-Grade Equipment Maintenance:** this segment includes the periodic
2 inspection and maintenance of all underground vaults such as network vaults,
3 compact radial distribution (“CRD”) vaults, underground residential distribution
4 (“URD”) vaults, submersible vaults, cable chambers, and equipment housed within
5 them.
- 6 • **Padmounted Equipment Maintenance:** this segment includes the periodic
7 inspection of padmounted equipment (e.g. transformers, switches), which form
8 part of Toronto Hydro’s underground distribution system.
- 9 • **Cable Diagnostic Testing:** this segment involves performing diagnostic testing on
10 cables installed in Toronto Hydro’s underground system to provide a more
11 accurate assessment of the condition of underground cables, splices, joints, and
12 terminations.
- 13 • **Contact Voltage Scanning:** this segment addresses includes the periodic scanning
14 of Toronto Hydro’s distribution system for contact voltage, which results from an
15 unintentional connections between structures or surfaces (e.g. bus shelters,
16 surfaces above buried distribution equipment) and Toronto Hydro’s distribution
17 system. The main activity in this segment involves using vehicle mounted mobile
18 scanning tools to scan for stray voltages from electrical connections and
19 terminations that potentially energize poles, bus shelters etc., due to exposure to
20 weather elements, thereby creating public safety hazards.

21

22 By preserving and maximizing the performance of underground assets, and reducing risks
23 associated with its operation, this Program contributes to maintaining safety,
24 environmental responsibility, and overall system reliability at a reasonable cost to
25 Toronto Hydro’s customers.

1 **2. OUTCOMES AND MEASURES**

2 **Table 2: Preventative and Predictive Underground Line Maintenance Program**

3 **Outcomes and Measures Summary**

Operational Effectiveness - Reliability	<ul style="list-style-type: none"> • Contribute to maintaining existing levels of system reliability – as measured by performance metrics like SAIDI, SAIFI, Customers Interrupted (“CI”), and Customer Hours Interrupted (“CHI”) – through the effective inspection and maintenance of underground assets for deficiencies in compliance with the Ontario Energy Board’s (“OEB”) Distribution Systems Code (“DSC”).
Environment	<ul style="list-style-type: none"> • Contribute to reducing the environmental impact of Toronto Hydro’s distribution system by proactively identifying transformers exhibiting signs of oil deficiencies or padmounted switches leaking SF₆ gas for replacement, thereby reducing the likelihood of these contaminants from entering the environment.²
Operational Effectiveness - Safety	<ul style="list-style-type: none"> • Contribute to Toronto Hydro’s safety objectives (including compliance with Ontario Regulation 22/04, and safety performance as measured through the Serious Electrical Incidents Index) by:³ <ul style="list-style-type: none"> ○ minimizing public exposure to contact voltage by finding and eliminating energized (4.5 volts or greater) surfaces and structures on Toronto Hydro’s distribution system; and ○ minimizing exposure to blown cable chamber lid incidents through prompt identification and resolution of failing cables that can result in electrical faults leading to these incidents.

4

5 **3. PROGRAM DESCRIPTION**

6 The Preventative and Predictive Underground Line Maintenance program funds
 7 maintenance activities on Toronto Hydro’s underground assets. This Program involves
 8 inspection and maintenance tasks typically conducted on a fixed cycle and inspection of
 9 equipment for predetermined conditions indicative of a potential failure. The activities
 10 comprising the individual segments in this Program are focused on preserving and

² Approximately 600 oil deficiencies (e.g. leaking underground transformers) were found and reported between 2020 and 2022.

³ Ontario Regulation 22/04: Distribution System Safety, under *Electricity Act*, SO 1998, Ch 15, Schedule A.

1 maximizing an the performance of assets over their expected useful life while mitigating
2 a wide variety of system risks. Tasks in this Program are also designed to minimize overall
3 costs and account for factors such as the safety of Toronto Hydro crews and the public,
4 and statutory and regulatory requirements.

5

6 Maintenance activities include vault and cable chamber inspections to assess the
7 condition of civil structures and the equipment housed inside (e.g. transformers,
8 switches, and cables), inspections of padmounted transformers and switches; cable
9 diagnostic testing for underground cables; and contact voltage scanning for stray voltages
10 across the distribution system.

- 11 • **Below-Grade Equipment Maintenance:** this segment funds the periodic
12 inspection and maintenance of all underground vaults such as network vaults,
13 compact radial distribution (“CRD”) vaults, underground residential distribution
14 (“URD”) vaults, submersible vaults, cable chambers, and equipment housed within
15 them.
- 16 • **Padmounted Equipment Maintenance:** this segment funds the periodic
17 inspections of padmounted equipment (e.g. transformers, switches).
- 18 • **Cable Diagnostic Testing:** this segment funds the diagnostic testing on cables
19 installed in Toronto Hydro’s underground system to provide a more accurate
20 assessment of the condition of underground cables, splices, joints, and
21 terminations.
- 22 • **Contact Voltage Scanning:** this segment funds the periodic scanning of Toronto
23 Hydro’s distribution system for contact voltage, which results from an
24 unintentional connections between structures or surfaces (e.g. bus shelters,
25 surfaces above buried distribution equipment etc.) and Toronto Hydro’s
26 distribution system. The main activity in this segment is the use of vehicle

1 mounted mobile scanning tools to scan for stray voltages from electrical
 2 connections and terminations that potentially energize poles, bus shelters etc.
 3 due to exposure to weather elements, thereby creating public safety hazards.

4
 5 **4. PROGRAM COSTS**

6 In 2025, Toronto Hydro requires \$6.8 million in rate funding for the Preventative and
 7 Predictive Underground Line Maintenance program, which represents an increase of \$1.7
 8 million over the previous rate period in 2020.

9
 10 Over the 2025-2029 rate period, the utility expects the cost of this program to increase
 11 by a compounded annual growth rate of 1.1 percent, which is necessary to address
 12 underground line maintenance needs and deliver the customer outcomes enabled by this
 13 program.

14
 15 The Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-2029) expenditures
 16 for each segment are summarized in Table 3 below.

17
 18 **Table 3: Preventative and Predictive Underground Line Maintenance Program**
 19 **Expenditures by Segment (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Below-Grade Equipment Maintenance	2.5	2.9	3.0	3.5	3.2	3.5	3.6	3.3	3.5	3.5
Padmounted Equipment Maintenance	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
Cable Diagnostic Testing	-	0.3	0.4	0.6	0.6	0.7	0.8	0.8	0.8	0.8
Contact Voltage Scanning	2.0	0.7	1.8	1.7	1.8	2.0	2.0	2.0	2.2	2.1
Total	5.1	4.4	5.7	6.3	6.1	6.8	7.0	6.7	7.1	7.0

1 **4.1 Cost Drivers**

2 Cost variances are partly attributed to varying numbers of units scheduled for inspections
3 each year based on their inspection cycle. For example, in the Below–Grade Equipment
4 Maintenance segment, the number of submersible vaults due for maintenance increased
5 from 2,500 locations in 2021 to 3,244 locations in 2022 (an increase of 30 percent).
6 Similarly, in the Padmounted Equipment Maintenance segment, Toronto Hydro inspected
7 more padmounted transformers, from 2,157 units in 2021 to 2,422 units in 2022. In the
8 Cable Diagnostic Testing segment, costs are increasing as this is a relatively new segment
9 and testing is steadily ramping up.

10

11 **4.2 Cost Control and Productivity Measures**

12 **4.2.1 Cost Management**

13 Toronto Hydro continually looks to optimize its work coordination process. For example,
14 Toronto Hydro’s Cable Diagnostic Testing program in the downtown core aims to
15 coordinate testing with station maintenance cycles. As the program matures, multiple
16 feeders will be able to be coordinated at the same station for testing to eliminate the
17 need for additional outages and site visits, thereby reducing costs.

18

19 As of 2027, Toronto Hydro’s network vaults will have sensors providing remote
20 monitoring and control through the Network Condition Monitoring and Control (“NCMC”)
21 program.⁴ Network monitoring will complement the inspections of network vaults and
22 will reduce the number of on-site inspections required, yielding costs savings from the
23 adjustment of maintenance cycles for the civil structure of network vaults from 6 months
24 to 1 year.

⁴ Exhibit 2B, Section E7.3.

1 For the Contact Voltage segment, Toronto Hydro adjusted the inspection cycle to be
2 performed on a per ward basis, implementing risk-based maintenance principles. Instead
3 of scanning the entire city on an annual basis, only wards deemed to be higher risk are
4 scanned each year. The remaining lower risk wards, i.e. those located outside of
5 downtown and with fewer historical voltage contact hits, are scanned every three years.
6 This change has yielded direct cost savings from the reduction in overall scanning activity
7 each year.

8

9 *4.2.2 Productivity*

10 Toronto Hydro has placed significant emphasis on achieving greater output for the same
11 or reduced input in each of the segments within the Preventative and Predictive
12 Underground Line Maintenance program. Toronto Hydro continues to rely on its
13 Reliability Centered Maintenance (“RCM”) approach, pursuant to which it adjusts
14 maintenance tasks and frequencies based on RCM and Condition-Based Maintenance
15 (“CBM”) principles. Examples of these adjustments include:

- 16 • Continuously updating inspection forms and implementing CBM to allow for the
17 capturing of greater details about substandard conditions or deficiencies found
18 during inspections. These updates enable better prioritization and determination
19 of the most appropriate corrective action for each deficiency to better mitigate
20 public and employee safety, as well as environmental, system reliability, and
21 financial risks.
- 22 • Standardizing the scheduling of outage-based activities to align with station
23 maintenance cycles wherever possible to minimize the need for multiple outages
24 (and significant switching resources), enable bundling of maintenance work, and
25 minimize the need for multiple trips to particular sites.

- 1 • Implementing “find and fix” protocols whereby crews that identify minor asset
2 deficiencies also address the deficiencies on site (through actions such as
3 lubricating components, replacing faulted circuit indicators, replacing sump
4 pumps, clearing drains, caulking ducts and roof slabs, and replacing defective
5 locks, hinges or handles) as opposed to only logging the deficiencies for the
6 Corrective Maintenance program.
- 7 • Introducing new tools or making greater use of technology such as 3D imaging and
8 modelling of underground structures, Cable Diagnostic Testing, Contact Voltage
9 Scanning, Infrared Thermography, Electronic Maintenance Sheets, and Online
10 Partial Discharge Testing.
- 11 • Improve the method of selecting assets for inspections through the adoption of
12 CBM principles based on an asset’s health and condition history.

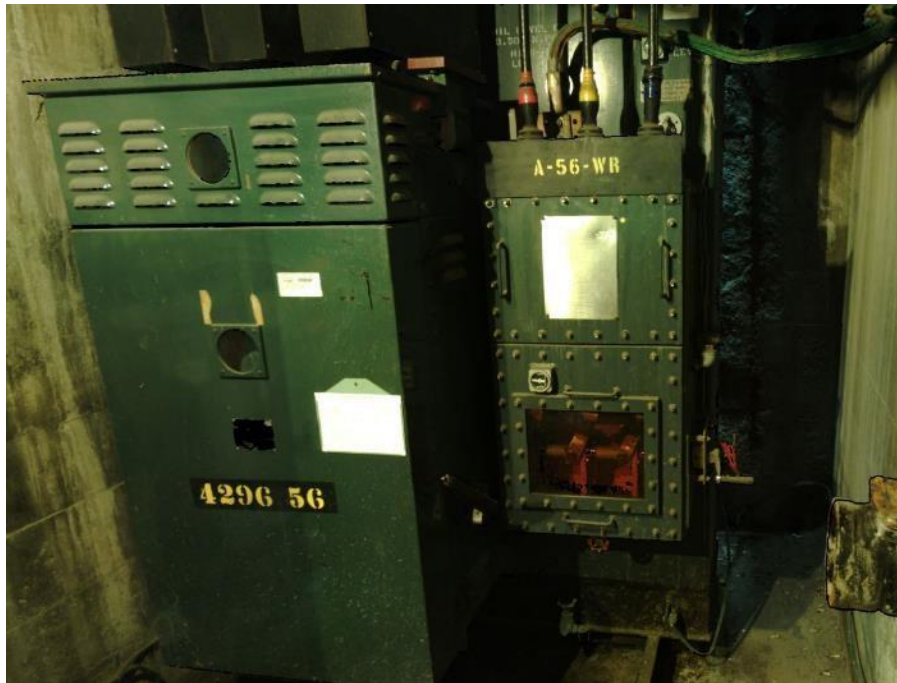
13
14 The following sections describe and discuss the drivers of each of the segments within the
15 Preventative and Predictive Underground Line Maintenance program.

16 17 **5. BELOW-GRADE EQUIPMENT MAINTENANCE SEGMENT**

18 **5.1 Segment Description**

19 This segment covers the inspection and maintenance of underground vaults and cable
20 chambers and the equipment housed within them. These below-grade structures are
21 constructed out of concrete or reinforced or un-reinforced concrete and house
22 transformers, switches, cables, and other electrical distribution equipment. Inspections
23 and maintenance activities are conducted on various types of below-grade structures
24 including network vaults, compact radial distribution (“CRD”) vaults, underground
25 residential distribution (“URD”) vaults, submersible vaults, and cable chambers.

1 Constructed in the 1950s and 1960s, network vaults are primarily located in the
2 downtown core of Toronto. These vaults are the largest of the below-grade structures,
3 and house interconnected electrical equipment used for the secondary network system
4 that provides reliable supply to large and critical customers in the city's dense downtown
5 core. The four main electrical components within network vaults are: (i) primary
6 switches, which isolate supply to transformers; (ii) transformers; (iii) network protectors,
7 which open when reverse power flow is sensed, preventing the secondary grid from
8 feeding a primary side fault; and (iv) fuse panels, which protect the cables feeding the
9 secondary grid. The transformer and the network protector are referred to as a network
10 unit, an example of which is illustrated in Figure 1. Toronto Hydro has over 1,040 network
11 vaults and 1,700 network units that require inspection and maintenance.



12 **Figure 1: A Network Unit**

13
14 The civil structures of network vaults is are currently inspected on a six-month cycle and
15 the electrical assets are inspected annually. Beginning in 2027, the inspection cycle for

1 the civil structures of network vaults will be adjusted from six months to annual. This
2 extended cycle is appropriate because all network vaults will be equipped with sensors
3 installed as part of the NCMC program. The NCMC program is expected to complement
4 the network inspections by providing remote monitoring and control for the network
5 distribution system. The real-time remote sensing capabilities will provide live operating
6 data for parameters such as temperature and water level within the vault, network
7 transformer oil temperature and oil levels, and network protector operation status, as
8 well as water levels inside the protector. With the implementation of NCMC across the
9 network distribution system, the real-time condition and loading data will allow Toronto
10 Hydro to proactively monitor operating conditions and effectively respond and
11 proactively address any potential hazards that are detected. Network protectors are also
12 inspected, cleaned, and functionally tested to ensure operability on a four-year cycle for
13 high voltage protectors, and a five-year cycle for low voltage protectors.

14

15 Toronto Hydro's CRD and URD systems were constructed in the early 1990s and 2000s,
16 respectively. CRD vaults were designed to be a cheaper lower-cost alternative to network
17 vaults because of their simpler design, and are typically used to supply small retail,
18 apartment, and commercial office buildings. URD vaults were built for 4 kV to 13.8 kV
19 conversion projects and are primarily used to power small residential or commercial
20 buildings. Toronto Hydro has a total of 780 CRD and URD vaults, which are inspected
21 annually.

22

23 Submersible vaults are small civil structures installed on public road allowances, or private
24 properties, and are used for residential distribution. These vaults contain submersible
25 transformers,⁵ switches, loop-through primary conductors, and secondary circuits. The

⁵ Submersible transformers are designed to function submerged under water for extended periods (but not indefinitely), although Toronto Hydro aims to keep water out of the submersible vaults through inspections.

1 vaults are sized to accommodate a transformer and secondary connections only. The
2 over 8,700 submersible transformer vaults in Toronto Hydro’s distribution system are
3 inspected on a three-year cycle. Figure 2 illustrates a submersible vault.



4 **Figure 2: Submersible Vault**

5
6 Cable chambers are civil structures are typically installed on public road allowances, and
7 contain primary and secondary cables, cable splices, and in many cases, third party
8 installations such as Toronto Transit Commission (“TTC”) power cables, television cables,
9 and phone lines. Located along the routes of underground feeders, cable chambers
10 facilitate cable installation in underground ducts. Toronto Hydro has over 11,400 cable
11 chambers that are inspected on a ten-year maintenance cycle. Beginning in 2025, Toronto
12 Hydro will be implementing condition-based maintenance for cable chambers in poor
13 condition as well as locations found to have deficiencies reported from Cable Diagnostic
14 Testing.

1 The Below-Grade Equipment Maintenance segment includes, for all types of vaults or
2 chambers, visual inspections of the civil infrastructure and electrical equipment,
3 thermographic scans, partial discharge testing, drainage, and sump pump tests.

4

5 The inspection cycles in this segment are designed to meet or exceed mandated cycles
6 specified by the OEB's Minimum Inspection Requirements (Appendix C to the Distribution
7 System Code).⁶

8

9 The useful life of below-grade structures (including all types of vaults described above and
10 cable chambers) is 60-65 years. The roofs of those structures however are expected to
11 last for only 25 years, due to greater exposure to the environment and dynamic loads
12 such as pedestrian and vehicular traffic. The equipment housed within below-grade
13 structures is expected to have an average life between 30 and 40 years depending on the
14 type of equipment.

15

16 The ages of Toronto Hydro's vaults vary from the relatively new URD and CRD vaults to
17 the older network vaults in the downtown areas of the city. Over 28 percent of all network
18 vaults will reach the end of their expected life within the next ten years, and the vast
19 majority of network vault roofs are already beyond their useful life. In addition, over 55
20 percent of cable chamber roofs are past their useful life.

21

22 As below-grade structures age, the greatest concern becomes structural strength.
23 Structural deficiencies affecting vaults include degradation of concrete and corrosion of
24 supports such as beams and rebar. Once degradation and corrosion set in, conditions can
25 deteriorate rapidly and in many cases from one season to the next. Of particular concern

⁶ *Supra* note 1.

1 is the winter season when moisture and water (often containing road salt) enter below-
2 grade structures and freeze and thaw. Figures 3 and 4 depict structural deficiencies that
3 are common in older vaults.



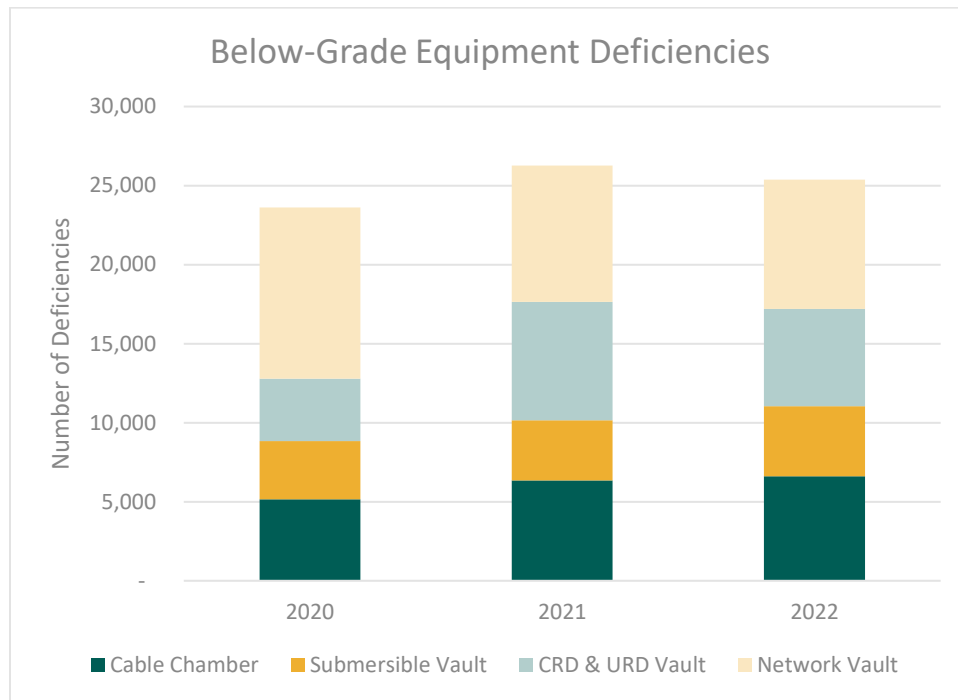
Figure 3: Crumbling Vault Roof with Exposed Rebar



Figure 4: Corroded I-Beams

4
5 Below-Grade Equipment Maintenance mitigates the risks that the deterioration of civil
6 and electrical assets poses, including public and employee safety, financial,
7 environmental, and system reliability risks. Toronto Hydro mitigates these risks by
8 identifying deficiencies in below-grade structures before they cause a failure. As
9 illustrated in Figure 5 below, Toronto Hydro has identified on average over 25,000
10 deficiencies each year between 2020 and 2022. This is an increase over the average
11 number of deficiencies found in the distribution system over 2015-2017 (approximately
12 12,000 deficiencies per year), which is partly attributed to enhancements made to

1 inspection forms in order to capture greater details and enable more informed decision-
 2 making on follow-up actions and the inclusion of deficiencies that are repaired during
 3 inspection.⁷ Toronto Hydro reviews these deficiencies to determine appropriate
 4 correction actions, and those that require corrective actions are addressed under the
 5 Corrective Maintenance and Reactive and Corrective Capital programs.⁸⁹



6
 7 **Figure 5: Below-Grade Equipment Deficiencies Identified Between 2020 and 2022**

8
 9 Below-grade structures are typically installed underneath roadways, pedestrian walkways
 10 and in residential neighbourhoods. Given their locations, it is important to identify and
 11 correct structural defects and potential failures proactively to mitigate potential safety
 12 risks to the public, such as trip hazards due to uneven elevation grading.

⁷ The average annual deficiencies for 2015-2017 did not include deficiencies fixed during inspections, which accounted for approximately 3,600 deficiencies per year over 2020-2025.

⁸ Exhibit 4, Tab 2, Schedule 4

⁹ Exhibit 2B, Section E6.7

1 In addition to the importance of their structural integrity, vaults must be maintained in a
2 relatively clean state, and contain appropriate nomenclature, functional lighting, and
3 drainage systems. Oil barrier devices installed in vault drains are also inspected and
4 replaced as required. Vaults are naturally ventilated using grates to ensure uninterrupted
5 ventilation. However, debris can enter over time, and, if not addressed, create slip and
6 fall hazards for employees.

7

8 From a financial risk perspective, inspections and maintenance mitigate the risk of costly
9 failures. For example, identifying a vault with significant dirt and debris (such as the one
10 depicted in Figure 6) enables corrective action to be taken and reduces the risk that the
11 debris will catalyse asset corrosion as shown in Figure 7, or potentially result in an arc
12 flash or fire.



Figure 6: Vault Full of Dirt and Debris



Figure 7: Corrosion on Top of a Transformer

1 When equipment failures occur, emergency response and equipment replacement can
2 result in tens of thousands or even hundreds of thousands of dollars in costly repairs
3 costs. For example, a network transformer emergency replacement can cost in excess of
4 \$180,000, which is approximately 1.4 times the cost of a planned replacement, and a
5 structural rebuild of a vault can exceed \$500,000. These expenditures can be mitigated
6 through proactive maintenance activities.

7

8 In addition to safety and financial risks, below-grade equipment maintenance mitigates
9 environmental risks. For example, inspections enable the early identification of corroded
10 equipment before an oil leak develops, potentially washing into the drainage system,
11 which could result in regulatory penalties and environmental restoration costs. Figure 8
12 below depicts an oil leak within a vault. This type of deficiency is addressed by cleaning
13 activities, as shown in Figure 9.



**Figure 8: Oil Leaking from a Transformer
Base Inside a vault**



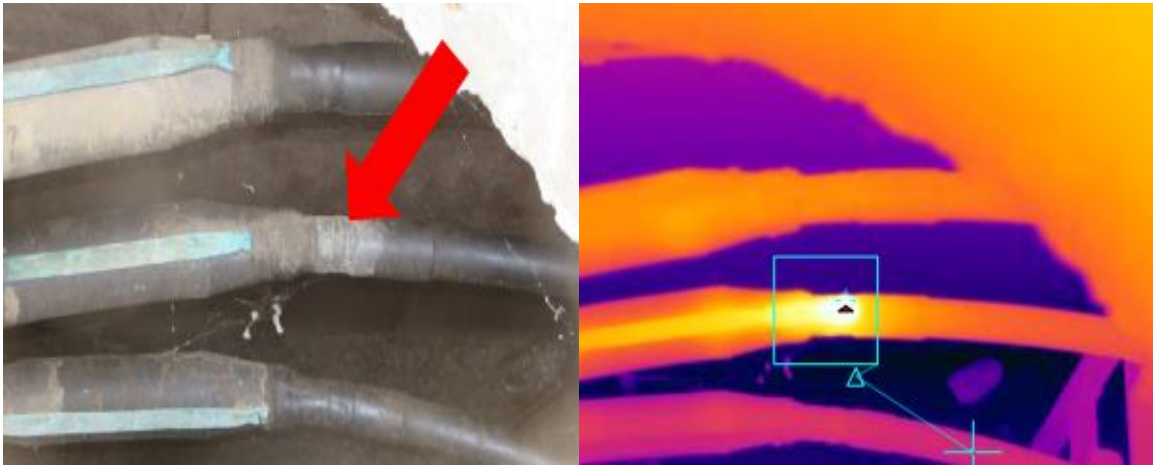
**Figure 9: Crews Cleaning a Vault that
had a Transformer Oil Leak**

1 In addition to the value provided by mitigating the aforementioned safety, financial, and
2 environmental risks, below-grade equipment maintenance provides value to customers
3 by mitigating system reliability risks associated with civil infrastructure or electrical
4 equipment failures. Between 2020 and 2022, the distribution system experienced
5 approximately 50 incidents of below-grade equipment failures annually, which resulted
6 in more than 46,000 customer interruptions and 39,000 customer hours of interruption
7 annually.

8
9 Between 2020 and 2022, Toronto Hydro experienced an average of almost 6 incidents of
10 cable chamber lid ejections annually as a result of failing cables within the cable chambers
11 igniting gases and creating a shock wave.¹⁰ Failures also occurred in CRD, URD, and
12 submersible vaults, where Toronto Hydro replaced over 300 defective or failed
13 submersible transformers over the 2020-2022 period. These failures pose system
14 reliability risks (e.g. interruptions to tens and even hundreds of customers).

15
16 The risk of equipment failure and the related system reliability risks are not only mitigated
17 through routine visual inspections, but also by thermographic scanning. Thermographic
18 or infrared scanning identifies thermal anomalies in the target equipment, and is an
19 effective predictor of equipment failure. Figure 10 below shows an example of a
20 thermographic photograph of cable splices inside a cable chamber. The deficiency, as
21 evidenced by an 80°C increase in temperature on one of the splices, is not visually evident
22 (see picture on the left), but is easily identified using the infrared image (see picture on
23 the right) so it can be corrected before failure.

¹⁰ Exhibit 2B, Section E6.3.



1 **Figure 10: Cables Inside a Cable Chamber (Left) with an Infrared Thermography Image**
 2 **of the Same Cables Denoting a Hot Spot (Right)**

3
 4 **5.2 Below-Grade Equipment Maintenance Segment Costs**

5 Table 4 provides the Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-
 6 2029) expenditures for this segment.

7
 8 **Table 4: Below-Grade Equipment Maintenance Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Below-Grade Equipment Maintenance	2.5	2.9	3.0	3.5	3.2	3.5	3.6	3.3	3.5	3.5

9
 10 **5.3 Below-Grade Equipment Maintenance Segment Year-over-Year Variance Analysis**

11 2020-2021 Variance Explanation

12 From 2020 to 2021, expenditures increased by approximately \$0.4 million, which was
 13 primarily due to an increase in the number of network protectors overhauled as well as
 14 an increase in the number of cable chambers inspected in order to reduce a backlog of
 15 overdue units.

1 2021-2022 Variance Explanation

2 From 2021 to 2022, expenditures increased by approximate \$0.1 million which was
3 primarily attributed to an increase in the number of network protector overhauls and an
4 increase in the number of submersible transformer vaults due for inspection.

5

6 2022-2025 Variance Explanation

7 Between 2022 to 2025, expenditures are forecasted to increase by approximately \$0.5
8 million, or an average of \$0.2 million per year, due to:

- 9
- an increase in the number of network protectors scheduled for overhauls; and
 - an increase in the total number of vaults due for inspection.
- 10

11

12 2025-2029 Variance Explanation

13 Between 2025 and 2029, costs in this segment are not expected to materially change as
14 inflationary pressures are offset by a reduced number of network vault inspections. Year-
15 to-year fluctuations are due to varying numbers of submersible, CRD, and URD vaults due
16 for inspection. If Toronto Hydro were forced to deliver this segment with a reduced level
17 of funding over the 2025-2029 rate period, the utility could face various risks, including:

- 18
- Compliance risks associated with statutory and regulatory requirements.¹
 - Implementation risks, such as the inability to carry out the cyclical inspections
19 necessary to maintain assets and prevent the below risks;
 - Failure risks, such as increased numbers of failures and associated outages on the
20 system due to a reduction in below-grade asset inspections and maintenance;
 - Public and employee safety risks, such as the inability to mitigate exposure to
21 blown cable chamber lid incidents due to the lack of prompt identification and
22 resolution of failing cables that can result in electrical faults leading to these
23 incidents;
 - Public and employee safety risks, such as the inability to mitigate exposure to
24 blown cable chamber lid incidents due to the lack of prompt identification and
25 resolution of failing cables that can result in electrical faults leading to these
26 incidents;

- 1 • Financial risks, such as the inability to mitigate failures and the costs associated
- 2 with emergency response and equipment replacement; and
- 3 • Environmental risks, such as the inability to prevent or mitigate the release of
- 4 underground transformer oil into the environment.

5

6 **6. PADMOUNTED EQUIPMENT MAINTENANCE SEGMENT**

7 **6.1 Segment Description**

8 Padmounted transformers and switches (collectively referred to as “padmounted
9 equipment”) are metal-clad enclosures with lockable cabinet doors located on top of
10 concrete pads within road allowances or on private properties. These assets are found
11 on the underground distribution system where cables enter underground equipment
12 through the pad. Padmounted transformers (see Figure 11) supply residential areas or
13 commercial buildings and padmounted switches (see Figure 12) enable the sectionalizing
14 of underground feeders. Toronto Hydro owns approximately 8,200 padmounted
15 transformers and 1,280 padmounted switches.



Figure 11: Padmounted Transformer



**Figure 12: Padmounted SF6-Insulated
Switch**

1 This segment also funds annual inspections for concrete tap box locations that are
2 located in high traffic pedestrian zones along Yonge Street. These tap boxes may
3 contain both primary and secondary circuits along with their associated connectors
4 and splices. They are located within the public road allowance in the sidewalks,
5 boulevards, and roadways. As a result, they are exposed to several external elements
6 such as road snow and sidewalk plows which can cause damage to these structures,
7 posing potential safety hazards to the public.

8

9 Padmounted Equipment Maintenance includes: visual inspection of pads and
10 protective bollards for damage or deterioration; visual inspection of the elevation of
11 the pad in relation to the grade; removal of overgrown vegetation that may be
12 encroaching on the pad; and a visual inspection and verification of equipment labels
13 and safety signs. Visual inspections focus on both the mechanical components (e.g.
14 doors, locks, hinges, handles, latches, and paint) and electrical components (e.g.
15 terminations, bushings, elbow connectors, transformer tank, primary and secondary
16 switches, fuses, disconnects, barriers, fault indicators, relays, oil levels). In addition,
17 maintenance includes thermographic scans and partial discharge testing of electrical
18 connections.

19

20 The following additional maintenance activities are carried out for padmounted switches:

- 21 • Batteries in SCADA switches are replaced once every three years;
- 22 • Gas levels are verified on units that are filled with SF₆ gas;
- 23 • Cable duct entries are inspected to ensure they are sealed, and ultrasonic testing
24 is conducted to identify any partial discharge; and

- 1 • Air-insulated switches that have significant dirt build-up on their insulators, show
2 evidence of tracking, or have exposed electrical terminations, are scheduled for
3 CO₂ cleaning.

4
5 CO₂ cleaning is performed as part of the Corrective Maintenance program, to remove dirt
6 and other contaminants from the switch to prevent tracking, which can lead to an arc
7 flash and equipment failure.¹¹

8
9 Toronto Hydro carries out the above noted activities on a three-year cycle for
10 padmounted transformers and annually for padmounted switches. Regular maintenance
11 cycles ensure Toronto Hydro is able to comply with applicable inspection requirements
12 and properly maintain padmounted equipment.¹²

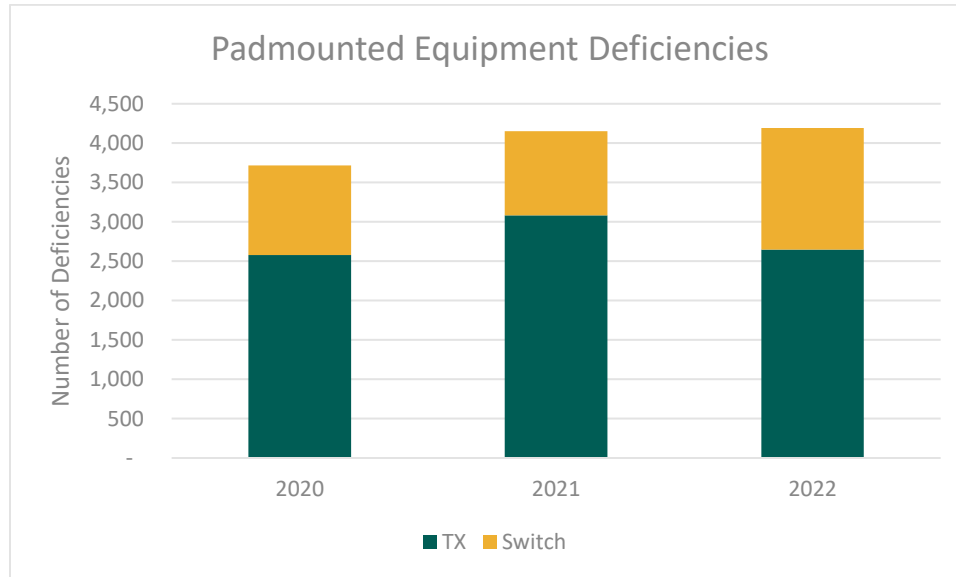
13
14 The average useful life of padmounted transformers and switches are 30 and 40 years,
15 respectively. As padmounted transformers and switches age, the likelihood of failure
16 increases as a result of current surges, ingress of moisture, dirt, and salt leading to
17 excessive corrosion, mechanical damage, and the degradation of insulating barriers for
18 equipment.

19
20 As illustrated in Figure 13 below, Toronto Hydro's inspection activities identified over
21 4,000 padmounted equipment deficiencies per year on average between 2020 and 2022.
22 Identifying those deficiencies that require corrective action and addressing them through
23 the Corrective Maintenance and Reactive and Corrective Capital programs serve to

¹¹ Exhibit 4, Tab 2, Schedule 4

¹² *Supra* note 1.

1 mitigates a wide variety of safety, environmental and system reliability risks, primarily in
2 residential areas.¹³¹⁴



3 **Figure 13: Padmounted Equipment Deficiencies Identified Between 2020 and 2022**

4

5 An example of risk mitigation is promptly identifying a corroding enclosure as illustrated
6 in Figure 14 below. If not identified and addressed, corrosion (which may also be present
7 on internal components) can give rise to significant environmental, safety, and reliability
8 risks. Through maintenance activities, Toronto Hydro also rectifies switches with rusted
9 coil springs (as shown in Figure 15 below), which may break during activation and prevent
10 the switch from opening and closing. If undetected, this condition can result in an arc
11 flash and endanger employees operating the switch.

¹³ Exhibit 4, Tab 2, Schedule 4

¹⁴ Exhibit 2B, Section E6.7.



Figure 14: Padmounted Transformer with Surface Corrosion



Figure 15: Padmounted Switch with Rusted Coil Spring

1

2 Another example of risk mitigation is identifying and addressing excessive vegetation
3 growth near equipment. If unaddressed, overgrown vegetation not only hinders access
4 to the transformer during an emergency, but can also pose a safety and fire risk.
5 Electricity can arc or flashover to nearby vegetation, even without physical contact.
6 Figure 16 below illustrates an example of excessive vegetation growth.



7

Figure 16: Padmounted Transformer Requiring Vegetation Removal

1 Transformers also require maintenance where locks, hinges, or warning signage have
 2 been vandalized, broken, or removed. If unaddressed, these conditions can lead to
 3 serious safety-related incidents if someone inadvertently comes into contact with
 4 padmounted equipment.

5

6 Padmounted unit failures also impact Toronto Hydro’s system reliability, potentially
 7 affecting anywhere from several residential and commercial customers (when a
 8 transformer fails), to hundreds of customers in the case of a switch failure. When a switch
 9 unit fails, multiple feeders can experience a power interruption, as switches often act as
 10 a tie point for multiple feeders. Maintenance activities are designed to mitigate the risk
 11 of such failures and ensure SCADA switches do not contain failed batteries that render
 12 switches inoperable remotely. Between 2020 and 2022, the distribution system
 13 experienced over 1,600 customer interruptions and 700 customer hours of interruption
 14 annually due to failures of padmounted equipment.

15

16 **6.2 Padmounted Equipment Maintenance Segment Costs**

17 Table 5 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 18 (2025-2029) expenditures for this segment.

19

20 **Table 5: Padmounted Equipment Maintenance Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Padmounted Equipment Maintenance	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6

1 **6.3 Padmounted Equipment Maintenance Segment Year-over-Year Variance Analysis**

2 2020-2021 Variance Explanation

3 From 2020 to 2021, expenditures decreased by approximately \$0.1 million which was
4 primarily attributed to a decrease in the number of padmounted equipment inspected.

5
6 2021-2022 Variance Explanation

7 From 2021 to 2022, expenditures did not materially change.

8
9 2022-2025 Variance Explanation

10 Between 2022 and 2025, costs in this segment are expected to increase by approximately
11 \$0.1 million due to inflationary pressures.

12
13 2025-2029 Variance Explanation

14 Between 2025 and 2029, expenditures are not expected to materially change. If Toronto
15 Hydro were forced to deliver this segment with a reduced level of funding over the 2025-
16 2029 rate period, the utility could face various risks, including:

- 17 • Compliance risks associated with statutory and regulatory requirements.¹
- 18 • Implementation risks, such as the inability to carry out the cyclical inspections
19 necessary to maintain padmounted equipment and prevent the below risks;
- 20 • Failure risks, such as increased numbers of failures and associated outages on the
21 system due to a reduction in padmounted asset inspections and maintenance;
- 22 • Public and employee safety risks, such as the inability to mitigate safety hazards
23 associated with padmounted equipment;
- 24 • Financial risks, such as the inability to mitigate costly failures; and
- 25 • Environmental risks, such as the inability to prevent or mitigate the release of SF₆
26 from leaking padmounted switches into the environment.

1 **7. CABLE DIAGNOSTIC TESTING SEGMENT**

2 **7.1 Segment Description**

3 Since 2015, Toronto Hydro has been performing diagnostic testing on select newly
4 installed underground primary cables and cables at high risk locations (locations that
5 exhibited underground faults based on reliability data). As of 2020, the utility has
6 expanded this type of work into a dedicated maintenance program for performing
7 diagnostic testing on cables installed in Toronto Hydro’s underground system to provide
8 a more accurate assessment of the condition of underground cables, splices, joints and
9 terminations. Diagnostic testing is expected to support the delivery of more reliable
10 service to customers, and allow more effective capital allocation by providing a stronger
11 basis for informed underground project planning and prioritization.

12

13 Toronto Hydro intends to test all newly installed cables being commissioned as part of its
14 regular practice. In addition, the utility plans to test high-risk feeders in the Downtown
15 Core on a four-year cycle in alignment with downtown station maintenance cycles so as
16 to minimize additional costs for outages and site visits. In addition, select subdivisions in
17 the Horseshoe area will be chosen for testing to assist with making capital investment
18 decisions with more condition-based data and to address areas with poor reliability.

19 The two most common types of cables installed in Toronto Hydro’s underground system
20 are Paper Insulated Lead-Covered (“PILC”) and Cross-Linked Polyethylene (“XLPE”), as
21 shown in Figure 17.

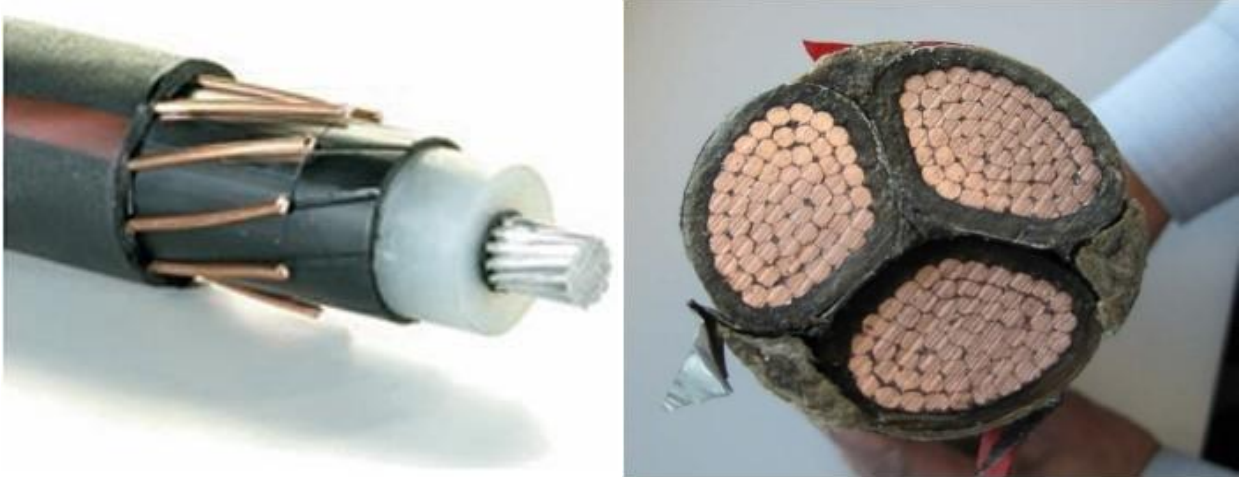


Figure 17: Example of XLPE Cable (Left) and PILC Cable (Right)

1

2

3 Toronto Hydro has approximately 1,030 circuit kilometres of PILC cables, and over 4,500
4 circuit kilometres of XLPE cable.

5

6 In the past, asset data such as age, historical failures, and number of joints etc. were used
7 to determine appropriate replacement strategies for these cables. Utilizing cable
8 diagnostic testing provides a more accurate assessment of the condition of underground
9 cables, splices, joints, and terminations. It enables predictive analysis and allows Toronto
10 Hydro planners and engineers to effectively determine the cables that currently are, or
11 will soon be, at risk of failure.

12

13 Cable diagnostic testing is an accepted practice industry-wide and used in numerous
14 other electrical utilities in Canada and the United States. Toronto Hydro follows industry
15 standards that support and provide guidelines for cable testing in the field, including IEEE
16 400-2012, IEC 60060, IEC 60085, and IEC 60502.

1 The expected life of underground cable varies by type and construction. The expected
2 life of XLPE cable is 40 years for jacketed direct-buried (“DB”) cable, 20 years for un-
3 jacketed DB cable, and 50 years for cable in concrete duct installations. The expected life
4 of PILC cable is 65 years. A majority of the PILC and XLPE cable populations (which were
5 installed in the beginning in the early 1900s and 1950s, respectively) have reached their
6 expected useful lives.

7

8 As cables age, the likelihood of failure increases as a result of water treeing, electrical
9 treeing, and insulation breakdown for cables.¹⁵

10 In addition, cables will experience aging differently depending on the following factors:

- 11 • Manufacturing quality;
- 12 • Damage during installation and workmanship issues;
- 13 • Installation environment (e.g. areas with high moisture levels result in water
14 penetration of the insulation (or water treeing) and thereby causing insulation
15 failure);
- 16 • Operating temperature and loading (e.g. higher loading and resulting
17 temperatures accelerate the aging process); and
- 18 • Ambient temperature of the installation environment (e.g. higher temperatures
19 accelerate the aging process).

20

21 Defective primary cables and cable accessories accounted for approximately 73 percent
22 of all customer interruptions and 75 percent of all customer hours of interruption for
23 underground equipment between 2020 and 2022. On average, over the same period,
24 approximately 130 interruptions a year were related to defective underground primary

¹⁵ Water ingress into the cable insulation in the presence of an electrical field causes microscopic tears called “water treeing.” Over time, continued moisture penetration and the presence of electrical stresses causes these water trees to become electrical trees (whereby the tears become carbonized and can conduct electricity).

1 cables, which resulted in over 131,000 customers interrupted and 116,000 customer
2 hours of interruption annually.

3

4 Based on Toronto Hydro's experience, when a cable fails once, repeated failures are very
5 likely. Cables prone to failure not only impact system reliability, but also entail safety and
6 environmental risks. Figure 18 depicts a leaking cable splice.

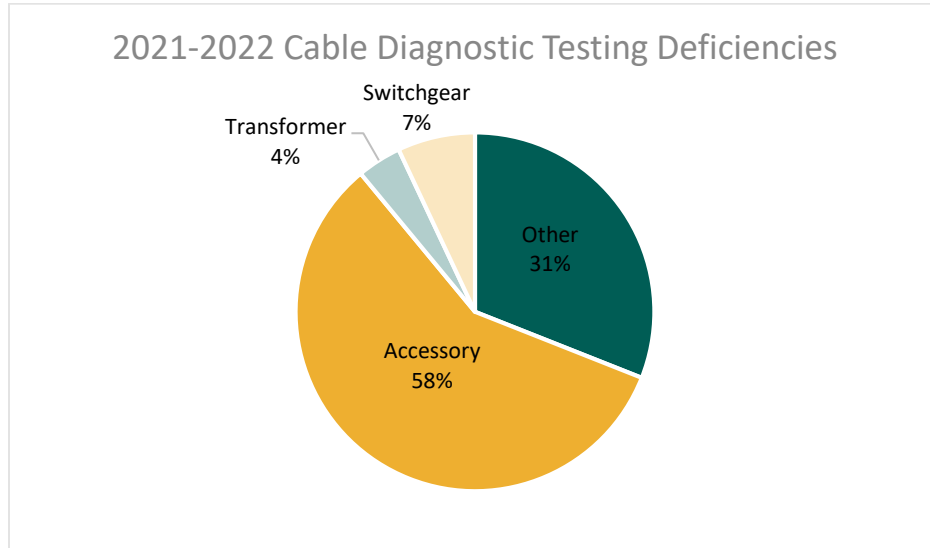


7

Figure 18: Oil Leakage from Cable Lead Splice

8

9 Cable Diagnostic Testing performed from 2021-2022 identified deficiencies as shown in
10 Figure 19 below.



1 **Figure 19 Cable Diagnostic Testing Deficiencies Identified Between 2021 and 2022**

2

3 This program has helped identify deficiencies, such as accessory-related issues related to
4 poor workmanship, incorrectly installed faulted circuit indicators, and hot spots or partial
5 discharge on elbows, terminations and splices, enabling appropriate corrective work to
6 be issued to mitigate failure risk.

7

8 As this program continues to mature, the diagnostic data available on cables will continue
9 to grow and will allow Toronto Hydro to better understand how cables degrade over time,
10 evaluate the variation between cable types, and provide feedback to system planning,
11 standards, and quality groups to make improvements for future cable installations. The
12 data collected from the tests will be used to help predict cables at risk of degradation and
13 help in identifying problematic locations in the system with a higher degree of accuracy.

14

15 **7.2 Cable Diagnostic Testing Segment Costs**

16 Table 6 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
17 (2025-2029) expenditures for this segment.

1 **Table 6: Cable Diagnostic Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Cable Diagnostic Testing	-	0.3	0.4	0.6	0.6	0.7	0.8	0.8	0.8	0.8

2

3 **7.3 Cable Diagnostic Testing Segment Year-over-Year Variance Analysis**

4 2020-2021 Variance Explanation

5 From 2020 to 2021, expenditures increased by approximately \$0.3 million which was
 6 primarily due to an increase in the number of Horseshoe area feeders tested.

7

8 2021-2022 Variance Explanation

9 From 2021 to 2022, expenditures increased by approximately \$0.1 million which was
 10 primarily due to an increase in the number of downtown feeders tested.

11

12 2022-2025 Variance Explanation

13 Between 2022 and 2025, expenditures are forecasted to increase by approximately \$0.3
 14 million, or an average of \$0.1 million per year, due to the increasing number of feeders
 15 tested as this segment continues to ramp up.

16

17 2025-2029 Variance Explanation

18 Between 2025 and 2029, expenditures are expected to increase by approximately \$0.1
 19 million, due to inflationary pressures. The Cable Diagnostic Testing Segment is relatively
 20 new and as a result, is continuing to evolve with each additional year of testing. The
 21 expenditures and volume of work proposed over the 2025-2029 rate period are based on
 22 Toronto Hydro's estimate of feeder segment unit costs using 2020-2022 actuals.
 23 However, the volume of work executed can vary significantly as a result of the complexity
 24 of each feeder segment based on length, accessibility, and number of terminations along

1 the feeder segment. If Toronto Hydro were forced to deliver this segment with a reduced
2 level of funding over the 2025-2029 rate period, the utility could face various risks,
3 including:

- 4 • Risk of missed opportunity to identify and correct deficiencies to mitigate failure
5 risk for biggest source of defective equipment related outages on underground
6 system (i.e. cable and cable accessories); and
- 7 • Risk of not leveraging source of data and insights into cable degradation and
8 failures to improve project planning and prioritization and future cable
9 installations.

11 **8. CONTACT VOLTAGE SCANNING SEGMENT**

12 **8.1 Segment Description**

13 Most of Toronto Hydro's electrical distribution equipment is exposed to environmental
14 elements, including wide seasonal temperature variations and accumulation of dirt or
15 debris. This may result in the partial or total failures of electrical distribution equipment,
16 and can lead to live wires making contact with nearby structures (poles, bus shelters,
17 concrete housing etc.).

18
19 These issues can give create a public safety hazard known as contact voltage, which has
20 the potential to cause electric shock. A typical example of a contact voltage hazard is an
21 exposed secondary voltage wire in a sidewalk handwell or inside a street lighting pole that
22 energizes the sidewalk or pole. Contact voltage endangers the public, workers, and pets
23 that may come into contact with the energized surface.

24
25 The main activity in this segment is the use of a mobile scanning tool (i.e. a voltage
26 detection system) mounted onto a vehicle to scan for contact voltage throughout Toronto

1 Hydro's service area. Data is collected and analyzed to determine the location and nature
2 of the fault. Based on the results, a repair crew is dispatched to further investigate and
3 eliminate the fault.¹⁶

4

5 Previously Toronto Hydro scanned the entire distribution system on a one-year cycle.
6 However, to save costs without compromising safety, the utility now takes a risk-based
7 approach. Of the total 25 wards that make up Toronto, the utility continues to scan 11 of
8 them annually. These 11 wards include all high-risk wards that exhibit a higher amount
9 of contact voltage incidents and wards in the downtown region which have a higher
10 density of objects that may have contact voltage such as traffic lights, bus shelters, street
11 light poles, and handwells. The remaining 14 wards, which are all in the Horseshoe area
12 and have a lower average number of contact voltage incidents, are scanned once every
13 three years.

14

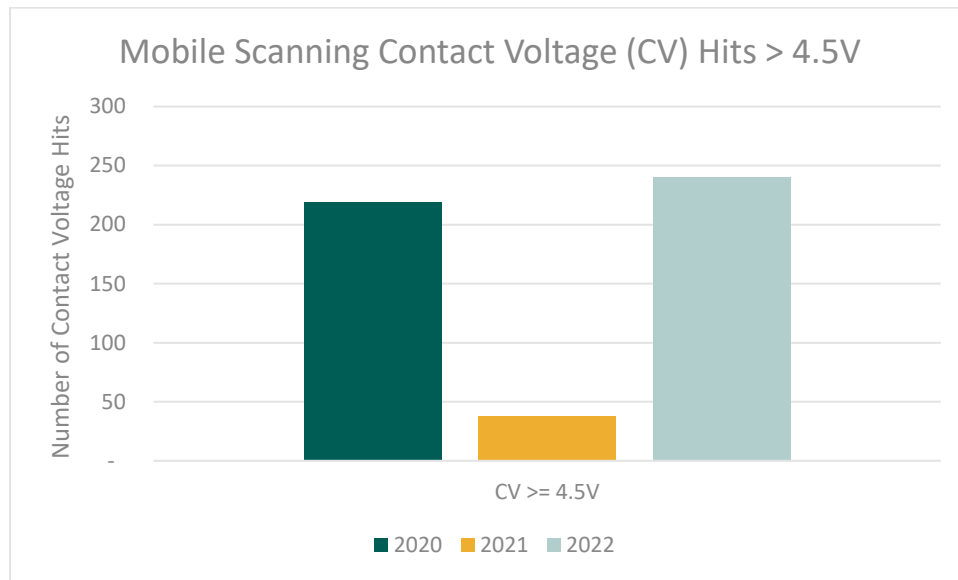
15 The mobile scanning tool locates assets with contact voltages greater than 1 volt. Toronto
16 Hydro uses the Third Harmonic ("3HD") as a guideline (as recommended by the IEEE
17 Working Group on "Voltages at Publicly and Privately Accessible Locations") to prioritize
18 corrective action for contact voltages found. If a contact voltage equal to or greater than
19 10 volts is found, the scanning crew will identify and barricade the relevant area and
20 remain on site until a follow-up emergency response crew arrives to make permanent
21 repairs. With respect to a contact voltage between 4.5 volts and 10 volts, the incident is
22 analyzed and corrective action is issued. Notices are issued to affected parties if the
23 contact voltage is found on customer or third party owned equipment. Contact voltage
24 incidents less than 4.5 volts are reported to Toronto Hydro for review, and notices are

¹⁶ The contract for the Contact Voltage Scanning program ended in March, 2021 and a new contract was not completed in time in order to continue the program for the rest of the year which led to a much lower number of contact voltage hits being reported in 2021.

1 issued to affected parties (where the contact voltage was found on customer or third
2 party owned equipment).

3

4 Figure 20 below shows the volume of contact voltage incidents (>4.5 volts) identified
5 between 2020 and 2022.



6 **Figure 20: Contact Voltage Hits (>4.5 V) (2020-2022)**

7

8 Traffic lights, bus shelters, street light poles, and handwells have been the primary
9 sources of contact voltages throughout the City of Toronto in recent years as shown in
10 Figure 21.

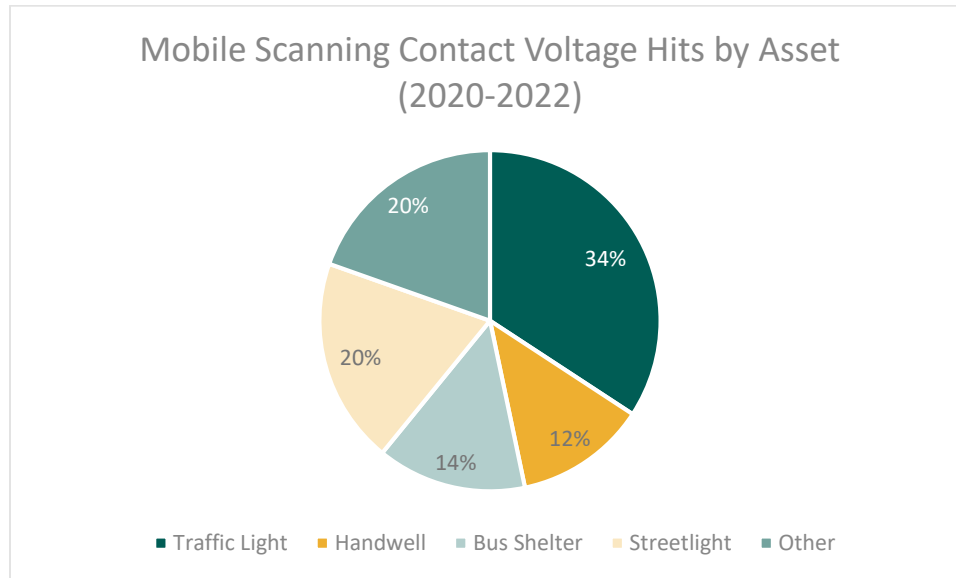


Figure 21: Contact Voltage Hits by Asset (2020-2022)

1

2

3 Scanning is performed during the months of January to March and September to
4 December as Toronto Hydro’s previous experience of scanning throughout the entire year
5 indicated that most cases of contact voltage occur during the winter months. Underlying
6 causes include aging infrastructure, freezing/thawing conditions, and vibrations at or
7 below grade (which can cause wires to dislodge).

8

9 Contact voltage remains a risk for pedestrians and pets in the City of Toronto. By scanning
10 for contact voltages across the city and addressing defective equipment through the
11 Corrective Maintenance or Reactive and Corrective Capital program, the number of
12 contact voltage related safety incidents can be reduced.

13

14 **8.2 Contact Voltage Segment Costs**

15 Table 7 provides the Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-
16 2029) expenditures for this segment.

1 **Table 7: Contact Voltage Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Contact Voltage Scanning	2.0	0.7	1.8	1.7	1.8	2.0	2.0	2.0	2.2	2.1

2

3 **8.3 Contact Voltage Segment Year-over-Year Variance Analysis**

4 2020-2021 Variance Explanation

5 From 2020 to 2021, expenditures decreased by approximately \$1.3 million, due to the
 6 lower number of wards scanned. In 2021, the contract for this work ended in March and
 7 was not re-signed in time for scanning to be done over September to December.

8

9 2021-2022 Variance Explanation

10 From 2021 to 2022, expenditures increased by approximately \$1.1 million to fund the
 11 scanning of all high-risk wards on an annual cycle, with the remaining wards scanned on
 12 a three-year cycle.

13

14 2022-2025 Variance Explanation

15 Between 2022 and 2025, expenditures are expected to increase by approximately \$0.2
 16 million, or an average of \$0.1 million per year, due to inflationary pressures.

17

18 2025-2029 Variance Explanation

19 Between 2025 and 2029, expenditures are forecasted to increase by approximately \$0.1
 20 million due to inflationary pressures. Year-to-year fluctuations are due to varying
 21 numbers of wards due for scanning. If Toronto Hydro were forced to deliver this segment
 22 with a reduced level of funding over the 2025-2029 rate period, the utility could face
 23 various risks, including:

- 1 • Public safety risks, such as the inability to prevent safety hazards such as electrical
- 2 shocks caused by contact voltage which endanger the public, workers, and animals
- 3 that may come into contact with energized surfaces.

1 **PREVENTATIVE AND PREDICTIVE STATION MAINTENANCE**

2

3 **1. OVERVIEW**

4 **Table 1: Preventative and Predictive Station Maintenance Program Summary**

Preventative and Predictive Station Maintenance Program									
Outcomes: Operational Effectiveness - Reliability, Environment, and Operational Effectiveness – Safety									
Segments:									
<ul style="list-style-type: none"> • Customer Location Maintenance • Station Inspections and Auxiliary Equipment Maintenance • Station Switchgear Maintenance • Station Equipment Maintenance 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
5.9	6.4	5.5	6.5	7.0	8.0	7.6	7.7	8.6	8.8

5

6 The Preventative and Predictive Station Maintenance program (the “Program”) addresses
 7 maintenance activities on Toronto Hydro’s: (i) station assets; and (ii) assets located at
 8 customer-owned buildings or dedicated areas on customer premises. This Program
 9 involves inspection and maintenance tasks of equipment to identify and address
 10 predetermined conditions indicative of a potential failure. The activities comprising the
 11 individual segments in this Program are focused on preserving and maximizing the
 12 performance of assets over their expected useful life while mitigating a wide variety of
 13 system risks.

14

15 This Program is also designed to minimize overall costs and account for other factors such
 16 as the safety of Toronto Hydro’s work crews and the public, and ensures compliance with

1 statutory and regulatory requirements.¹ The Station Maintenance Program is comprised
2 of the following four segments:

- 3 • **Customer Location Maintenance:** A subset of Toronto Hydro’s customers is
4 supplied by electrical equipment, such as transformers and switches, located
5 within customer-owned buildings (vaults) or dedicated areas on customer
6 premises. The activities in this segment are aimed at inspecting and maintaining
7 this equipment. In addition, the inspection and maintenance of primary Automatic
8 Transfer Switches (“ATS”), communication systems for vaults located deep
9 underground, and Distributed Energy Resource (“DER”) sites, are conducted under
10 this segment.
- 11 • **Station Inspections and Auxiliary Equipment Maintenance:** This segment focuses
12 on two sets of work: (i) the periodic inspection of all Transformer Stations (“TS”)
13 and Municipal Stations (“MS”) and associated equipment, as well as battery
14 Energy Storage Systems (“ESS”); and (ii) maintenance of auxiliary equipment
15 housed or used at stations, including station batteries, air compressors, and
16 testing equipment.²
- 17 • **Station Switchgear Maintenance:** This segment includes the testing and
18 maintenance of Toronto Hydro owned switchgear units and circuit breakers
19 located at TSs and MSs across the utility’s service territory.
- 20 • **Station Equipment Maintenance:** This segment includes the maintenance of
21 equipment located at 23 TS and 139 MS locations, including 183 station
22 transformers. Maintenance activities include the inspection, testing, cleaning, and
23 calibrating of assets such as power transformers and their auxiliary equipment.

¹ Ontario Energy Board, *Distribution System Code*, Appendix C (August 2, 2023).

² Transformer stations are points of power supply from the Hydro One Networks Inc. (“Hydro One”) transmission system which step down supply voltages.

1 By preserving and maximizing the performance of station assets and assets located in
 2 customer-owned buildings, this Program contributes to maintaining safety and the
 3 environment, and overall system reliability at reasonable costs to Toronto Hydro’s
 4 customers.

5

6 **2. OUTCOMES AND MEASURES**

7 **Table 2: Preventative and Predictive Station Maintenance Program Outcomes and**
 8 **Measures Summary**

Operational Effectiveness – Reliability	<ul style="list-style-type: none"> Contributes to maintaining existing levels of system reliability (SAIDI/SAIFI) by inspecting station assets for deficiencies in compliance with the Ontario Energy Board’s (“OEB”) Distribution Systems Code (“DSC”).
Environment	<ul style="list-style-type: none"> Operate in an environmentally responsible manner and Reduces the environmental impact of Toronto Hydro’s distribution system by proactively identifying station equipment for replacement, such as transformers exhibiting signs of oil deficiencies or circuit breakers leaking SF₆ gas, for replacement and minimizing the likelihood of these associated contaminants from entering the environment.
Operational Effectiveness – Safety	<ul style="list-style-type: none"> Contributes to Toronto Hydro’s public safety performance (as measured by the OEB’s distributor scorecard safety metrics), employee safety performance, and compliance with applicable safety requirements (including Ontario Regulation 22/04, the Ontario Fire Code, and the <i>Occupational Health and Safety Act</i>) by proactively performing inspections to reduce the risk of asset failures that may otherwise endanger the general public and Toronto Hydro crews (e.g. failure of a vault transformer, station power transformer or switchgear which can result in a fire).³

9

10 **3. PROGRAM DESCRIPTION**

11 The Preventative and Predictive Station Maintenance program funds maintenance
 12 activities in respect of: (i) Toronto Hydro’s station assets; and (ii) Toronto Hydro’s assets

³ Ontario Regulation 213/07: Fire Code made under the *Fire Protection and Prevention Act, 1997*, SO 1997, Chapter 4.

1 located at customer-owned buildings or dedicated areas on customer premises. This
2 Program involves inspection and maintenance tasks typically conducted on a fixed cycle
3 and inspection of equipment for indications of potential failure. The activities comprising
4 the individual segments in this Program are focused on preserving and maximizing the
5 performance of assets over their expected useful life while mitigating a wide variety of
6 system risks. This Program is also designed to minimize overall costs and account for
7 other factors such as the safety of Toronto Hydro work crews and the public, and ensure
8 compliance with statutory and regulatory requirements.

9

10 Maintenance activities in this Program include inspections to assess the condition of
11 customer location building vault structures and the equipment housed inside (including
12 transformers, switches, and cables), as well as inspections of station facilities and station
13 assets (including power transformers, switchgear, and auxiliary station equipment). The
14 Station Maintenance Program is comprised of the following four segments:

- 15 • **Customer Location Maintenance:** A subset of Toronto Hydro’s customers is
16 supplied by electrical equipment such as transformers and switches that are
17 located within customer-owned buildings (vaults) or dedicated areas on customer
18 premises. The activities in this segment are aimed at inspecting and maintaining
19 this equipment. In addition, the inspection and maintenance of primary Automatic
20 Transfer Switches (“ATS”), communication systems for vaults located deep
21 underground, and Distributed Energy Resource (“DER”) sites, are conducted under
22 this segment.
- 23 • **Station Inspections and Auxiliary Equipment Maintenance:** This segment funds
24 two types of work: (i) periodic inspection of all TSs and MSs and the associated
25 equipment, as well as battery Energy Storage Systems (“ESS”); and (ii)

1 maintenance of auxiliary equipment housed or used at stations including station
2 batteries, air compressors, and testing equipment.

- 3 • **Station Switchgear Maintenance:** This segment includes the testing and
4 maintenance of Toronto Hydro owned switchgear units and circuit breakers
5 located at TSs and MSs across the utility’s service territory.
- 6 • **Station Equipment Maintenance** – This segment includes the maintenance of
7 equipment located at 23 TS and 139 MS locations, including 183 station
8 transformers.

9

10 Detailed descriptions of the segments are provided in sections 5-8 below.

11

12 **4. PROGRAM COSTS**

13 In 2025, Toronto Hydro requires \$8.0 million in rate funding for the Preventative and
14 Predictive Station Maintenance program, which represents an increase of \$2.1 million
15 over the previous rate period in 2020.

16

17 Over the 2025-2029 rate period, the utility expects the cost of this program to increase
18 by a compounded annual growth rate of 2.7 percent, which is necessary to address station
19 maintenance needs and deliver the customer outcomes enabled by this program.

20

21 The Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-2029) expenditures
22 for each segment are summarized in Table 3 below.

1 **Table 3: Stations Maintenance Program Expenditures by Segment (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Customer Location Maintenance	1.3	1.1	1.3	1.6	1.6	1.5	1.7	1.6	2.0	1.5
Station Inspections and Auxiliary Equipment Maintenance	1.1	1.1	1.2	1.1	1.1	1.3	1.2	1.2	1.3	1.6
Stations Switchgear Maintenance	2.7	3.2	2.4	2.8	3.4	4.1	3.6	3.6	4.2	4.5
Station Equipment Maintenance	0.8	1.0	0.6	1.0	0.9	1.1	1.1	1.3	1.1	1.2
Total	5.9	6.4	5.5	6.5	7.0	8.0	7.6	7.7	8.6	8.8

2

3 **4.1 Cost Drivers**

4 Year-over-year cost variances in this Program tend to be primarily driven by differences
 5 in the volume and complexity of units inspected and maintained. For example, air blast
 6 circuit breakers and switchgear with a higher number of circuits are generally more
 7 expensive to maintain on a per unit basis. Other recent cost drivers in this Program
 8 include the addition of new activities such as ESS site maintenance and Deep Vault
 9 Communication testing.

10

11 **4.2 Cost Control and Productivity Measures**

12 *4.2.1 Cost Management*

13 The sales, decommissioning, and conversions of stations and their equipment such as 4kV
 14 MS stations will in turn yield direct cost savings from the elimination of the inspection and
 15 maintenance of assets at these locations. Additional savings will be realised from the
 16 reduction in maintenance activities for station air compressors serving the TTC whose
 17 ownership is transferred to the TTC, and the elimination of legacy air blast circuit
 18 breakers.

19

20 Not all stations are equal and will vary in size and number of assets. This has resulted in a
 21 varying amount of labour and costs required in order to maintain all equipment in a given

1 year. Work is being undertaken to reduce this variability in order to balance the amount
2 of resources and costs required to maintain all station assets year over year.
3 In addition, in order to keep labour costs down, Toronto Hydro conducts analysis to
4 determine the lowest cost resource (e.g. internal vs. external contractor) and allocates
5 maintenance to the most cost effective resource.

6

7 *4.2.2 Productivity*

8 Toronto Hydro has placed significant emphasis on achieving greater output for the same
9 or reduced input in each of the segments within the Preventative and Predictive Station
10 Maintenance program. Toronto Hydro continues to rely on the Reliability Centered
11 Maintenance (“RCM”) approach and adjusts its maintenance tasks and frequencies based
12 on RCM, Condition-Based Maintenance, and continuous improvement principles.
13 Examples of these adjustments include:

- 14 • Continuously updating inspection forms to allow for the capturing of greater
15 details about substandard conditions or deficiencies found during inspections.
16 These updates enable better prioritization and determination of the most
17 appropriate corrective action for each deficiency to better mitigate public and
18 employee safety, as well as environmental, system reliability, and financial risks.
- 19 • Standardizing the scheduling of outage-based activities to align with station
20 maintenance cycles wherever possible to minimize the need for multiple
21 equipment outages (and significant switching resources), enable bundling of
22 maintenance work, and minimize the need for multiple trips to particular sites.
- 23 • Implementing “find and fix” protocols whereby crews that identify minor asset
24 deficiencies address the deficiencies by replacing them onsite instead of only
25 logging the deficiencies for the Corrective Maintenance program.⁴

⁴ Exhibit 4, Tab 2, Schedule 4.

- 1 • Issuing longer-term inspection maintenance contracts to third-party service
2 providers to help keep unit costs stable and increases service quality levels over
3 time as retaining the same service provider increases their experience and
4 familiarity with identifying deficiencies on Toronto Hydro’s distribution system.
- 5 • Introducing new tools or making greater use of technology such as Infrared
6 Thermography, Electronic Maintenance Sheets, Furan Sampling, Doble Testing,
7 Dissolved Gas Testing, Online Partial Discharge Testing, and Enhanced Battery
8 Testing.

9
10 The following sections discuss the drivers of each of the segments that make up the
11 Preventative and Predictive Station Maintenance program.

12 13 **5. CUSTOMER LOCATION MAINTENANCE SEGMENT**

14 **5.1 Segment Description**

15 A subset of Toronto Hydro’s customers is supplied by electrical equipment, such as
16 transformers and switches, that is located within customer-owned buildings (vaults) or
17 dedicated areas on customer premises. These sites are found in or adjacent to industrial
18 or commercial buildings, hospitals, schools, apartments, and condominiums, and are
19 secured to prevent unauthorized access to energized equipment.

20
21 The equipment contained in these sites, including over 12,000 transformers, is owned by
22 Toronto Hydro and requires regular inspection and maintenance. There are
23 approximately 4,413 customer-owned locations where Toronto Hydro is obligated to
24 maintain or inspect equipment. For maintenance purposes, these 4,413 locations are
25 divided into two subsets based on customer load requirements: (i) 4,042 Customer

1 Building Vaults which possess transformation capacity less than 2,000 kVA; and (ii) 371
2 Customer Substations, which have transformation capacity of 2,000 kVA or above.

3

4 Toronto Hydro maintains Customer Building Vaults on a three-year cycle, in compliance
5 with the OEB's Minimum Inspection Requirements (Appendix C of the DSC). Maintenance
6 of Customer Building Vaults includes a visual inspection of the vault and equipment,
7 thermographic scans and partial discharge testing of all electrical equipment and
8 connections to detect thermal anomalies and corona, and general cleaning to reduce
9 contamination build-up and electrical tracking. Deficiencies that are noted during
10 inspections are either addressed immediately or subsequently addressed through
11 corrective maintenance. The condition of the customer's civil structure is also assessed
12 and any identified deficiencies are communicated to the customer for remediation.

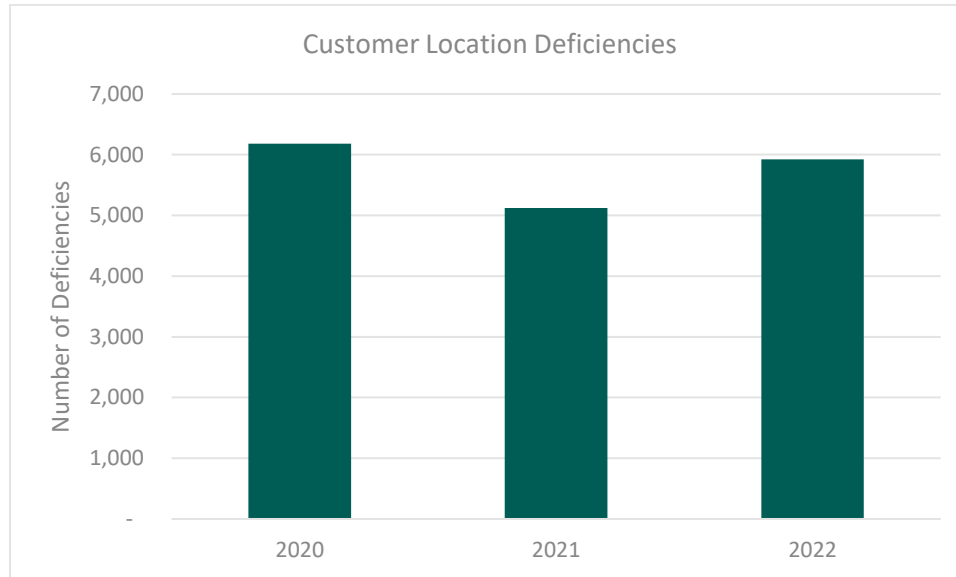
13

14 Customer Substations are inspected annually and maintained every four years.
15 Inspections ensure that ventilation, access, and drainage systems are operating as
16 required and that equipment is not leaking, defective, or corroded. Maintenance includes
17 visual inspections, thermographic scans, functional tests, oil testing, and general cleaning.

18

19 Through Customer Location Maintenance, Toronto Hydro identifies deficiencies in
20 electrical equipment and verifies the integrity and security of the structures that house
21 the equipment at Customer Building Vaults and Customer Substations. Identifying and
22 addressing deficiencies minimize the likelihood of equipment failure, mitigating risks
23 relating to public and employee safety, the environmental, financial impacts, and system
24 reliability. As illustrated in Figure 1 below, since 2020, Toronto Hydro has identified on
25 average over 5,700 deficiencies at Customer Locations each year. Those deficiencies

1 requiring corrective action that cannot be addressed immediately are addressed as part
2 of the Corrective Maintenance and Reactive Capital programs.



3 **Figure 1: Customer Location Deficiencies Identified Between 2020 and 2022**

4
5 Specific examples of deficiencies identified and their associated risks include:

- 6 • Dirty vaults that require cleaning to reduce the risks of flashover caused by
7 contamination build-up and premature equipment failure, which can result in
8 injury to employees, customers, and members of the public that are near these
9 vaults, as well as property damage;
- 10 • Corrosion of equipment, locks and doors (as illustrated in Figure 2 below), which
11 can result in unauthorized entry and pose a safety risk if individuals make contact
12 with energized equipment;
- 13 • Oil leaking from cables or transformers (as illustrated in Figure 3 below), which if
14 not addressed in a timely manner, can result in oil entering the drainage system
15 and potentially spilling into environmentally sensitive areas;

- 1 • “Hot spots” on equipment identified using a thermographic cameras before
2 excessively high temperatures cause burnt insulation and electrical faults, which
3 pose serious safety risks (e.g. vault fire); and
- 4 • Degradation of a transformer’s insulating oil properties due to the concentrations
5 of certain gases (e.g. hydrogen, carbon monoxide, methane, and acetylene),
6 which can be identified via transformer oil testing as indications of an elevated
7 risk of transformer failure.

8

9 Beyond inspections of the electrical equipment, Customer Location Maintenance
10 activities include inspections of the civil infrastructure housing the equipment. Such civil
11 infrastructure is owned by Toronto Hydro’s customers, who are responsible for repairs.
12 Nevertheless, it is prudent for Toronto Hydro to continue inspections and issue follow-up
13 Customer Action Forms given the risk that customers may fail to carry out necessary
14 repairs in a timely manner. It is not uncommon for structural elements to be in poor
15 condition to the point that walls (as illustrated in Figure 4 below) and roofs are at risk of
16 collapsing on Toronto Hydro’s equipment.

17

18 In addition, improperly maintained landscaping and vegetation at or near outdoor
19 customer locations can pose safety risks (e.g. vegetation becoming energized and possibly
20 catching fire) and prevent Toronto Hydro crews from entering the sites to carry out
21 required work (as illustrated in Figure 5 below). Such serious deficiencies are
22 communicated to customers so that they can be addressed.



Figure 2: Rusty Door



Figure 3: Transformer Leaking Oil



Figure 4: Cracked Walls



Figure 5: Vegetation Overgrowth

1
2
3
4
5
6

By preventing equipment failures and non-electrical deficiencies, Customer Location Maintenance activities also prevent power interruptions. A failure at a Customer Building Vault will typically impact one or more customers for a prolonged period of time depending on the type of failure. Failures at Customer Substations have a greater impact as more than 2,000 kVA of load may be interrupted for similar durations.

1 Beginning in 2020, Toronto Hydro began inspecting vaults containing primary ATS every
2 three years. These switches are designed to automatically switch over to a standby feeder
3 when the normal feeder has power interrupted and require functional testing to ensure
4 they are operable. This program was created in response to a failure from an ATS for the
5 Rouge Valley hospital back in 2018, which resulted in a prolonged outage.

6

7 Beginning in 2022, Toronto Hydro also initiated a Deep Vault Communication program to
8 test radio antennas installed at vaults located in underground garages at P2 level or lower
9 with poor radio signals. These antennas are installed in order to amplify radio signals and
10 this equipment needs to be tested periodically to ensure the safety of crews working at
11 these vaults.

12

13 Beginning in 2023, Toronto Hydro is piloting inspections of renewable and non-renewable
14 Distributed Energy Resource (“DER”) sites, which are electrical generation and storage
15 sites connected to Toronto Hydro’s distribution system. DER sites could potentially
16 introduce safety or reliability issues to the grid. In order to mitigate this, the monitoring
17 and control equipment installed at these sites require inspection and maintenance in
18 order to ensure the safe and reliable disconnection and monitoring of DER sites.

19

20 The Electrical Safety Authority (“ESA”) has identified that 3-Phase 3 Wire solidly grounded
21 customer services to be a potential safety hazard. If the customer has a supply from a
22 grounded wye connected transformer, a short circuit on the customer side could pose a
23 potential fire hazard as the short circuit current tries to find a ground path through pipes
24 or other metal structures. In response to this, Toronto Hydro developed an initiative
25 under this segment in 2018 to inspect all of these locations (to be completed by the end

1 of 2023) and take corrective measures (under the Corrective Maintenance program) to
 2 fix potential hazards by the end of 2025.

3

4 **5.2 Customer Location Maintenance Segment Costs**

5 Table 4 provides the Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-
 6 2029) expenditures for this segment.

7

8 **Table 4: Customer Location Maintenance Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Customer Location Maintenance	1.3	1.1	1.3	1.6	1.6	1.5	1.7	1.6	2.0	1.5

9

10 **5.3 Customer Location Maintenance Segment Year-over-Year Variance Analysis**

11 2020 – 2021 Variance Explanation

12 From 2020 to 2021, expenditures decreased by approximate \$0.2 million which was
 13 primarily attributed due to a reduction in the number of customer substations due for
 14 inspection.

15

16 2021 – 2022 Variance Explanation

17 From 2020 to 2021, expenditures increased by approximate \$0.2 million which was
 18 primarily due to an increase in the number of customer substations due for inspection
 19 and the start of inspections of communication systems located in vaults deep
 20 underground.

21

22 2022 – 2025 Variance Explanation

23 Between 2022 and 2025, expenditures are expected to increase by approximately \$0.2
 24 million, or an average of approximately \$0.1 million per year, primarily due to the

1 introduction of inspections of DER sites. Higher costs in 2023 and 2024 are due to the
2 number of customer locations due for inspection and the completion of Delta-Wye
3 inspections in 2023.

4
5 2025 – 2029 Variance Explanation

6 Between 2025 and 2029, expenditures are not expected to materially change. Year-to-
7 year fluctuations are primarily due to varying numbers of customer locations due for
8 inspection. If Toronto Hydro were forced to deliver this segment with a reduced level of
9 funding over the 2025-2029 rate period, the utility could face various risks, including:

- 10 • Reduced ability to comply with applicable legislative and regulatory requirements
11 such as the OEB’s Distribution System Code;
- 12 • Increased safety risks from unauthorized access to energized equipment and
13 faulty communication equipment used by crews in vaults;
- 14 • Increased frequency of equipment failures due to unidentified deficiencies or lack
15 of maintenance leading to increased:
- 16 ○ public and employee safety risks, such as from flashovers or vault fires;
 - 17 ○ environmental risks from oil leaks resulting from unidentified equipment
18 deficiencies such as transformers and cables; and
 - 19 ○ reliability risks from interruptions due to equipment failures.
- 20

21 **6. STATION INSPECTIONS AND AUXILIARY EQUIPMENT MAINTENANCE SEGMENT**

22 **6.1 Segment Description**

23 Toronto Hydro owns equipment at 23 TSs and 139 MSs throughout the City of Toronto.⁵
24 Equipment is located either inside buildings or outside in fenced yards. The Station

⁵ Toronto Hydro’s distribution system is serviced by 37 Terminal Stations. However, it only owns and operates assets at 23 of these stations.

1 Inspections and Auxiliary Equipment Maintenance segment funds the following two
2 categories of work:

- 3 • Periodic inspections of all TSs, MSs, and battery stations and the associated
4 equipment; and
- 5 • Maintenance of auxiliary equipment housed or used at stations including station
6 batteries, air compressors, and testing equipment.

7

8 Figures 6 and 7 below show a typical MS found in a residential neighbourhood, and Figure
9 8 below shows a TS yard.



Figure 6: Residential Area MS (front view)



Figure 7: Residential Area MS (rear view)



Figure 8: The Station Yard at Cavanagh TS

10

1 Periodic inspections of stations are conducted either monthly or semi-annually. During
2 semi-annual inspections, crews look for any signs of transformer oil leaks, confirm
3 transformer cooling fan operation, check battery electrolyte levels, verify the condition
4 of equipment alarms, and look for any visual signs of equipment deterioration or
5 imminent failure. In addition, adjustments to heating and ventilation systems are
6 performed during the spring and fall to ensure assets are protected from damage due to
7 temperature (e.g. turning on or turning off control cabinet heaters) and in the fall, oil
8 samples are collected from power transformers for testing. During monthly inspections,
9 crews also look for deficiencies in station fences, gates, doors, building walls, roofs,
10 danger signs, and lighting.

11

12 Beginning in 2022, Toronto Hydro began performing maintenance activities for Toronto
13 Hydro owned Energy Storage Systems (“ESS”). ESS can be used to provide distribution-
14 level grid support. Toronto Hydro’s Bulwer BESS project has helped the utility develop
15 processes for monitoring and controlling BESS assets on a daily basis, as well as gain
16 experience with creating baselines and measuring peak-shaving success at the feeder
17 level. The implementation of an ESS maintenance program will assist in upkeeping the
18 ESS connected through the Energy Storage System capital segment.⁶ The ESS
19 maintenance activities are focused on inspecting, testing, and cleaning the assets related
20 to the ESS annually. These assets include batteries, transformers, Power Conversion
21 Systems (“PCS”) Inverters, disconnect switches, fire suppression system, pad structures,
22 and HVAC systems. Failure of such equipment can result in fire, oil leaks, significant
23 emergency response, equipment replacement costs, reliability, and power quality issues.
24 Maintenance activities are vital for mitigating the risk of such failures and associated
25 consequences. These inspections will support the safe and reliable functioning of the ESS

⁶ Exhibit 2B, Section E7.2

1 until it reaches its end of life. The inspections of ESS units is a relatively new activity and
2 is expected to grow as more units are installed.

3

4 In addition to inspections, this segment includes the maintenance of station auxiliary
5 equipment. This equipment provides a support or service function and can be described
6 as being peripheral to station power and protection and control equipment. Station
7 auxiliary equipment includes: (i) Battery Banks; (ii) Station Protection Systems; (iii) Station
8 Compressed Air Systems; and (iv) other miscellaneous station apparatus, including station
9 buses, specialized environmental protection systems, and testing equipment. This
10 equipment is described as follows:

- 11 • **Battery Banks:** The protection and control equipment in stations is powered by a
12 direct current (“DC”) supply from battery banks that are similar to those depicted
13 in Figure 9 below, and are charged by station rectifiers (chargers). Stations
14 typically have lead-acid or nickel cadmium batteries. Specialized inspections and
15 tests on these battery banks are conducted every six months for MS and monthly
16 for TS and include cleaning, measurements of specific gravity, voltage, electrolyte
17 level, and temperature, inspection for corrosion on terminals, connections,
18 battery racks and cabinets, and load cycle testing.
- 19 • **Station Protection Systems:** TS and MS stations are equipped with alarms to
20 monitor and ensure proper functioning of various assets in stations including
21 buildings, batteries, compressors, switchgear, and service transformers.
22 Maintenance includes assessing the physical and mechanical conditions of the
23 alarms and coordinating with the control room to perform functional tests. This
24 work is carried out on a one-year cycle.
- 25 • **Compressed Air Systems:** These systems are required to supply dry compressed
26 air for the operation of air blast circuit breakers as depicted in Figure 10. Air blast

1 circuit breakers use compressed air to open their arcing contacts, and to
2 extinguish the electrical arc that forms during breaker operation. There are
3 approximately 14 air compressors used in Toronto Hydro’s 4.16 kV and 13.8 kV
4 stations. These assets are inspected and maintained twice a year.



Figure 9: Station Battery System at George and Duke MS **Figure 10: Air Compressor System**

5
6 Station Inspections and Auxiliary Equipment Maintenance are undertaken to address two
7 broad sets of needs: (i) the need to mitigate the risks posed by deficient or failed
8 equipment and components, including public and employee safety, environmental,
9 financial, and system reliability risks; and (ii) the need to ensure compliance with
10 applicable regulatory requirements such as the Ontario Fire Code and the *Occupational*
11 *Health and Safety Act, 1990*.⁷

12
13 **6.1.1 Station Inspections**

14 Over 2020-2022, Station Inspections identified over 800 deficiencies on average annually.
15 Identified deficiencies requiring corrective action were addressed through the Corrective

⁷ SO 1990, Ch O.9., [*“Occupational Health and Safety Act”*].

1 Maintenance program, or equipment replacement programs as discussed in the Stations
2 Renewal program.^{8,9}

3

4 From a safety perspective, deficiencies at stations within urban and residential settings
5 can pose significant risks. For example, deficiencies at access points such as gates, doors,
6 fences, signs, and other security infrastructure can result in a station becoming accessible
7 to the general public. Such deficiencies can arise due to structural degradation or other
8 common causes including vandalism and wildlife, and can contribute to risk of injury to
9 the general public. Frequent inspections are critical to maintaining secure station sites in
10 a densely populated environment.

11

12 From an employee safety perspective, inspections identify deficiencies with station safety
13 features such as alarms, emergency lightning, burn kits, eyewash stations, first aid kits,
14 and fire extinguishers. This equipment is critical in protecting employees during
15 emergency situations such as station fires. Inspections also enable Toronto Hydro to
16 remain compliant with the Ontario *Fire Protection and Prevention Act* which requires,
17 among others, fire extinguishers to be inspected monthly.¹⁰

18

19 From an environmental perspective, inspections allow for the identification of equipment
20 that is leaking oil (an example of a leaking transformer is depicted in Figure 11). Leaking
21 transformers or cables pose environmental risks, where oil can enter waterways, ground
22 water and potentially sensitive ecological areas. Frequent inspections can identify signs
23 of oil leaks, which can indicate assets that are at risk of failing. Based on such findings,
24 Toronto Hydro can address the leak and prevent equipment failures.

⁸ *Supra* note 5.

⁹ Exhibit 2B, Section E6.6

¹⁰ S.O. 1997, c. 4, [*“Fire Protection and Prevention Act”*].



1 **Figure 11: Oil Leak on a Station Transformer**

2

3 Inspections also identify vegetation concerns and damage to grading and landscaping as
4 depicted in Figure 12. Failure to address these deficiencies can result in customer
5 complaints, damage to stations (i.e. due to poor drainage), and safety risks for employees
6 including accessibility risks from vegetation overgrowth and slip-and-fall risks from poor
7 landscaping.



8 **Figure 12: Damaged Landscaping**

9

10 In addition to identifying deficiencies to mitigate safety and environmental risks, Station
11 Inspection work involves the oil sampling and the testing of power transformers in order
12 to mitigate financial and system reliability risks. Industry-standard oil tests are performed

1 to identify poor conditions and abnormalities that cannot otherwise be detected without
2 a complete disassembly of the transformer. Such tests include: (i) Dissolved Gas Analysis;
3 (ii) Furan analysis; and (iii) tests for acid levels, moisture levels, and other oil quality
4 attributes.

5

6 Oil testing is particularly valuable because it allows Toronto Hydro to identify
7 transformers that may be at a high risk of failure and to schedule corrective action such
8 as oil reclamation or replacement before a catastrophic event occurs. Consequences of
9 such an event can include oil spills, fire, emergency response, substantial equipment
10 replacement costs, and a prolonged power interruption.

11

12 *6.1.2 Auxiliary Equipment Maintenance*

13 As discussed above, Auxiliary Equipment Maintenance is performed to mitigate a variety
14 of risks. Maintenance of station backup battery systems reduces the risk that a station's
15 protection and control system will not operate as required during a power interruption.
16 During such an event, the system's DC power source allows all station protection and
17 control equipment to function and communicate normally. Loss of the backup power
18 supply can have consequences ranging from loss of communication and remote operation
19 capability, to failure of a protecting device to function posing both safety and system
20 reliability risks.

21

22 Maintenance of protection systems ensures the operability and dependability of alarms
23 at station facilities so that Toronto Hydro can be notified and proactively respond to
24 defective equipment before they lead to failure, which in turn can pose safety,
25 environmental, and system reliability risks.

1 The maintenance of compressed air systems is designed to ensure that air blast circuit
 2 breakers are available to operate as designed when required. Without a certain pressure
 3 and volume of compressed air available, the circuit breakers will not close or trip. Failure
 4 to operate during fault conditions will expose employees to the risk of severe burns from
 5 arc flashes. When this occurs, protection devices upstream of the circuit breaker would
 6 need to operate resulting in outages to a far greater number of customers than would
 7 otherwise occur. For example, the failure of an air blast circuit breaker to clear a fault in
 8 July 2012 at George MS and Duke MS resulted in interruptions to 6,500 customers for
 9 nearly eight hours. Replacement costs for an air blast circuit breaker can range from
 10 \$60,000 to \$200,000 depending on factors including breaker type, voltage rating, and
 11 location. As Toronto Hydro eliminates these legacy assets from the system, this risk will
 12 be minimized.¹¹ Maintenance tasks that mitigate the risks described above include
 13 inspections of all components for deficiencies, cleaning of filters, replacement of pressure
 14 relief valves and pump-up time testing which is used to determine their correct operation.
 15

16 **6.2 Station Inspections & Auxiliary Equipment Segment Costs**

17 Table 5 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 18 (2025-2029) expenditures for this segment.
 19

20 **Table 5: Station Inspections & Auxiliary Equipment Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Station Inspections and Auxiliary Equipment Maintenance	1.1	1.1	1.2	1.1	1.1	1.3	1.2	1.2	1.3	1.6

¹¹ Exhibit 2B, Section E6.6.

1 **6.3 Station Inspections & Auxiliary Equipment Year-over-Year Variance Analysis**

2 2020 – 2021 Variance Explanation

3 There is no material variance during this period.

4
5 2021 – 2022 Variance Explanation

6 From 2021 to 2022, expenditures increased by approximately \$0.1 million which is
7 primarily attributed to the introduction of maintenance for ESS units and an increase in
8 costs for semi-annual stations inspections.

9
10 2022 – 2025 Variance Explanation

11 Between 2022 and 2025, expenditures are expected to increase by approximately \$0.1
12 million primarily due an increase in the number of ESSs and a higher volume of auxiliary
13 equipment maintenance, offset by a reduction in the total number of stations requiring
14 inspection and maintenance.

15
16 2025 – 2029 Variance Explanation

17 Between 2025 and 2029, expenditure are expected to increase by approximately \$0.3
18 million, or an average of approximately \$0.1 million per year, primarily due to inflationary
19 pressures and an increase in the number of ESSs. If Toronto Hydro were forced to deliver
20 this segment with a reduced level of funding over the 2025-2029 rate period, the utility
21 could face various risks, including:

- 22
- 23 • Reduced ability to comply with applicable legislative and regulatory requirements
24 such as the OEB's Distribution System Code, Ontario Fire Code, and *Occupational
Health and Safety Act* requirements.
 - 25 • Increased frequency of station equipment malfunctions or failures due to
26 unidentified deficiencies or lack of maintenance leading to increased:

- 1 ○ public safety risks from deficiencies at station access points and other
2 security infrastructure,
3 ○ environmental risks from oil leaks resulting from unidentified equipment
4 deficiencies such as transformers and cables, and
5 ○ reliability risks from the failure of station backup battery systems
6 operating as required during power interruption.

7

8 **7. STATION SWITCHGEAR MAINTENANCE SEGMENT**

9 **7.1 Segment Description**

10 Station Switchgear Maintenance includes testing and maintenance of Toronto Hydro's
11 switchgear units and circuit breakers that are located at TSs and MSs across the utility's
12 service territory. A switchgear unit is a combination of switching devices and their
13 associated controls, measuring, protection, and regulating equipment. Assemblies of
14 these devices and equipment, with associated interconnections, accessories, enclosures
15 and supporting structures, are found at Toronto Hydro's distribution stations. There are
16 approximately 235 switchgears installed within the distribution system and they
17 collectively contain over 1,800 circuit breakers.

18

19 Switchgears and circuit breakers must operate quickly and reliably when an electrical
20 interference or equipment failure causes a fault on the distribution system. Switchgear
21 maintenance activities mitigate the risk that the equipment will malfunction during a
22 contingency, failing to protect the downstream feeders and equipment and possibly
23 leading to a safety incident involving the public or Toronto Hydro employees.

24

25 Toronto Hydro owns and maintains two types of switchgears:

- 26 • The exposed bus type, used mainly for outdoor installations; and

- 1 • The enclosed type, further subdivided into metal clad, metal-enclosed, and brick
2 structures, which are mainly used for indoor installations.

3

4 Examples of switchgear are illustrated in Figure 13 below.



5 **Figure 13: (Left) Outdoor Enclosure Housing Metal clad Switchgear. (Right) Indoor**
6 **Metal clad Switchgear**

7

8 Station Switchgear Maintenance includes three sets of activities.

- 9 1) **Circuit Breaker Maintenance:** Circuit breakers (Figure 14) use various mediums
10 to extinguish the electric arc that forms during an interruption operation. Toronto
11 Hydro owns the following types of circuit breakers: air magnetic, air blast, Sulphur
12 Hexafluoride (“SF₆”), oil, and vacuum units, which are maintained every four
13 years. Circuit breaker maintenance work includes a visual inspection and
14 verification of the integrity of the mechanical and electrical components in circuit
15 breakers, functional testing of the unit, and replacement of worn components.



1 **Figure 14: (Left) KSO Oil Circuit Breaker, (Right) Vacuum Circuit Breaker**

- 2
- 3 **2) Protection & Control (“P&C”) Maintenance:** P&C equipment maintenance
- 4 includes inspection and testing of sensing devices and relays that monitor the
- 5 magnitude and flow of electrical power. In the event of a fault on the distribution
- 6 system, the protective relays detect the fault and trigger interrupting devices,
- 7 such as circuit breakers, to operate and isolate the circuit, protecting the system
- 8 from further damage. A protective relay system has to be periodically tested and
- 9 verified to ensure that the system remains protected, the settings are appropriate
- 10 for the current state and loads, and a failure event does not result in cascading
- 11 outage events. More specifically, maintenance activities involve verifying the AC
- 12 voltage and current to the fault detecting relay, testing the operating
- 13 characteristics of the relay, validating relay settings, verifying the operation of
- 14 auxiliary relays, and verifying output functions such as alarms and annunciations.
- 15 This equipment is maintained every four years.
- 16 **3) Thermography and Ultrasonic Testing:** A thermographic scan of a switchgear unit
- 17 provides Toronto Hydro with an advanced warning of developing electrical faults
- 18 by identifying thermal anomalies on the equipment. Ultrasonic testing identifies
- 19 high-frequency noise associated with surface tracking and corona, which are also

1 indicators of impending failure. All load break switches, disconnect switches, and
2 bolted electrical connections undergo thermographic scans and ultrasonic tests
3 every four years.

4
5 Maintenance activities are designed to reduce the likelihood of switchgear or breaker
6 failure and to mitigate the associated risks. One way that this is accomplished is by
7 identifying deficiencies that can lead to common switchgear failure modes. These
8 deficiencies include worn components, loose connections, degradation, corrosion, and
9 contamination. Examples of these are shown in Figures 15 and 16, which illustrate a
10 corroded switchgear enclosure and pest infestation inside an outdoor switchgear.



Figure 15: Rusted Switchgear Enclosure



**Figure 16: Pests Inside Outdoor
Switchgear**

11

12 Figure 17 below shows an example of an internal arc fault, which can be destructive and
13 pose a risk of injury because of the energy levels reached within the confined
14 compartment.



Figure 17: Impact of Internal Arc Fault in a Switchgear

1

2

3 Toronto Hydro has identified over 1,700 deficiencies on switchgear assets during between
4 2020 and 2022.

5

6 The likelihood of deficiencies existing and leading to a failure increases as switchgear and
7 breakers age and approach their end-of-life. The average expected lives of switchgear
8 enclosures and circuit breakers are 50 and 45 years, respectively.

9

10 Of particular concern are the high numbers of air magnetic, air blast, and oil breakers that
11 have exceeded their expected life. The likelihood of failure increases for these assets due
12 to wear and tear caused by high occurrences of operations, contamination, loose
13 connections, and corrosion.

14

15 Toronto Hydro's Asset Condition Assessment indicates that over 35 percent of the
16 population of switchgear have moderate to material deterioration and are at an increased

1 likelihood of failure.¹² A failure of one of these assets has the potential to lead to a
2 catastrophic fire, release harmful contaminants into the environment (e.g. oil spills,
3 combustion by-products), and safety risks in the form of debris or arc-flashes that can
4 cause injury and property damage. The replacement of worn and corroded components,
5 the alignment of switch blades, the lubrication of switches, and the removal of dirt and
6 other contamination during maintenance mitigates the risk of failures and associated
7 employee safety, financial, environmental, and system reliability risks that are associated
8 with switchgear failure.

9

10 An example of a catastrophic station failure occurred at Station J in East York in 2009. The
11 station was over 50 years old at the time, and a fire broke out following a switchgear
12 failure and subsequent fault. The switchgear had surpassed its expected life and the fault
13 resulted in the destruction of Station J. Maintenance, including thermographic scans and
14 ultrasonic tests, serves to prevent similar occurrences by detecting defective components
15 (e.g. closing coil, pallet switch, closing spring, and relay systems) and incipient faults in
16 loose connections, contacts, and insulators that could develop into a catastrophic failure
17 from the failure of a protection and control asset to operate and clear a fault.

18

19 The financial consequences of failures of switchgear and circuit breakers are also
20 significant. The replacement of a circuit breaker can exceed \$100,000 and approach \$1
21 million depending on various factors including breaker type, voltage rating, and location.
22 The total replacement cost of a transformer station switchgear, including the costs of the
23 enclosure and circuit breakers, is approximately \$6 million and can take over 3 years to
24 design and construct. These costs significantly exceed the annual cost of switchgear

¹² Exhibit 2B, Sections D1 and D3

1 maintenance activities. As such, the prevention of even one catastrophic failure over a
2 multi-year period will offset the planned maintenance expenditures during the period.

3

4 In addition to mitigating safety, environmental, and financial risks, Switchgear
5 Maintenance provides customer value by mitigating system reliability risks. A failure of
6 station switchgear or a circuit breaker can result in a large number of customer
7 interruptions and long interruption durations. Between 2020 to 2022, Toronto Hydro
8 experienced four incidents on average annually that were related to switchgear failures,
9 which resulted in an average of over 2,900 customers interruptions and 3,300 customer
10 hours of interruption annually on average.

11

12 Not all switchgear failures are catastrophic in nature and some are as small as the failure
13 of a breaker to open and close. This was the case on May 3rd, 2019, when a vacuum circuit
14 breaker failed to trip and clear a fault, which resulted in over 4,400 customer
15 interruptions and 17,000 customer hours of interruption. Nevertheless, these failures
16 impact system reliability, as protection systems are designed to coordinate with each
17 other, with the intent of isolating the fault or failure to the smallest possible area within
18 the distribution system. If a protection device were to fail to function, a protection device
19 located further upstream would operate. Such a scenario results in outages impacting
20 greater numbers of customers and system assets as well as increasing the safety risks to
21 employees and members of the public in proximity to the stations. Failure of protection
22 devices on the distribution system could also result in the fault migrating to the
23 transmission system, leading to even larger outages. Maintenance tasks are designed to
24 ensure protection devices operate as designed. During maintenance, crews verify and
25 correct improper settings onsite, including: (i) verifying that the voltage and current
26 settings on the fault detecting relays are correct for the system element being protected;

1 (ii) verifying that the operating characteristics of the fault detecting relays are correct for
 2 the applied setting; and (iii) verifying that the operation of auxiliary relays and output
 3 functions, such as circuit breaker tripping and annunciation, are correct.

4

5 **7.2 Station Switchgear Maintenance Segment Costs**

6 Table 6 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 7 (2025-2029) expenditures for this segment.

8

9 **Table 6: Station Switchgear Maintenance Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Stations Switchgear Maintenance	2.7	3.2	2.4	2.8	3.4	4.1	3.6	3.6	4.2	4.5

10

11 **7.3 Station Switchgear Maintenance Segment Year-over-Year Variance Analysis**

12 2020 – 2021 Variance Explanation

13 From 2020 to 2021, expenditures increased by approximately \$0.5 million which was
 14 primarily attributed to higher unit costs due to the complexity of the units maintained
 15 and higher material costs due to global supply chain issues.

16

17 2021 – 2022 Variance Explanation

18 From 2021 to 2022, expenditures decreased by approximately \$0.8 million which was
 19 primarily attributed to maintaining fewer and less complex units.

20

21 2022 – 2025 Variance Explanation

22 Between 2022 and 2025, expenditures are expected to increase by approximately \$1.7
 23 million, or an average of \$0.6 million per year, primarily due to inflationary pressures and
 24 the lower complexity of units maintained in 2022.

1 2025 – 2029 Variance Explanation

2 Between 2025 and 2029, expenditures are forecast to increase by approximately \$0.4
3 million, or an average of \$0.1 million per year, primarily due to inflationary pressures.
4 Year-to-year fluctuations are due to differences in the relative volume and complexity of
5 units maintained each year. If Toronto Hydro were forced to deliver this segment with a
6 reduced level of funding over the 2025-2029 rate period, the utility could face various
7 risks, including:

- 8 • Increased frequency of station switchgear or circuit breaker malfunctions or
9 failures due to unidentified deficiencies or lack of maintenance leading to
10 increased:
- 11 ○ public or employee safety risks from fire, debris, or arc flashes;
 - 12 ○ environmental risks from release of contaminants such as oil or
13 combustion byproducts;
 - 14 ○ financial risks from high cost to replace station switchgear; and
 - 15 ○ reliability risks from the switchgear or circuit breaker malfunction during a
16 contingency leading to additional outages.

17

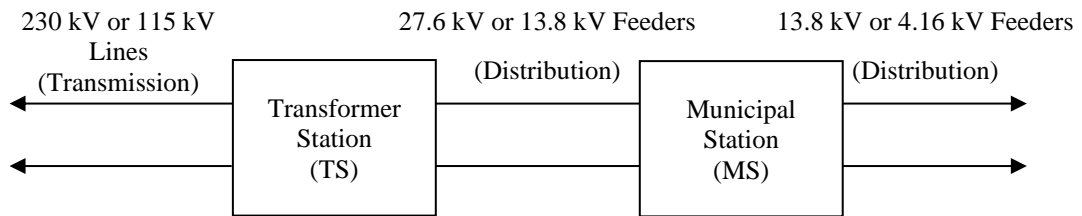
18 **8. STATION EQUIPMENT MAINTENANCE SEGMENT**

19 **8.1 Segment Description**

20 The Station Equipment Maintenance segment addresses equipment located at 23 TS and
21 139 MS locations, including 183 station power transformers. TSs are points of power
22 supply from the Hydro One transmission system to Toronto Hydro's distribution system.
23 These stations step down supply voltages from 230 kV or 115 kV to 27.6 kV or 13.8 kV,
24 utilizing transformers that, with two exceptions, are owned by Hydro One.¹³ MSs are
25 stations within Toronto Hydro's distribution system that are supplied by Toronto Hydro

¹³ Copeland TS and Cavanagh TS.

1 feeders, at 27.6 kV or 13.8 kV, and step down voltage to 13.8 kV or 4.16 kV. Toronto
2 Hydro owns and maintains all equipment at MSs, including the transformers, and while
3 Toronto Hydro's distribution system is supplied by 37 TSs, it owns and maintains a large
4 number of equipment at 23 TSs.



5 **Figure 18: System Configuration**

6
7 Figures 19 and 20 below depict examples of station power transformers at Toronto
8 Hydro's stations.



9
10 **Figure 19: Power Transformer at Cavanagh TS**



11 **Figure 20: Power Transformer at Neilson Dr. MS**

12 Station power transformers are essential components of every station and a large number
13 have exceeded their expected useful lives. A majority of Toronto Hydro's transformers

1 were installed in the 1950s through the 1970s. The average useful life of these units is 45
2 years and over half of the entire population is beyond its useful life.

3

4 As transformers age, maintenance becomes increasingly important to ensure that the
5 core and windings continue to function within acceptable parameters, insulating
6 properties do not deteriorate excessively, and auxiliary equipment such as gauges and
7 alarms are functioning properly to detect and provide early warnings of problems such as
8 oil leakage, gases in the oil, and overheating.

9

10 Maintenance activities are focused on inspecting, testing, and cleaning assets, including
11 power transformers and their auxiliary equipment, current transformers, potential
12 transformers, station service transformers, DC batteries, chargers, disconnect switches,
13 load break switches, fuses, interconnect cables, and remote terminal units. Failure of
14 such equipment, and in particular, the failure of power transformers, can result in station
15 fires, oil leaks, significant emergency response and equipment replacement costs, and
16 power interruptions impacting a large number of customers. Maintenance activities are
17 vital for mitigating the risk of such failures and associated consequences. Maintenance
18 activities also help to extend the useful life of equipment by promptly identifying failing
19 insulation, deterioration of insulating oil, and transformer winding irregularities such as
20 shorted turns, all of which can cause catastrophic equipment failure if not addressed in a
21 timely manner.

22

23 The Station Equipment Maintenance segment does not include maintenance of station
24 switchgear, which is captured in the dedicated Station Switchgear Maintenance segment.
25 Examples of activities that are undertaken as part of Station Equipment Maintenance are:

- 1 • Comprehensive transformer testing including winding resistance and power factor
- 2 testing to evaluate the insulation integrity of the core and windings;
- 3 • Cleaning of power transformer bushings to remove contamination that can lead
- 4 to tracking and flashovers;
- 5 • Inspections and calibrations of transformer auxiliary equipment such as relays,
- 6 temperature and oil gauges, and alarms;
- 7 • Verifying the integrity of all clamped and bolted connections on primary feeders,
- 8 insulators, bushings, secondary feeders and buses;
- 9 • Cleaning and testing of on-load tap changers, which are devices used to regulate
- 10 voltage; and
- 11 • Testing of transfer trip relays between a MS transformer (at 4 kV) and the
- 12 upstream 13.8 kV or 27.6 kV supply feeder.

13

14 Station Equipment Maintenance, including the aforementioned activities, requires
15 planned outages and is scheduled on a four-year cycle. In this regard, preventative and
16 predictive tools and tests are employed during maintenance to prevent and identify
17 deterioration on equipment that can lead to failures and associated consequences.

18

19 As illustrated in Figure 21 below, Toronto Hydro has identified on average 44 deficiencies
20 on station equipment each year since 2020.

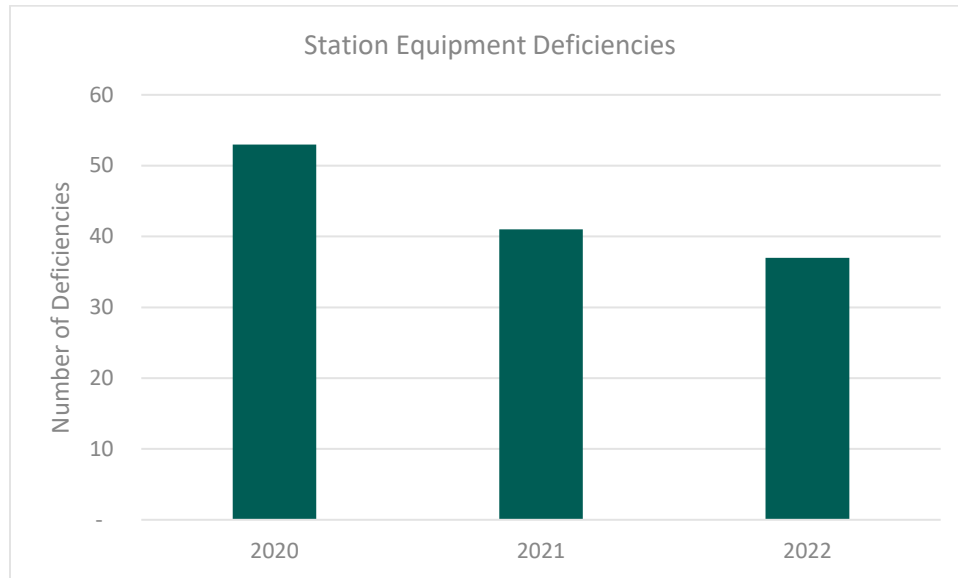


Figure 21: Station Equipment Deficiencies Identified Between 2020 and 2022

1
2
3
4
5
6
7
8
9

When equipment failures occur (e.g. on a power transformer), they pose significant safety, environmental, financial, and system reliability risks. An example of a transformer failure is one that occurred at Dupont MS in 2003. The 49-year old transformer failed and resulted in a fire that caused damage to two other power transformers at the station and caused oil and fluids to spill into the station. This event interrupted 5,675 customers, resulting in over 23,341 customer hours interrupted. The entire outage lasted for 6.6 hours. Figures 22 to 24 show the damage caused by this incident.



Figure 22: Failed Power Transformer

1

2



Figure 23: Damages to the MS Wall



Figure 24: Leaking Fluids from Failed Transformer

3

4 The safety risks associated with a failure of this nature include station fires and flashovers
5 which can cause injury to employees in a station. Further, associated environmental risks
6 include the spillage of oil from ruptured transformer oil tanks which can contaminate
7 ground water, soil and environmentally sensitive locations, as well as the release of
8 hazardous combustion by-products.

1 During 2020-2022, Toronto Hydro experienced seven outage incidents cause by failed
2 station transformer equipment. Fortunately, none of these incidents were of the
3 magnitude of the failure at Dupont MS in 2003; however, they did cause over 8,200
4 customer interruptions and 13,200 customer hours of interruption over the three-year
5 period and thousands of dollars in emergency response costs. From a financial
6 perspective, transformer failures can result in emergency response and equipment
7 replacement expenditures that are estimated to range between \$0.2 million and \$4
8 million. Given these figures, the mitigation of even one costly failure can result in savings
9 that substantially offset the cost of the Station Equipment Maintenance program.

10

11 Although power transformer failures pose the greatest risk within stations, it is important
12 to note that Station Equipment Maintenance mitigates failures on various other types of
13 station equipment which can also cause significant safety, environmental, financial and
14 system reliability risks. One example is load break switches, which are used to supply and
15 isolate the primary voltage feed to a power transformer at MSs. These switches are
16 installed in outdoor enclosures at 27.6 kV. A failure of such a switch can cause a station
17 outage and significant safety risks as these switches are often operated manually. To
18 ensure the successful operation of a switch during fault conditions, maintenance activities
19 include cleaning insulators, lubricating contacts and gears, checking blade alignment, and
20 conducting electrical tests such as contact resistance, insulation resistance and fuse
21 resistance tests. Another example is station service equipment, which supplies batteries,
22 ventilating systems, lighting, and cranes. A failure of this equipment can result in the loss
23 of power to station protection equipment, the loss of remote communication and control
24 functions, overheating of switchgear, and various other risks. Maintenance mitigates the
25 risk of these failures occurring.

1 **8.2 Station Equipment Maintenance Segment Costs**

2 Table 7 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 3 (2025-2029) expenditures for this segment.

4
 5 **Table 7: Station Equipment Maintenance Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Station Equipment Maintenance	0.8	1.0	0.6	1.0	0.9	1.1	1.1	1.3	1.1	1.2

6

7 **8.3 Station Equipment Maintenance Segment Year-over-Year Variance Analysis**

8 2020 – 2021 Variance Explanation

9 From 2020 to 2021, expenditures increased by approximately \$0.2 million due to a
 10 greater number and complexity of units maintained and higher material costs due to
 11 global supply chain issues.

12

13 2021 – 2022 Variance Explanation

14 From 2021 to 2022, expenditures decreased by approximately \$0.4 million due to a
 15 decrease in the number and complexity of units maintained.

16

17 2022 – 2025 Variance Explanation

18 Between 2022 and 2025, expenditures are expected to increase by approximately \$0.5
 19 million, or an average of \$0.2 million per year, primarily due to inflationary pressures and
 20 the lower complexity of units maintained in 2022.

21

22 2025 – 2029 Variance Explanation

23 Between 2025 and 2029, expenditures are forecast to increase by approximately \$0.1
 24 million due to inflationary pressures. Year-to-year fluctuations are due to differences in

1 the relative volume and complexity of the units maintained. . If Toronto Hydro were
2 forced to deliver this segment with a reduced level of funding over the 2025-2029 rate
3 period, the utility could face various risks, including:

- 4 • Increased frequency of station equipment, such as power transformers or load
5 break switches, malfunctions or failures due to unidentified deficiencies or lack of
6 maintenance leading to increased:
 - 7 ○ safety risks due to fires or flashovers;
 - 8 ○ environmental risks from oil leaks or combustion by-products resulting
9 from unidentified equipment deficiencies;
 - 10 ○ reliability risks from power interruptions impacting a large number of
11 customers; and
 - 12 ○ financial risks from emergency response and equipment replacement
13 costs.

1 **CORRECTIVE MAINTENANCE**

2

3 **1. OVERVIEW**

4 **Table 1: Corrective Maintenance Program Summary**

Corrective Maintenance Program									
Outcomes: Operational Effectiveness - Safety, Environmental, and Operational Effectiveness – Reliability									
Segments:									
<ul style="list-style-type: none"> • Corrective Maintenance 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
23.1	26.5	23.5	24.9	25.6	29.5	30.7	31.0	32.0	33.6

5 As part of the Corrective Maintenance program (the “Program”), the utility undertakes
 6 actions to address deficiencies or substandard conditions across the distribution system
 7 that are identified during the normal course of operations. This includes deficiencies or
 8 substandard conditions identified through activities undertaken as part of the
 9 Preventative and Predictive Maintenance programs or the Emergency Response program.
 10 ¹ Corrective Maintenance activities are generally high priority, cover short planning
 11 horizons (given the risks that deficiencies and substandard conditions can pose if left
 12 unaddressed), and involve repairing/restoring assets to their normal operating conditions
 13 through maintenance, refurbishment, and/or minor component replacements, which
 14 include but are not limited to colour harmonization for Station breakers, Faulted Circuit
 15 Indicator (“FCI”) replacement, and many more. This program also addresses Electrical
 16 Safety Authority (“ESA”) related compliance issues, such as delta-wye corrective work and
 17 cap and grounding of unused lines above 750 volts for both the overhead and
 18 underground systems.

¹ Exhibit 4, Tab 2, Schedule 5.

1 Toronto Hydro's primary objective for this Program is to contribute to maintaining safety,
2 environmental integrity, and overall system reliability by correcting or repairing
3 deficiencies or substandard conditions on the distribution system. Additionally, where
4 feeders are performing particularly poorly and are at risk of exceeding thresholds set for
5 FESI-7 (Feeders Experiencing Sustained Interruptions of 7 or more), or FESI-6 Large
6 Customer (Key Account Feeders Experiencing Sustained Interruptions of 6 or more), line
7 patrols are conducted by field crews to assess the condition of equipment on the feeder
8 and identify quick, targeted actions that yield immediate reliability improvements. Any
9 capital work identified through these line patrols is addressed through the Worst
10 Performing Feeder segment within the Reactive and Corrective Capital program.²

11

12 There has been a rise in the volume of corrective work requests attributed to
13 deteriorating asset condition and asset-related safety risks to crews or the general public.
14 Furthermore, the increase in corrective work requests is due to enhanced inspection
15 forms and introducing new inspection work, such as cable diagnostic testing,³ which
16 identifies additional deficiencies that may need to be addressed. This results in
17 approximately \$20 million worth of backlog for the lower priority ("P3", requiring
18 resolution within 180 days) work requests, which will need to be addressed before the
19 issues worsen and cause a system fault which may lead to a power outage, or other safety
20 incidents. Hereafter, any reference to backlog is for P3 deficiencies only. To help manage
21 this risk, the corrective work requests in the backlog have been further prioritized by level
22 of risk (e.g. High, Medium and Low) within P3 priority, and by the primary and secondary
23 impact (e.g. Environmental, Safety, Reliability, Operations) of the deficiency so that
24 Toronto Hydro can target the work that address the greatest risk. An example of a high-
25 risk deficiency includes, but is not limited to, extensive rotting on a crossarm which need

² Exhibit 2B, Section E6.7.

³ Exhibit 4, Tab 2, Schedule 2.

1 to be replaced or a leaning pole that will need to be straightened to avoid reliability and
 2 safety issues. A low-risk example includes, but is not limited to, replacing a cracked phase
 3 barrier or removing graffiti.

4
 5 With aging assets and the enhancements of Toronto Hydro’s Preventative and Predictive
 6 Maintenance programs,⁴ and ramp up of newer inspection programs such as cable
 7 diagnostic testing, additional deficiencies are expected to be identified, resulting in a
 8 continuous overall increase in corrective follow-up work as reflected in the proposed
 9 2025-2029 expenditures for the Corrective Maintenance program.

10
 11 **2. OUTCOMES AND MEASURES**

12 **Table 2: Corrective Maintenance Program Outcomes and Measures Summary**

<p>Operational Effectiveness - Safety</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s public and employee safety objectives by: <ul style="list-style-type: none"> • Promptly repairing high-risk assets approaching imminent failure. • Eliminating risks such as trip hazards caused by sink holes on sidewalks, lack of pole guy(s) and/or washing insulators located in high contamination areas to prevent flashover and pole fires. • Detecting and eliminating energized stray/contact voltage (4.5 volts or greater), on surfaces and structures within Toronto Hydro’s distribution system.
<p>Environment</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s environmental objectives by: <ul style="list-style-type: none"> • Repairing cables and splices exhibiting signs of oil deficiency to prevent oil spills into the environment. • Preventing excessive corrosion by cleaning oil-filled equipment and applying corrosion inhibiting coatings.

⁴ Exhibit 4, Tab 2, Schedules 1-3.

Operational Effectiveness - Reliability	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s system reliability objectives (e.g. SAIFI, SAIDI, FESI-7, FESI-6 Large Customer) by: <ul style="list-style-type: none"> • Repairing and restoring assets through corrective maintenance to acceptable operating conditions. Examples include but are not limited to, FCI replacement, animal guard installation, spot tree trimming and crossarm replacement due to rotting.
--	---

1 **3. PROGRAM DESCRIPTION**

2 Toronto Hydro’s primary objective for this program is to contribute to maintaining the
 3 safety of Toronto Hydro’s work crew and general public, environmental integrity, and
 4 overall system reliability. This is accomplished by correcting or repairing deficiencies or
 5 substandard conditions on the distribution system. Furthermore, this program addresses
 6 ESA compliance issues, such as the cap and grounding of unused lines above 750 volts for
 7 both overhead and underground systems and the delta-wye program.

8
 9 Deficiencies or substandard conditions across Toronto Hydro’s distribution system are
 10 identified through the normal course of field operations, which include line patrols
 11 conducted on poorly performing feeders (Worst Performing Feeders, or “WPF”), the
 12 Preventative and Predictive Maintenance programs, the Emergency Response program
 13 and/or customer communication, as shown in Figure 1 below. Identified deficiencies or
 14 substandard conditions are subsequently addressed through a variety of programs:⁵

- 15
 16
 - Corrective Maintenance program;
 - 17 • Reactive and Corrective Capital program⁶;

⁵Exhibit 2B, Section D3.

⁶ *Supra* note 2.

- 1 ○ Phone calls from customers to Toronto Hydro;
- 2 ○ External emails to Toronto Hydro;
- 3 ○ Observations by field crews during the normal course of operations;
- 4 ○ Customer inquiries requiring field assessment and follow up;
- 5 ○ Line patrol for Worst Performing Feeder Program.
- 6 ● **Emergency Response:** Corrective work can also be required as a result of
- 7 emergencies or unplanned system events. These include asset failures and
- 8 deficiencies identified outside of Toronto Hydro's daily (planned) operations but
- 9 requiring follow-up remediation in order to permanently restore power or
- 10 eliminate safety or environmental risks.

11

12 All deficiencies from the above sources are reviewed to validate the need for reactive
13 intervention, assess the nature of reactive intervention required (Capital versus
14 Maintenance), and the priority level to be assigned to each deficiency request. For the
15 Corrective Maintenance Program, Toronto Hydro uses a prioritization framework that
16 classifies asset deficiencies into four categories and addresses the deficiencies by
17 generating a work request notification:⁷

18

- 19 (i) P1 requires resolution within 15 days;
- 20 (ii) P2 requires resolution within 60 days;
- 21 (iii) P3 requires resolution within 180 days; and
- 22 (iv) P4 which indicates that conditions are to be monitored.

23

24 The scope of the corrective maintenance work includes all overhead and underground
25 assets, municipal and transformer stations. It also includes other work, such as stations

⁷ Work requests are forms issued to assign and schedule corrective work to be performed by Toronto Hydro crew.

1 decommissioning, work required to address ESA Compliance issues, and temporary
2 follow-up repairs to assets during an emergency event, but excludes emergency repair
3 work managed under the Emergency Response program. More specifically, the Corrective
4 Maintenance program consists of the following activities:

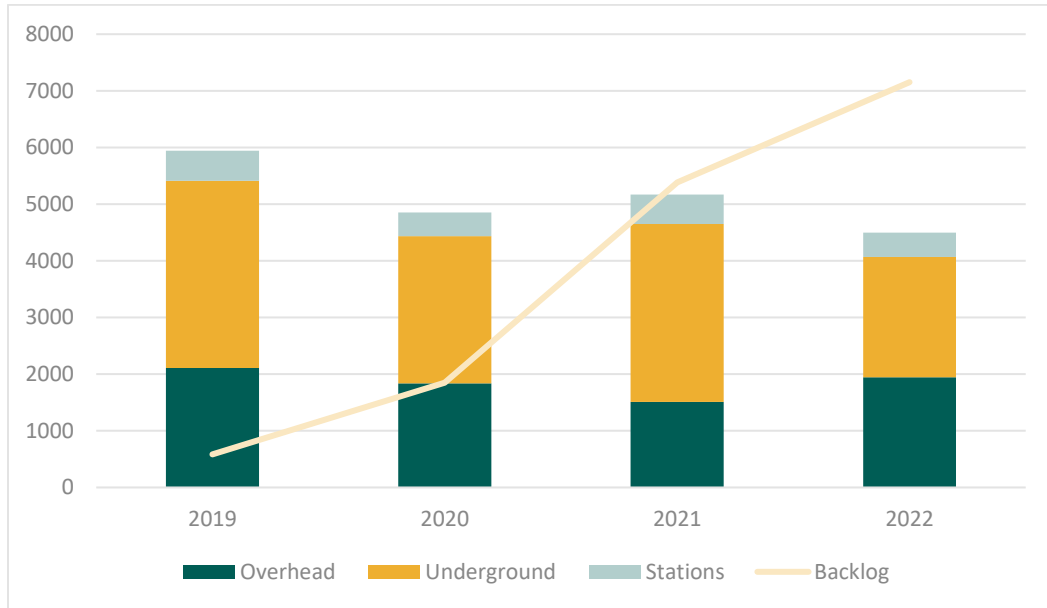
- 5
6 • **Distribution Overhead Maintenance:** Corrective restoration of equipment and
7 replacement of components that are part of the overhead distribution system,
8 including conductor, conductor splices, insulators, brackets, surge arresters, pole-
9 mounted transformers, and overhead switches. Work includes, but is not limited
10 to:

- 11 ○ Vegetation management in response to off-cycle requests; spot trimming
12 needs identified by Toronto Hydro crews or direct customer
13 communication, such as dying or damaged tree limbs and branches, major
14 storm damages, or excessive tree growth that threatens overhead
15 distribution lines or poses system reliability risks;
- 16 ○ Installing missing animal guards, guy guards, ground wire and/or surge
17 arresters; and
- 18 ○ Patrols and spot maintenance of poorly performing feeders, which targets
19 non-Key Account feeders that are at risk of experiencing seven or more
20 sustained outages (FESI-7) or Key Account feeders that are at risk of
21 experiencing 6 or more sustained outages (FESI-6 Large Customer) over a
22 rolling 12-month period. Typical work includes installation of insulated
23 drop leads, animal guards, and replacement of vintage porcelain cut-out
24 switches mounted on steel brackets at overhead transformer locations
25 that are prone to tracking.

- 1 • **Distribution Underground Maintenance:** Restoration of equipment that is part
2 of the underground and network distribution system, including cables, cable
3 splices, vaults, ducts, vents, hatchways, transformers, and switchgears. Work
4 includes, but is not limited to:
- 5 ○ Leveling surfaces to eliminate tripping hazards;
 - 6 ○ Installing or replacing FCIs and/or fuses; and
 - 7 ○ Equipment CO₂ washing, which cleans excessive dirt, debris, and
8 contamination from energized equipment in below-grade and pad-
9 mounted installations to prevent arcing and flashover risks.
- 10
- 11 • **Stations Maintenance:** Corrective repairs to station equipment such as
12 transformers, tap changers, cooling systems, switchgear, bus-bars, air
13 compressors, circuit breakers, relays, remote terminal units, and SCADA systems.
14 Work includes, but is not limited to:
- 15 ○ Repairing battery charger, breakers, alarms, gauge, fuses, RTU and
16 repeater radio;
 - 17 ○ Installing ground, locks or barriers; and
 - 18 ○ Replacing arrester, FCI, sensor and/or silica gel.
- 19

20 These activities are critical to maintaining distribution lines and stations assets, as assets
21 are exposed to normal degradation processes (e.g. corrosion, water ingress, heavy
22 loading) and external forces (e.g. adverse weather, tree contacts, foreign interference)
23 that cause deficiencies and accelerate asset deterioration. The Preventative and
24 Predictive Maintenance program sets out the number of deficiencies that Toronto Hydro

1 identifies annually for a variety of assets.⁸ Figure 2 below shows a breakdown of the
2 number and types of corrective work issued and the P3 backlog between 2019 and 2022.



3 **Figure 2: Historical Corrective Work Requests Issued and P3 Backlog**

4
5 As shown in Figure 2, there has been a rise in the volume of corrective work in the P3
6 backlog due to the proportion of assets exhibiting deteriorating conditions and exceeding
7 their expected lives, thereby elevating the risk of failure across the distribution system.

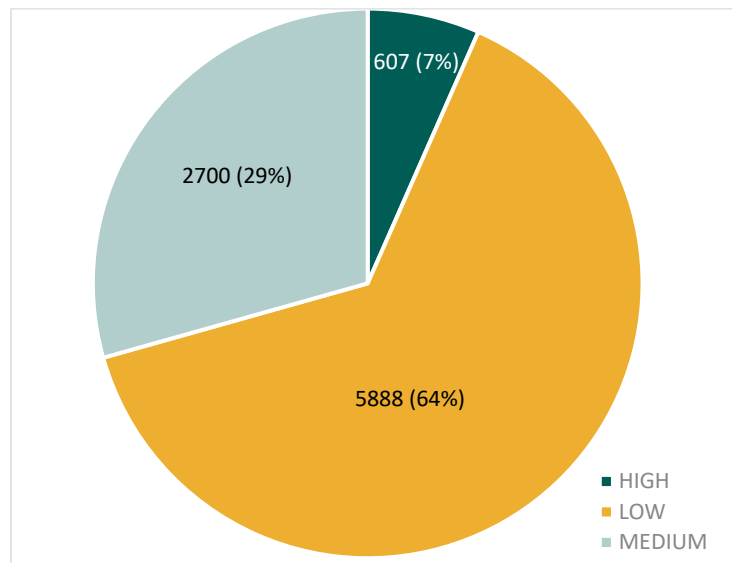
8
9 Toronto Hydro also enhances inspection forms when required, which contributes to
10 capturing greater details about substandard conditions found during inspections and
11 therefore increasing the P3 backlog volume. As a result of these updates, Toronto Hydro
12 continuously improves its process for capturing deficiencies and determining the
13 appropriate corrective action. This provides the utility with greater visibility into asset
14 health and allows for more effective condition assessment and risk mitigation.

⁸ Exhibit 4, Tab 2, Schedules 1-3.

1 Consequently, the number of deficiencies reported from Preventative and Predictive
2 maintenance activities increased significantly for deficiencies such as trip hazards, vault
3 grounding, rack repair, and nomenclatures which contributed to the higher volume of
4 corrective work requests and the P3 backlog.

5

6 There is approximately \$20 million in the P3 backlog, of which the medium and high risks
7 items make up approximately 35 percent and will need to be resolved before a fault in
8 the system occurs that could lead to a bigger issue. However, even for the low-risk
9 deficiencies, there is still a possibility of the deficiency worsening over time. For example,
10 a damaged pole anchor may be considered a medium risk initially, but if not addressed
11 over time then it could lead to the pole leaning and subsequently breaking, which will
12 affect safety and reliability. Similarly, for a low-risk deficiency such as replacement of
13 primary cable rack, if left unaddressed for too long could lead to cable damage which can
14 cause an outage. For this reason, Toronto Hydro needs to invest in reducing the P3
15 backlog, and manage it moving forward.



16

Figure 3: Risk Levels for P3 Backlog of Work Requests

1 On average, approximately 8,000 corrective work requests were generated each year
2 between 2019-2021, which increased to over 11,000 requests in 2022, with the majority
3 targeting underground system assets such as vaults, cable chambers, and pad-mounted
4 equipment. In general, corrective maintenance needs tend to vary both in the volume
5 and type of work required from year to year.

6

7 From a safety perspective, corrective maintenance addresses deficiencies that, if ignored,
8 could endanger members of the public and/or Toronto Hydro employees. For example,
9 a deficiency that is routinely found during overhead line patrols, using infrared
10 thermography, is a thermal anomaly (or “hot spot”) on a conductor splice. Hot spots are
11 evidence of over-heating within the splice and, if not addressed in a timely manner, could
12 result in a live conductor failing, falling to the ground, and energizing the surrounding
13 area. Such a condition presents an unacceptable risk that must be mitigated through
14 corrective maintenance in a timely manner. Other examples may include trip hazards on
15 sidewalk due to unlevel ground around Toronto Hydro owned assets, which contributes
16 to the total number of Public Incident Risks or presence of stray voltage which can impact
17 public safety.

18

19 From an environmental perspective, corrective maintenance mitigates the risk of oil leaks
20 and premature equipment failures. For example, a cable splice leaking oil must be
21 repaired promptly to prevent oil from entering the soil, drains, and waterways.
22 Furthermore, an oil-filled transformer that is at risk of corroding should be maintained in
23 a clean state, free of contaminants that can act as catalysts for corrosion. As part of the
24 Corrective Maintenance program, Toronto Hydro cleans dirty vaults and padmounted
25 installations and applies corrosion inhibiting coatings to equipment to prevent excessive
26 corrosion and the possibility of subsequent oil leaks. Corrective maintenance activities

1 directed at corrosion prevention also serves to mitigate financial risks. Over recent years,
2 greater emphasis has been placed on identifying the year manufactured on underground
3 transformers to confirm potential risk of PCB containing assets, and identifying corrosion
4 at the base of the transformer. In 2021, inspection questions were modified to include
5 the manufactured year for all transformers.

6
7 From a reliability perspective, corrective maintenance addresses deficiencies that, if
8 ignored, will result in unnecessary interruptions for customers and affect reliability
9 metrics such as SAIDI, SAIFI, FESI-7 or FESI-6 Large Customer. For example, depending on
10 the specific location of a spliced conductor (e.g. main trunk, lateral, sub-lateral), there
11 may be a power interruption to hundreds of customers and key customers (e.g. hospitals)
12 if the splice fails due to a hot spot. Other deficiencies that pose similar system reliability
13 risks include, but are not limited to, deteriorated components such as insulators,
14 mounting brackets, cross-arms, broken ground wire, guy wires, overgrown vegetation,
15 failed surge arresters and/or conductor clearance issues (e.g. excessive conductor sag). In
16 aggregate, these individual deficiencies pose significant reliability risks.

17
18 As part of Customer Engagement,⁹ “Reliable Service” was identified as a top customer
19 need, and ranked in the top three needs for residential, small business, commercial and
20 industrial for both Key Account and non-key account customers. When asked specifically
21 about their top three reliability priorities, the frequency of power outages was identified
22 across all customer classes. This program is intended to address these needs, among
23 others, by ensuring essential work is issued in a timely manner to reduce unnecessary
24 interruptions.

⁹ Exhibit 1B, Tab 3, Schedule 1.

1 Corrective maintenance work can extend the life of assets and defer the need for capital
2 equipment replacement expenditures. An example is caulking which is applied to civil
3 infrastructure such as underground vaults. Caulking seals cracks in concrete and
4 minimizes damage from moisture ingress. If caulking is not applied, cracks can grow to
5 threaten the structural integrity of civil infrastructure and result in expensive vault
6 rebuilds which can increase the cost of repair from hundreds of dollars to thousands of
7 dollars to repair. Water ingress can also accelerate corrosion of equipment, leading to
8 premature failure and associated costs.

9

10 Toronto Hydro needs to address any ESA Compliance issues as they are identified, and
11 this type of work is funded by this Program. Two recent examples of work Toronto Hydro
12 has been doing in this Program to address such issues are cap and grounding unused lines
13 above 750 volts and 'Delta-Wye' corrective work. Unused primary lines above 750 volts
14 are required to be removed completely and, if the removal is not feasible, then the cable
15 is required to be deenergized, disconnected, and grounded at each end in order to
16 provide permanent protection and compliance with ESA requirements and Section 11 of
17 Ontario Regulation 22/04. The unused lines are found both overhead and underground,
18 such as in submersible vaults, URD (Underground Residential Design), CRD (Compact
19 Radial Design), and building vaults.

20

21 Regarding Delta-Wye corrective work, the ESA has identified potential fire and shock
22 hazard posed by 3-phase grounded wye-connected secondary transformation with no
23 grounded neutral conductor between the transformer's secondary neutral terminal and
24 the customer's service entrance equipment. When there is a phase-to-ground fault, there
25 is no defined path for the fault current to follow. A fire hazard could be present where
26 the fault current tries to find an alternate path (e.g. metallic gas pipe, communication

1 cable, etc.). The ESA issued a Flash Notice in 2018 to ensure that utilities have a path
2 forward to address these issues and ensure compliance with the ESA requirements under
3 Ontario Regulation 22/04.

4

5 The emergence of such compliance issues and the extent of the work (and costs) required
6 to address them are unpredictable. If anything, as the complexity of the distribution
7 system increases with the energy transition and electrification, the emergence of such
8 compliance issues is likely to grow. Toronto Hydro must address these risks in a timely
9 manner, and without sufficient funding in this Program, this could compromise the
10 utility's ability to complete other work and lead to an increased backlog of unaddressed
11 deficiencies and their associated risk.

12

13 **4. PROGRAM COSTS**

14 In 2025, Toronto Hydro requires \$29.5 million in funding for the Corrective Maintenance
15 program, which represents an increase of \$6.4 million over the last rate application in
16 2020.

17

18 Over the 2025-2029 rate period, the utility expects the cost of this program to increase
19 by a compounded annual growth rate of 3.3 percent, which is necessary to address
20 forecast corrective work request volumes, high risk deficiencies in the P3 backlog, and
21 emerging compliance issues, and deliver the customer outcomes enabled by this
22 program.

23

24 The Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-2029) expenditures
25 are summarized in Table 3 below.

1 **Table 3: Corrective Maintenance Program Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Corrective Maintenance	23.1	26.5	23.5	24.9	25.6	29.5	30.7	31.0	32.0	33.6
Total	23.1	26.5	23.5	24.9	25.6	29.5	30.7	31.0	32.0	33.6

2

3 **4.1 Cost Drivers**

4 As discussed above, corrective maintenance needs tend to vary both in the volume and
 5 type of work required from year to year. Toronto Hydro continues to process increasing
 6 volumes of corrective work requests to address identified deficiencies. Overall, the
 7 observed variances are primarily attributable to:

- 8 • The type of work addressed each year (e.g. overhead, underground and stations);
- 9 • Gradual increase in corrective work due to greater deficiencies found via
 10 enhanced inspection forms;
- 11 • High volume of P3 backlog work that needs to be addressed to avoid issues across
 12 the system;
- 13 • Introducing new inspection programs such as cable diagnostic testing and DERs;
 14 and
- 15 • Increased volume of emergency corrective work for defective equipment.

16

17 Toronto Hydro's 2025-2029 forecast program expenditure of \$29.5 million is based on
 18 historical spending levels and work request volumes and accounts for the high-risk P3
 19 backlog of work and ESA compliance work.

1 **4.2 Cost Control and Productivity Measures**

2 Corrective maintenance expenditures are driven largely by work request volumes and the
3 types of repairs required. Toronto Hydro has taken steps to manage costs and improve
4 work processes in this Program.

- 5 • Toronto Hydro enhances the inspection forms when necessary to capture more
6 objectively quantifiable and measurable facts from field inspections. The revised
7 inspection forms provide greater visibility into asset health and allow for more
8 effective condition assessment and risk mitigation.
- 9 • Toronto Hydro also continues to emphasize “find it and fix it” practices in the
10 Preventative and Predictive Maintenance programs, which promotes the on-site
11 repair of minor deficiencies as they are identified. Examples of minor deficiencies
12 and associated corrective actions include but are not limited to, replacing
13 nomenclature, replacing faulted circuit indicators and/or installing missing guy
14 guards. This eliminates the need to create a separate work request and additional
15 travel time for a different crew to complete repair, resulting in savings of
16 approximately \$700,000 per year.
- 17 • Toronto Hydro has introduced the prioritization of the high volume of P3 backlog
18 to further determine risk level (e.g. High, Medium or Low) and classify the
19 deficiency impact (e.g. safety, environmental, reliability) which will contribute to
20 issuing work effectively based on available budget.
- 21 • The work request process has been improved in several ways in recent years,
22 including through the introduction of the Asset Deficiency Automated
23 Prioritization Tool (“ADAPT”) process in March 2021, which reduced manual
24 reviews and improved processing time. See Figure 4 below.

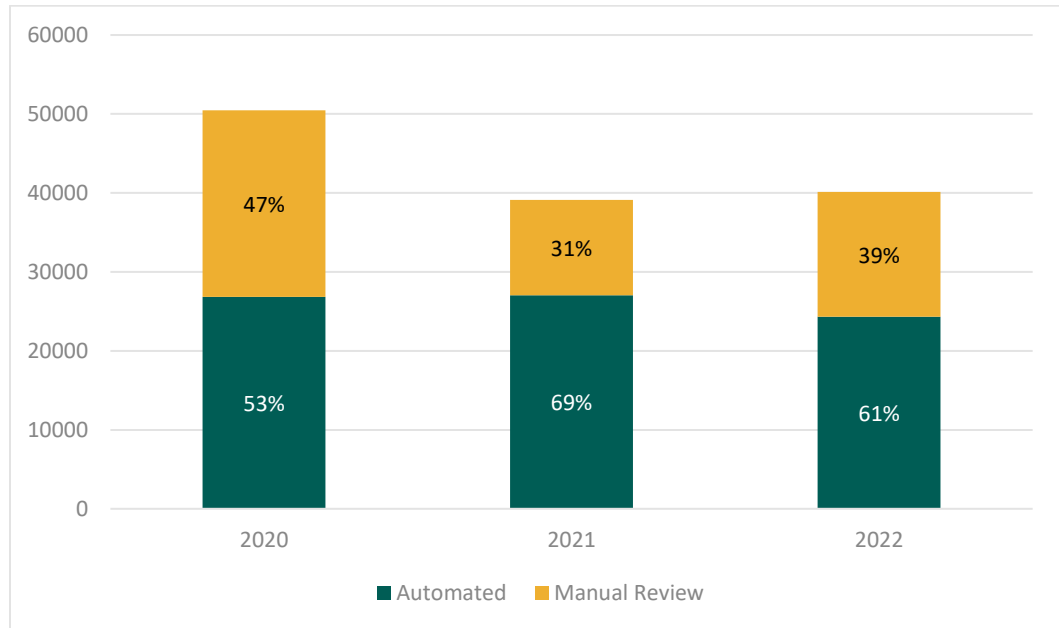


Figure 4: Manual vs. Automated Review of Work Requests

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15

- The work request process has also been improved by introducing a mass creation process for notifications submitted to the work request desk mailbox. Improved tracking and reporting by eliminating multiple, redundant Excel master lists through the adoption of the SAP system, Netezza warehouse data/table and subsequent enhancements in managing work requests. This has improved the process time of each work request as well as increasing data accuracy and traceability. The Work Request Desk (“WRD”) workflows are linked directly to Netezza data warehouse. This has resulted in a 20 percent reduction in the time taken to create a notification.
- Improved quality of submission requests via the Asset Deficiency Web Portal using standardized forms to submit work requests when deficiencies are identified. This ensures higher accuracy, completeness, and consistency when submitting requests thereby reducing the need for follow-ups.

- 1 • Better communication and coordination within Toronto Hydro (e.g. Supply Chain)
2 to ensure material availability to support effective work execution and completion
3 in compliance with the priority assigned.
- 4 • Under the Delta-Wye ESA compliance work, transformers that were scoped for
5 replacement through capital projects were automatically removed from the
6 inspection list, thus saving inspection and corrective costs.
- 7 • Lastly, deficiency and work request reviews are currently performed electronically
8 via Electronic Red Construction Folder (“eRCF”). This leads to efficient records
9 keeping, easier accessibility and better visibility of returned eRCFs from crews.

10

11 **4.3 Corrective Maintenance Program Variance Analysis**

12 2020 – 2021 Variance Explanation

13 The costs from 2020 to 2021 increased by approximately \$3.4 million due to increased
14 corrective work required to support environmental and safety risks, including station
15 decommissioning, Delta-Wye corrective work, and cap and grounding of unused primary
16 lines. The increase was also driven by a higher number of deficiencies identified through
17 inspections programs such as overhead line patrols and cable diagnostic testing.

18

19 2021 – 2022 Variance Explanation

20 The costs from 2021 to 2022 decreased by approximately \$3.0 million, primarily due to
21 the significant progress that was made in 2021 in the capping and grounding of unused
22 lines, requiring less of this work in 2022. This decrease was partially offset by increased
23 spending on work such as stations decommissioning and addressing the backlog of P3
24 work requests.

1 2022 – 2025 Variance Explanation

2 Between 2022 and 2025, costs are expected to increase by \$6.0 million, or an average of
3 \$2.0 million per year, due to:

- 4 • The need to address the P3 deficiency backlog;
- 5 • Expected increases related to spot tree trimming and corrective work for
6 Distributed Energy Resource (“DER”) sites (pilot inspections of these sites are
7 starting in 2023);
- 8 • Remediation work required for Copeland Station (Phase 1); and
- 9 • The need to replace obsolete FCIs.

10

11 2025 – 2029 Variance Explanation

12 Between 2025 and 2029, costs are forecast to increase by \$4.1 million, or an average of
13 \$1.0 million per year, to address forecast work request volumes, continue to mitigate the
14 P3 deficiency backlog, and ensure that the utility has the ability to address emerging
15 compliance issues in a timely manner without compromising other corrective work. If
16 Toronto Hydro was forced to deliver this segment with a reduced level of funding over
17 the 2025-2029 rate period, the utility could face various risks, including:

- 18 • Reduced ability to address deficiencies that pose safety risks to the public and
19 Toronto Hydro employees such as hot spots on conductor splices and/or trip
20 hazards on sidewalks due to underground assets;
- 21 • Reduced ability to address failed or corroded equipment that could negatively
22 impact the environment through oil leaks;
- 23 • Reduced ability to address deficiencies that pose risks to system reliability such as
24 deteriorated or failed components, overgrown vegetation, and/or rotting
25 crossarms;

- 1 • Increased need for capital expenditures to replace equipment that otherwise
- 2 could have been deferred through maintenance such as caulking of civil
- 3 infrastructure or installing animal guards;
- 4 • Reduced ability to address high volume of P3 backlog which may contribute to
- 5 worsening problems if left unaddressed;
- 6 • Reduced ability to mitigate outages on poorly performing feeders caused by
- 7 systemic issues, such as animal contacts at overhead transformer locations due to
- 8 lack of animal guards; and
- 9 • Reduced ability to address any emerging ESA compliance issues.

1 **EMERGENCY RESPONSE**

2

3 **1. OVERVIEW**

4 **Table 1: Emergency Response Program Summary**

Emergency Response Program Summary									
Outcomes: Customer Focus, Public Policy Responsiveness, Operational Effectiveness - Reliability and Operational Effectiveness - Safety									
Segments:									
<ul style="list-style-type: none"> Emergency Response Program 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
22.1	23.0	22.0	20.4	23.1	25.9	26.4	27.2	27.9	28.6

5

6 The Emergency Response program (the “Program”) entails the provision of emergency
 7 response and restoration services related to unplanned and urgent events affecting
 8 Toronto Hydro’s distribution system. The Program ensures that the utility is able to
 9 comply with applicable Distribution System Code (“DSC”) requirements regarding
 10 emergency response, maintain customer service and system reliability, and address
 11 urgent public safety risks.

12

13 The Program consists of three major functions:

- 14 • Dispatch Logistics;
- 15 • Grid Response; and,
- 16 • Storm and Major Event Restoration.

1 **2. OUTCOMES AND MEASURES**

2 **Table 2: Emergency Response Program Outcomes and Measures Summary**

Customer Focus	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s customer focus objectives by: <ul style="list-style-type: none"> ○ Improving communications in relation to urgent events and emergency response, including urgent planned events which customers have identified as a priority for them; and ○ Maintaining timely and accurate outage restoration time.
Public Policy Responsiveness	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s public policy responsiveness objectives by responding to police, fire and ambulance calls, where necessary, with qualified staff within 60 minutes, 80 percent of the time as prescribed by section 7.9 of the DSC.
Operational Effectiveness - Reliability	<ul style="list-style-type: none"> • Contribute to Toronto Hydro’s system reliability objectives (e.g. SAIFI, SAIDI, FESI-7) by ensuring crews are available 24/7/365 to respond to power system events and minimizing outage restoration times.
Operational Effectiveness - Safety	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s public and employee safety objectives and performance (as measured via metrics like Total Recordable Injury Frequency) by: <ul style="list-style-type: none"> ○ Ensuring timely response to failing assets and cascading asset failures, to mitigate the risk of injury to the City of Toronto’s emergency first responders, the general public and Toronto Hydro crews; and ○ Remaining compliant with Electrical Distribution Safety Regulation O. Reg. 22/04 (particularly, section 4 – safety standards) by ensuring that Toronto Hydro facilities present no undue hazard to the public).

3

4 **3. PROGRAM DESCRIPTION**

5 **3.1 Purpose and Need:**

6 The primary purpose of the Emergency Response Program is to provide 24/7 emergency
 7 response and restoration services for unplanned and urgent distribution system events.

8 The program also ensures that Toronto Hydro remains compliant with sections 4.5
 9 (Unplanned Outages and Emergency Conditions) and 7.9 (Emergency Response) of the

1 DSC while responding to and restoring services during and following these events. The
2 Program includes three main functions:

- 3 • **Dispatch Logistics:** This function involves communications intake (e.g. telephone calls,
4 email, social media, web chat, and online outage submissions) from external
5 stakeholders (e.g. customers, government authorities), information collection about
6 events on the distribution system, and field resource assignment and dispatch for the
7 purposes of investigating and resolving abnormal conditions and safety issues, and
8 other customer service related deficiencies.
- 9 • **Grid Response:** This function is executed by specialized field crews that are dispatched
10 in response to emergency situations, including compromised or failing distribution
11 assets, primary and secondary service interruptions, power quality issues, and other
12 customer service related deficiencies.
- 13 • **Storm and Major Event Restoration:** This function involves the efforts to restore
14 power after major events, extended loss of supply, and damage and safety hazards
15 arising from severe weather-related events.

16
17 Emergency response may be required for a variety of reasons, including: (i) response to
18 requests for support from Toronto Emergency Management Services (“EMS”) (i.e. police,
19 firefighters, and paramedics) or the public; (ii) equipment failure; (iii) events related to
20 severe weather; (iv) motor vehicle accidents (shown in Figure 1, below); (v) power quality
21 issues; and (vi) reactive equipment isolations.

22
23 Due to the unpredictable nature of severe weather systems and large-scale events,
24 Toronto Hydro cannot forecast the number of events requiring the mobilization of the
25 Program’s resources. However, to ensure preparedness to address events 24/7/365, the
26 Program engages: (i) specialized grid response crews working on shift around the clock

1 for immediate response, making temporary repairs, and restoring power where possible,
2 (ii) reactive and standby crews for emergency repair and re-construction, and (iii)
3 dispatchers to communicate with stakeholders, collect information, and coordinate
4 emergency responses.

5

6 The City of Toronto's dense urban environment impacts the Program's operations and
7 crew response. For example, high pedestrian and vehicle traffic can affect crew travel
8 times to emergency events, and can increase the risk to the public. In addition, due to the
9 diversity and vintage of different parts of Toronto Hydro's distribution system, grid
10 response crews have to be prepared to work with a wide variety of equipment.



11 **Figure 1: Crews were engaged to respond to a motor vehicle accident with a**
12 **Distribution Pole (2022)**

1 **3.1.1 Dispatch Logistics**

2 Dispatchers address inbound communications from internal and external stakeholders:

- 3 • External stakeholders include customers, members of the public, EMS, the City of
4 Toronto, and other utilities; and,
5 • Internal stakeholders include field crews and other staff which include Toronto Hydro
6 employees and external contractors.

7

8 Customers and other stakeholders are using increasingly diverse methods to convey
9 information to Toronto Hydro. The utility serves a large customer base with a diverse set
10 of needs and expectations that continue to evolve. Customers and other stakeholders
11 expect to be able to report a power system concern through a variety of methods and
12 receive a timely response and resolution. As a result, the utility is modernizing the
13 Program to meet these ever-evolving needs

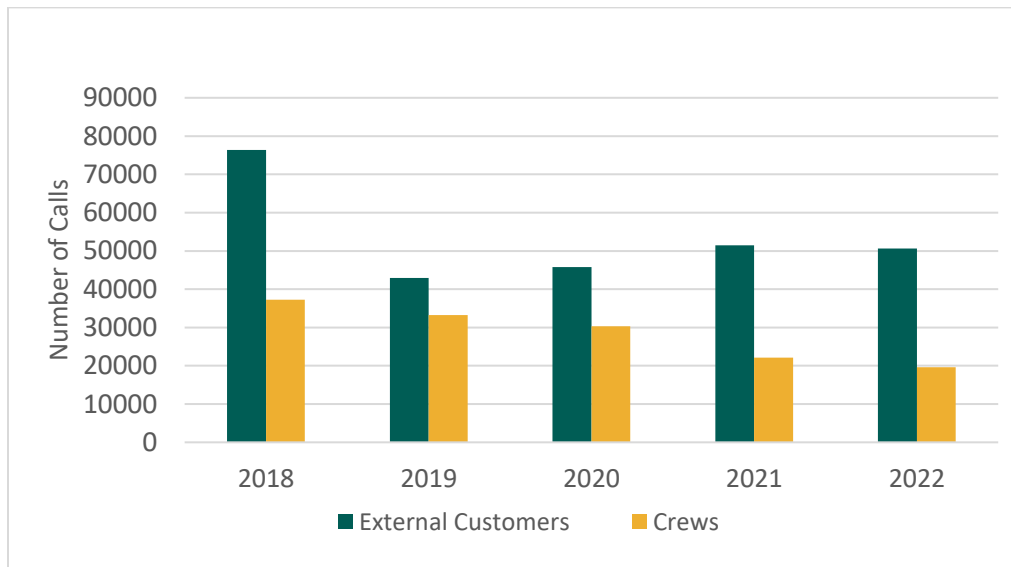
14

15 Toronto Hydro’s dispatch staff address a wide variety of inbound communications. On a
16 given shift, a dispatcher can attend to concerns reported through inbound calls, web chat
17 engagement, social media requests, and online outage reports. For each method of
18 communication, a dispatcher must interpret the nature of the event that has occurred,
19 validate the veracity of the concern (for example, confirming that the reported incident
20 is related to assets owned by Toronto Hydro or otherwise within the utility’s responsibility
21 to address), prioritize the event, confirm that it has not been already queued for response,
22 and dispatch the most appropriate resource. In addition to attending to inbound
23 communications from external stakeholders, dispatchers also engage in inbound and
24 outbound communications with field resources to respond to emergency events.

1 From 2018-2022 the dispatch logistics function received an average of 81,000 inbound
2 calls per year from external and internal stakeholders, including 54,000 external customer
3 interactions from social media, outage web chat, and online outage reporting. Although
4 customer calls typically constitute the majority of external customer interactions, social
5 media report and outage web chat volumes increased in 2021 and 2022.

6

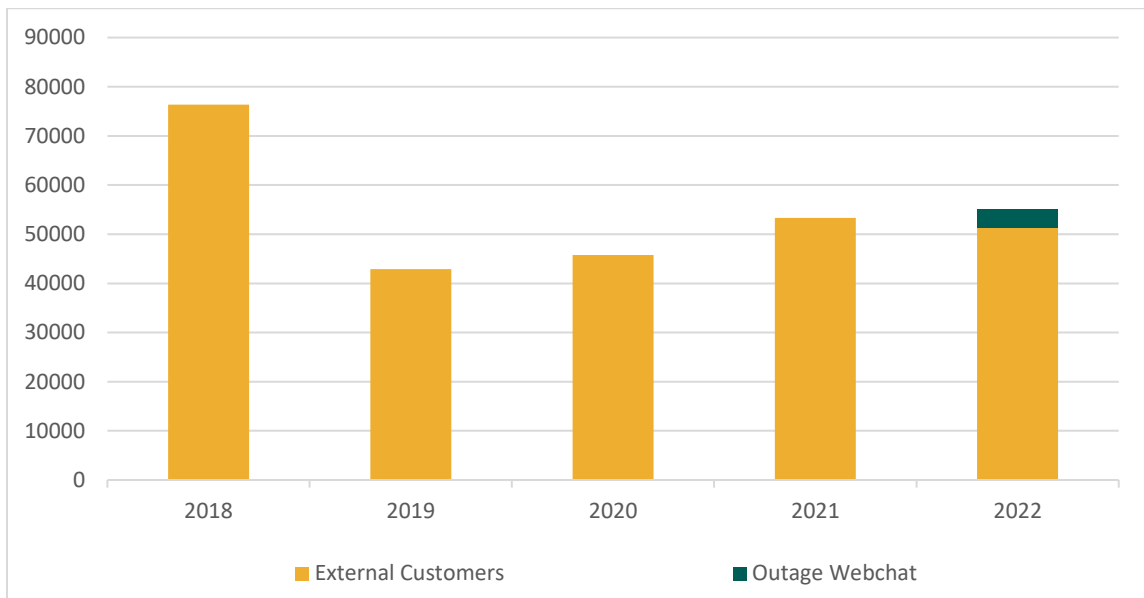
7 Call volumes in 2018 were substantially higher due to an increased volume of significant
8 events than in subsequent years. While call volumes vary depending on system
9 conditions, the volume of inbound calls from crews steadily declined year over year
10 between 2019-2022 thanks to the new system and resource monitoring tools that
11 Toronto Hydro continues to implement during the current rate period, as discussed in
12 greater detail below under Section 4.2, Cost Control and Productivity. This decline has
13 been partially offset by an increase in calls from external stakeholders during the same
14 time period (Figure 2).



15

Figure 2: Total inbound calls received by dispatch between 2018-2022.

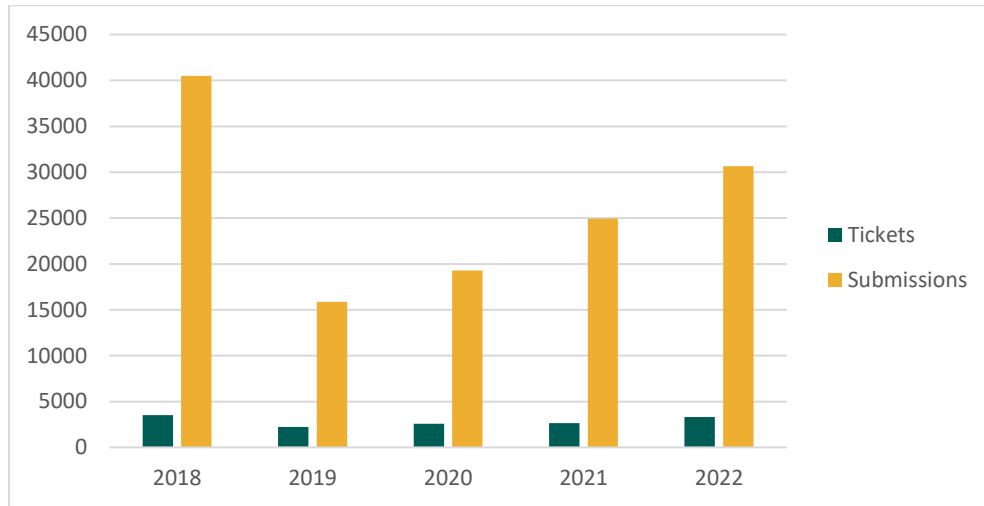
1 Toronto Hydro experienced a relatively lower volume of Major Event Days between 2019-
2 2022 compared prior years. Furthermore, during the height of the COVID-19 pandemic in
3 2020 and part of 2021, many residents worked from home, businesses were closed, and
4 public events were disrupted, resulting in decreased traffic volume in the City of Toronto.
5 Event volumes in 2020 and 2021 were lower than those in the pre-pandemic years of
6 2018 and 2019. Nonetheless, customer interactions with the dispatch logistics function
7 continued to increase from 2019 to 2022 (Figure 3).



8 **Figure 3: shows total inbound customer interactions dispatch received 2018-2022**

9
10 Customers also have the option to submit outage reports online, through Toronto Hydro's
11 website. Dispatchers validate these online outage reports using multiple tools at their
12 disposal, including communicating directly with the customer, if necessary. After
13 determining the nature of a customer's outage report, re-prioritizing or cancelling the
14 event if required, dispatch will assign appropriate resources to respond to the event. To
15 accomplish this, dispatchers gather the required information and interact with relevant
16 Toronto Hydro systems, as described in Section 3.1.2 below. Between 2018-2022, there

1 were an average of 25,000 online outage submissions and after validation was completed,
2 dispatchers submitted 2,800 unique outage tickets, for execution (Figure 4).



3 **Figure 4: Online outage report submissions and tickets created 2018-2022**

4

5 As further detailed in Section 3.1.2 below, dispatchers manage daily power system events
6 using two applications, the Outage Management System (“OMS”) function of the Network
7 Management System (“NMS”), and Oracle Field Service Cloud (“OFSC”).

8

9 **3.1.2 Grid Response**

10 Over the 2018-2022 period, approximately 20,000 events were created per year that
11 required crew dispatch. The total number of events requiring crew dispatch represents
12 approximately one quarter of the total communications intake dispatchers addressed, as
13 discussed in the previous section.

14

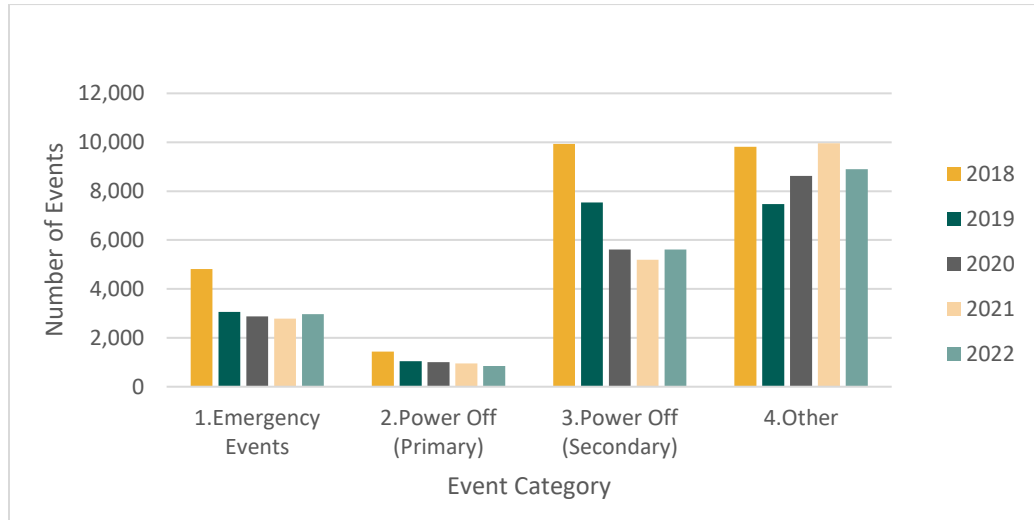
15 Toronto Hydro classifies events that require crew dispatch into four main categories:

- 16 • **Emergency Events:** Emergency calls reported by Toronto EMS or members of the
17 public may involve significant public health and safety risks. Pursuant to the
18 section 7.9 of the Distribution System Code, a crew must arrive at the location of

1 the event within one hour of being notified, 80 percent of the time. Of the
2 approximately 3,000 emergency events logged annually over the 2018-2022
3 period, over 1,100 were from Toronto EMS or validated reports by members of
4 the public.

- 5 • **Power Off (Primary):** “Power off” calls attributed to power interruptions on
6 primary facilities (i.e. on the primary high voltage side of the distribution
7 transformer). Primary “power off” events involve power disruptions to sizeable
8 loads and large numbers of customers, typically requiring coordinated switching,
9 load transfers, and often direct engagement with customer building
10 superintendents and operations staff on location.
- 11 • **Power Off (Secondary):** “Power off” calls attributed to interruptions on secondary
12 facilities (i.e. the distribution transformer or equipment on the secondary low
13 voltage side of transformer), and “power on” events where power has not been
14 interrupted but an issue has been identified on primary facilities such as voltage
15 fluctuations or flickering lights.
- 16 • **Other:** Situations such as sparking wires, objects on wires, feeder patrol findings,¹
17 and planned outages.

¹ Results of visual inspections of feeder assets that Toronto Hydro crews/contractors perform in accordance with section 4.4 of the Distribution System Code.



1 **Figure 5: shows the number of events by category during the 2018-2022 period**

2
3 Categories 1 and 2 constitute the highest priority events for dispatchers and grid response
4 resources.

5
6 Category 3 and 4 events represent the largest number of calls and typically involve power
7 interruptions to a small number of customers or lower risk situations. These events,
8 which occur daily as part of the utility's routine operations, require timely response by
9 crews that are properly equipped and trained to address repairs on high voltage
10 equipment that can pose safety risks. Due to the frequency of these events, Toronto
11 Hydro assigns dedicated crews to the grid response function, which typically involves:

- 12 • An emergency crew restoring power to all customers and making all necessary
13 permanent repairs (e.g. when current-limiting fuses have ruptured, primary or
14 secondary conductors are down, or insulators or arrestors have failed);
- 15 • An emergency crew restoring power to all customers but only making temporary
16 repairs or isolating the deficiency (necessitating follow-up repairs, usually
17 commencing the next day); or

- 1 • An emergency crew arriving on site and, after assessing the situation and making
2 the area safe for the public and employees, determining that the scope of the
3 repair is beyond that crew’s capabilities and that construction or civil crews are
4 required to fully address the situation (Figure 6).



5 **Figure 6: shows a leaning distribution pole Grid Response crews attended to and**
6 **forwarded for permanent reactive repair (2021)**

7
8 The grid response function also addresses deficiencies in equipment or components that
9 are identified in the course of planned activities and that require immediate attention.
10 For example, a subset of deficiencies found from Toronto Hydro’s Preventative and
11 Predictive Maintenance programs are directed to grid response for immediate action on
12 an emergency basis to address any unacceptable safety/public safety, environmental, or
13 system reliability risks. This process is used to create a diverse mix of work to ensure 24/7
14 crew productivity and response time to emergency events as they arise.

1 Given the nature of the events that the grid response function attends to, the vast
2 majority of its work is non-discretionary. Restoration efforts after power interruptions,
3 for example, are expected to be expedient to minimize customer outage time and
4 maintain system reliability. As previously noted, the DSC mandates timely responses to
5 EMS calls. Therefore, the utility must respond to serious equipment deficiencies to
6 mitigate potential public safety, environmental, and system reliability risks. Such
7 deficiencies may include, for example, damaged poles that could collapse and harm
8 members of the public or oil leaks from a transformer that could contaminate residential
9 or environmentally sensitive areas (Figure 7).



10 **Figure 7: shows an Overhead Transformer taken down by a falling tree, spilling oil**
11 **onto the roadway and sidewalk (2022)**

12
13 To assist with situational reporting requirements such as event clearances or estimated
14 time of restoration updates and situational awareness, the grid response and dispatch
15 logistics functions interact with the following Toronto Hydro systems: Outage
16 Management System (“OMS”), Distribution Management System (“DMS”), Oracle Field
17 Service Cloud (“OFSC”), Oracle Customer Care & Billing (i.e. Toronto Hydro’s customer

1 information system or “CIS”), Geo Electrical Mapping Records Viewer (“GEAR”), GeoTab,
2 Work Management Tool (“WMT”), Batch Request Tool (“BRT”) for meter pinging, and
3 Toronto Hydro’s enterprise resource planning system (“SAP”) for emergency
4 maintenance work order creation.

5

6 **3.1.3 Storm and Major Event Restoration**

7 The grid response function also attends to outages and public safety hazards on major or
8 significant event days,² including significant storm damage. Severe weather systems and
9 large-scale events (e.g. loss of upstream supply from Toronto Hydro’s transmitter Hydro
10 One Networks Inc.) can necessitate significant crew efforts on a number of days each year.
11 The effort is typically in response to widespread damage on the distribution system and
12 power interruptions to customers. The largest of these events are referred to as “major
13 events”.

14

15 While severe weather and significant events are inherently unpredictable, any resulting
16 increase in customer calls and system issues can produce a tangible increase in event
17 volumes year over year. Severe weather such as high wind or freezing rain can result in
18 fallen trees knocking down power lines (Figure 8), broken poles, and pole fires. During
19 the 2018-2022 period, Toronto Hydro experienced seven major event days, with five
20 occurring in the spring and summer of 2018, impacting a total of 624,000 customers.
21 There was one major event day in July 2020, with wind gusts reaching 119km/h and
22 impacting 54,000 customers. In May 2022, extreme weather resulted in a major event

² Major Event Days are defined in accordance with the IEEE 1366 Standard as: “a day in which the daily System Average Interruption Duration Index (SAIDI) exceeds a Major Event Day threshold value”. The OEB’s Electricity Reporting and Record Keeping Requirements defines a “Major Event” as an event that is beyond the control of the distributor and is a) unforeseeable, b) unpredictable, c) unpreventable, or d) unavoidable.

1 day impacting 142,000 customers. Table 3, below shows Extreme Weather events in the
 2 city of Toronto between January 2020 through March 2023.

3

4 **Table 3: Extreme Weather (January 2020 through May 2022)**

Event	Description of Impact
High Winds Storm (May 2022)	<ul style="list-style-type: none"> • 142,052 Customers impacted at its peak • 5 days to restore power to all customers
Flash Storm (August 2021)	<ul style="list-style-type: none"> • 20,000 customers impacted at peak • 2 days to restore power to impacted customers
Thunderstorm High Volume Event (July 2021)	<ul style="list-style-type: none"> • A line of thunderstorms with windspeeds in excess of 75 km/h. • 12,000 customers were impacted at its peak • Service restored for the majority of customers within 2 days
High Wind Event (April 2021)	<ul style="list-style-type: none"> • Wind expected to reach ~95km/hr • 22,000 customers impacted at its peak • 1 day to restore power to impacted customers
High Wind Event (November 2020)	<ul style="list-style-type: none"> • Winds in excess of 100 km/h • Estimated 8000 customers impacted and 101 outages at its peak
Flash Storm (July 2020)	<ul style="list-style-type: none"> • Approximately 50-70mm of rain • 50,000 customers impacted at peak • Impacted customers restored within 2 days
Adverse Weather (January 2020)	<ul style="list-style-type: none"> • Approximately 60mm of rain, 5-15mm of ice and 90 km/h winds • 4900 customers impacted at its peak • Impacted customers restored within 3 days

5

6 Since 2012, there have been a total of 21 Major Event Days in Toronto Hydro's service
 7 territory and 81 percent have resulted from inclement weather, of which 57 percent
 8 occurred between March and August.



**Figure 8: Crews respond to a fallen tree on power lines
due to a wind storm event (2021)**

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17

During a storm, shift managers and dispatchers will support the event response by coordinating all available field resources to repair the damage and restore power, scaling up resource levels as required. A shift manager will assign team members to different areas of focus. For example, some dispatchers address customer calls and some dispatchers focus on field crew communications. Assigning dispatchers to more specific tasks during storm response allows for the more effective management of increased event and call volumes.

When there is a substantial influx of outage and hazard reports in a short period, duplicate events are likely. The dispatch logistics function also heavily focuses on ensuring the information in the work agenda is accurate, removing redundant events to ensure field resources are effectively used. For very large events such as the 2013 ice storm or the May 2022 weather event that caused tremendous, widespread damage, Toronto Hydro utilizes all available internal and external resources, which are funded through the

1 Emergency Response Program. In such situations, grid response resources are
2 complemented by resources typically deployed for planned work, such as re-purposed
3 design and construction crews to address widespread damage on the distribution system
4 and power interruptions to customers.

5

6 Toronto Hydro's approach to Major Event Days and other incidents is largely driven by
7 the need to ensure that critical infrastructure and services such as EMS facilities, transit,
8 hospitals, and water pumping stations remain functional and to restore power to
9 customers as quickly as possible. This approach is also reinforced by the need to mitigate
10 risks associated with storm damage and major events to public and employee safety (e.g.
11 from hazards posed by downed conductors or damaged poles), system reliability (e.g. to
12 prevent unreasonably long durations of customer interruptions), and the environment
13 (e.g. from failed transformers leaking oil).

14

15 **4. PROGRAM COSTS**

16 In 2025 Toronto Hydro requires \$25.9 million in rate funding for Emergency Response
17 Program, which represents an increase of \$3.8 million over the last rebasing in 2020.

18

19 Over the 2025-2029 rate period, the utility expects the cost of the Program to increase
20 by annual growth rate of 2.5 percent which is necessary to address the emergency
21 response needs and deliver the customers outcomes enabled by this Program.

22

23 Table 4 provides the Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-
24 2029) expenditures for each of the Program's segments.

1 **Table 4: Emergency Response Program Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Emergency Response	22.1	23.0	22.0	20.4	23.1	25.9	26.4	27.2	27.9	28.6
Total	22.1	23.0	22.0	20.4	23.1	25.9	26.4	27.2	27.9	28.6

2

3 **4.1 Cost Drivers**

4 Year-over-year variances in historical actual costs are primarily attributable to storm
 5 events.

6 Due to the nature of the events addressed by the Program, the costs incurred are
 7 completely demand driven and can vary from year to year, with Major Event Days and
 8 smaller storms as the major cost drivers.

9

10 Toronto Hydro determines its complement of grid response and dispatch logistics staff in
 11 accordance with the utility's obligations to meet emergency response requirements on a
 12 24/7/365 basis. The utility continually monitors and optimizes complement and shift
 13 arrangements to ensure requisite resources are available to support the level of response
 14 and volume of work.

15

16 **4.2 Cost Control and Productivity**

17 **4.2.1 Dispatch Logistics**

18 Toronto Hydro's implementation of various technological solutions between 2019-2022
 19 to improve event validation by dispatchers contributed to a decrease in average event
 20 volumes over the same period, which in turn helped the utility reduce truck rolls and
 21 save on deployment costs. Dispatchers interact with a number of systems throughout a

1 given shift to assist in validating a reported concern and deciding the appropriate course
2 of action:

3
4 • Network Management System (OMS and DMS): Dispatchers log events to the OMS
5 work agenda. In addition, dispatchers can confirm whether there is an outage at a
6 customer's smart meter using NMS' Advanced Metering Infrastructure ("AMI")
7 functionality. During emergencies, dispatchers use NMS to support damage
8 assessment and wire guarding activities, as the system provides a view of all devices
9 and asset types in the field from a single screen, facilitating the accurate
10 determination of the devices impacted, customer counts, and boundaries to set event
11 priority and send the event to the appropriate field resources.

12
13 • Oracle Field Service Cloud ("OFSC"): OFSC allows dispatchers the ability to view
14 pending events, traffic, and real-time crew locations on a single display. This interface
15 assists in logistical decision making, reducing crew travel time between events.
16 Incoming smart dispatching functionality will factor in crew location, traffic, estimated
17 duration, event priority, device type, and crew qualification when used for emergency
18 dispatch functionality. Toronto Hydro also expects additional cost-savings and
19 productivity improvements from the planned go-live of NMS-SAP integration in
20 summer 2023. The utility's dispatchers currently create 20,000 emergency
21 maintenance work orders per year. SAP integration will allow dispatchers to create
22 an emergency maintenance work order directly from the NMS work agenda. This
23 process improvement will streamline the day-to-day work order creation process for
24 field crews to charge costs against when completing system events, resulting in
25 considerable time savings annually and presenting an opportunity for dispatchers to
26 take on additional duties during their shifts. In addition, OFSC provides a chat feature

1 where dispatchers and field staff can communicate electronically, which has the
2 potential to mitigate phone queue wait times in high-volume scenarios and
3 communicate important safety messaging to all electronic crews without the need for
4 a phone interaction. Toronto Hydro expects to leverage future phases of OFSC to
5 introduce a more automated, productive platform that can assign events to the most
6 appropriate qualified resources.

7

8 • Batch Request Tool (“BRT”): Dispatchers use the BRT to confirm if there is voltage to
9 a customer’s meter using AMI functionality. All initial outage reports are validated
10 with the use of BRT, allowing dispatchers to assign confirmed outages to crews in the
11 field. If a customer is shown to have full power after pinging their meter, dispatchers
12 correspond with the customer and reprioritize or cancel the event accordingly,
13 optimizing the use of field resources.

14

15 • Geo Electrical Mapping Records Viewer (“GEAR”): Since a significant part of work
16 under the Program involves attending to asset damage reports, such as wires down
17 situations, dispatchers use GEAR to determine asset ownership in the field and
18 confirm that Toronto Hydro is responsible for corrective or reactive actions. The
19 consistent use of the GEAR viewer saves costly truck rolls in regards to issues involving
20 non-Toronto Hydro assets such as telecommunications wires or customer-owned
21 equipment.

22

23 • Work Management Tool (“WMT”): WMT is a database of all electronic system
24 response reports, including pictures and files crews upload with their event
25 clearances. In 2021, Toronto Hydro leveraged the OFSC implementation to enhance
26 WMT to allow for enhanced documentation, photos and files to be uploaded.

1 Dispatchers use WMT to understand the historical context of a customer concern. For
2 example, if there is a recurrent issue in a particular location or repeated inquiries from
3 a customer, dispatchers are able to review previous event clearance details and
4 possibly forward the event to another work group for follow up if the issue no longer
5 falls under the Program. The enhancements allow for improved documentation when
6 follow up or research is required.

7

8 To ensure optimal resource utilization during low event volume periods, dispatchers and
9 crews attend to planned work that supports overall system health, such as planned
10 customer isolations, inspections, and maintenance tasks.

11

12 Toronto Hydro dispatchers work on a shift schedule that the utility has optimized based
13 on current staffing levels and to enable compliance with applicable legislative and
14 regulatory requirements, as well as providing timely response to internal and external
15 stakeholder concerns. In the event of a sudden influx of call and event volumes, a 24/7
16 standby complement is available to scale up and manage higher call and event volumes.
17 This scalability allows dispatch logistics to generally handle a significant event in an end-
18 to-end manner before having to engage the Disaster Preparedness Management program
19 under Exhibit 4, Tab 2, Schedule 6.

20

21 **4.2.2 Grid Response**

22 Predicting the number and timing of system events, and the severity and frequency of
23 adverse weather with a high level of accuracy is generally not practical. However,
24 Toronto Hydro's capital investments through the System Renewal programs help
25 mitigate the risk of asset failure by renewing assets in poor condition and improving

1 overall asset performance.³ In addition, the utility's continuous improvement in
2 engineering and the work of its standards committees, as well as preventative and
3 predictive maintenance programs (including vegetation management and storm
4 hardening) all contribute to the resilience of the distribution system.⁴ Collectively,
5 these efforts are expected to improve the overall resiliency of the distribution system
6 and help alleviate cost pressures in the Program over the long term.

7

8 Toronto Hydro goes through a competitive bid process to tender out the operations in
9 grid response function and ensure that costs for these services are in line with market
10 rates. The nature of the services requires highly trained and experienced field workers
11 who can efficiently and safely troubleshoot distribution system problems, identify the
12 necessary repairs and execute the work under all weather conditions while working
13 under pressure. Currently, work is split between two independent service providers.
14 Each provider has crews working 24 hours, 7 days a week. To account for the ever-
15 changing needs of Toronto Hydro's distribution system, the grid response function
16 continues to assess and review the shift complements on an ongoing basis and adjusts
17 schedules accordingly to balance performance with costs. Crews are also cross-trained
18 and set up in a way to enable the combination of two trouble crews to complete
19 reactive work as required and avoid the need to call in a standby construction crew on
20 overtime, resulting in reduced costs.

21

22 When event volumes are relatively low, the grid response function assigns less urgent
23 maintenance work under the Corrective Maintenance and Preventative and Predictive
24 Maintenance programs to maximize labour utilization and improve system reliability.⁵

³ Exhibit 2B, Section E6.

⁴ Exhibit 4, Tab 2, Schedules 1-4.

⁵ *Ibid.*

1 In addition, through the use of the systems discussed under Section 4.2.1, Toronto
2 Hydro assesses and monitors the number of crews on shift throughout each day of the
3 week to optimize available resources. For example, the utility staggers crew start and
4 stop times and prioritizes events to increase the number of events responded to per
5 crew shift.

6

7 **4.3 Emergency Response Program Year-over Year Variance Analysis**

8 2020 – 2021 Variance Explanation

9 Between 2020 and 2021 there was an increase of \$0.9 million due to multiple high wind
10 storm events over the months of March, May, August, October, and December.

11

12 2021 – 2022 Variance Explanation

13 Between 2021 and 2022 there was a decrease of \$1 million. Compared to the previous
14 year, 2022 had less severe and milder storm event days, with the exception of the May
15 storm which resulted in a Major Event Day (“MED”).

16

17 2022-2025 Variance Explanation

18 Between 2022 and 2025, costs in this segment are expected to increase by \$3.9 million,
19 or an average of \$1.3 million per year due the increased cost of providing emergency
20 services as a result of inflationary cost pressures including increased labour and vehicle
21 costs. In addition, a new contract for external resources will become effective in 2025.

22

23 2025-2029 Variance Explanation

24 Between 2025 and 2029 costs in this segment are expected to increase by \$2.7 million,
25 or an average of \$0.7 million per year, to maintain the resourcing capacity and
26 capabilities required to support the volume and complexity of work discussed above. If

1 Toronto Hydro were forced to deliver this segment with a reduced level of funding over
2 the 2025-2029 rate period, the utility could face various legal compliance risks and
3 drawbacks, including:

- 4 • Potential non-compliance with the Distribution System Code service quality
5 requirement for emergency response,
- 6 • Delayed responses to safety and environmental risks, which would increase
7 customer and crew exposure to unsafe conditions and the potential for fines or
8 penalties by federal, provincial and municipal regulatory bodies for failure to
9 report and or mitigate environmental spills in a timely manner,
- 10 • Extended customer outage durations,
- 11 • More frequent and longer outage durations, adversely affecting the health of
12 distribution assets and increasing the likelihood of more prolonged outages, and
13 • Delayed responses to urgent customer and stakeholder concerns.

1 **DISASTER PREPAREDNESS MANAGEMENT**

2

3 **1. SUMMARY**

4 **Table 1: Disaster Preparedness Management Summary**

Disaster Preparedness Management Program									
Outcomes: Customer Focus, Operational Effectiveness - Reliability, Operational Effectiveness - Safety, Operational Optimization									
Segments:									
<ul style="list-style-type: none"> Disaster Preparedness Management 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
6.0	5.5	4.9	1.3	1.8	1.9	1.9	2.0	2.1	2.2

5

6 The Disaster Preparedness Management program (the “Program”) entails the
 7 implementation of a robust and comprehensive disaster preparedness framework for
 8 Toronto Hydro. The Program is comprised of activities to prepare for, respond to, and
 9 recover from disasters or large-scale emergencies (e.g. severe storms, major
 10 system/facility disruptions) at both the distribution system and corporate levels. It
 11 delivers the requisite governance, planning, and training that enables Toronto Hydro to
 12 mobilize and deploy its resources rapidly and effectively during and following disasters in
 13 order to mitigate the public safety, reliability, and financial risks that can materialize at
 14 such critical times. The Program also uses those same methodologies to prepare an
 15 effective response to internal disruptions of normal operations by identifying critical work
 16 and prioritizing the necessary supporting resources such as workspace, equipment,
 17 technology, people, etc.

18

19 As the largest city in Canada, Toronto is home to over 3 million people and 190,000 active
 20 businesses including the country’s largest financial institutions, leading medical and

1 research facilities, educational institutions, major transportation hubs, and federal,
2 provincial and municipal government offices.¹ In addition, the City frequently hosts
3 events of regional, national, and international significance. Extended power disruptions
4 within Toronto Hydro’s service territory can have significant impacts on these important
5 organizations and events, causing far-reaching social and economic consequences. In
6 addition, with the energy transition leading to increased electrification—including the
7 electrification of heating and transportation—as well as the widespread adoption of work
8 from home and hybrid working models, it will be even more important for residents and
9 businesses to have consistent and reliable access to electricity.

10

11 Accordingly, it is essential that Toronto Hydro respond quickly and effectively to minimize
12 disaster-related power disruptions. The urgency of this need is further heightened given
13 the growing likelihood and intensity of extreme weather events and deliberate threats
14 (e.g., cyber-attacks).

15

16 This Program is a continuation of the activities described in the Disaster Preparedness
17 Management Program from Toronto Hydro’s 2020-2024 Rate Application.² The Program
18 is necessary to ensure the continued implementation of a comprehensive and industry-
19 leading disaster readiness program that satisfies customer expectations, maintains
20 adequate service levels, ensures public and employee safety during and following
21 disasters, and enables the utility to comply with applicable legislative and regulatory
22 requirements.

¹ City of Toronto, *Toronto Economic Dashboard, Labour Demographics*, online: <<https://www.toronto.ca/city-government/data-research-maps/toronto-economy-labour-force-demographics/toronto-economic-dashboard/>>.

² EB-2018-0165, Exhibit 4A, Tab 2, Schedule 6.

1 **2. OUTCOMES AND MEASURES**

2 **Table 2: Program Outcomes and Measures Summary**

<p>Customer Focus</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s customer focus objectives by: <ul style="list-style-type: none"> ○ Establishing and communicating accurate estimated outage restoration times for disaster incidents; ○ Coordinating effectively with impacted customers, particularly those identified as key customers; and ○ Restoring customers efficiently and effectively, using all available internal and external resources (e.g. through the utilization of mutual aid assistance as necessary).
<p>Operational Effectiveness - Reliability</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s system reliability objectives (ex. SAIDI, SAIFI, FESI-7) by: <ul style="list-style-type: none"> ○ Responding efficiently (including through the effective utilization of available resources) to major disruptions; ○ Reducing response times by conducting regular assessments to understand the utility’s exposure to hazards and align preparatory activities based on expected event outcomes; ○ Maximizing and expanding potential resources for disaster response and restoration by building mutual assistance relationships with external partners; and ○ Using digital and physical damage assessment capabilities to enable more effective and informed prioritization of restoration efforts, in alignment with industry best practices. • Ensuring compliance with Section 39 of the <i>Electricity Act, 1998</i> and Chapter 5, Section 11 of the Independent Electricity System Operator (“IESO”) Market Rules that aim to alleviate the effects of an emergency on the electricity system by preparing and implementing emergency plans. • Ensures minimal impacts following an internal disruption by implementing a corporate business continuity program to assess and prioritize supporting resources for critical work process.
<p>Operational Effectiveness - Safety</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s safety objectives, measured through metrics such as the Total Recordable Injury Frequency (“TRIF”), by: <ul style="list-style-type: none"> ○ Responding to disasters in a timely manner and mitigating the public health and safety risks.

- | | |
|--|---|
| | <ul style="list-style-type: none">○ Adjusting the number of staff on duty to maintain a perimeter for safety or risk hazards following a disaster event.○ Providing clear role assignment and training with respect to disaster and emergency incident response.○ Ensuring all employees know their role and expectations, so that the appropriate actions can be taken to limit the scope and duration of an incident. |
|--|---|

1



2 **Figure 1: Damage caused by derecho wind storm in May 2022**

3

4 **3. PROGRAM DESCRIPTION**

5 Disruptions and disasters are unpredictable in timing or scope, but are virtually certain to
6 affect a distribution system as large and complex as that of Toronto Hydro. The Program
7 aims to increase the reliability of grid operations by implementing mechanisms to more
8 effectively and efficiently restore operations in response to disaster events and

1 disruptions. This is consistent with legislative and regulatory requirements regarding
 2 market participants' obligations to prepare and plan for disasters.³

3
 4 Customers also expect the utility to deliver services safely and provide accurate and
 5 timely communications of restoration times during outages. However, providing
 6 electricity distribution services to a city as large and complex as Toronto already presents
 7 a host of operational challenges even under normal operating conditions. These
 8 challenges are drastically amplified during events such as severe storms, pandemics, and
 9 critical system disruptions. Table 3 below outlines several recent examples of incidents
 10 that exceeded the utility's standard response practices and triggered the deployment of
 11 additional planning and response resources under the Program.

12
 13 **Table 3: Examples of Recent Events in the City of Toronto**

Event	Description
COVID-19 Pandemic Response (Mar 2020 – Oct 2022)	<ul style="list-style-type: none"> • A Level 2 Emergency Declaration led to the establishment of an Incident Management Team and supporting response infrastructure in March 2020. • Toronto Hydro needed to quickly pivot to remote and social distancing work for all employees when lockdowns began. • Personal protective equipment (PPE) including masks, face shields, disinfectant wipes needed to be procured, warehoused and distributed to protect working staff. • Social distancing rules prevented shared vehicle use, increasing mileage and vehicle utilization. • All employees, vendors and contractors were directly impacted by necessary measures. • Zero cases of at-work COVID-19 transmission were recorded.

³ Independent Electricity System Operator Market Rules for the Ontario Electricity Market, Chapter 5, Section 11.

Event	Description
Derecho Wind Storm (May 2022)	<ul style="list-style-type: none"> • Wind storm struck in a line from southern Ontario to Quebec City. • High winds of 120+ km/h were recorded at Pearson International Airport. • ~142,000 Toronto Hydro customers experienced an outage at peak. • 98% of customers were restored within 24 hours, 99% after 48 hours.
Mutual Aid Deployment to Ottawa (May-Jun 2022)	<ul style="list-style-type: none"> • Hydro Ottawa (“HO”) requested assistance on May 23 through the Ontario Mutual Aid Group (“OnMAG”) following the May Derecho Wind Storm. • HO experienced 110,000 customer outages. • Following the stand-down of internal response, Toronto Hydro deployed 26 employees on May 25 to aid HO’s restoration efforts. • Deployment continued until June 5.

1

2 Climate change is a significant factor influencing Toronto Hydro’s planning and
 3 operations. Scientists worldwide overwhelmingly agree that the planet is warming. ⁴ A
 4 warmer climate is expected to lead to more frequent and severe extreme weather events.
 5 Toronto Hydro also expects an increase in deliberate hazards including cyber-attacks and
 6 transnational threats to critical infrastructure Both weather incidents and deliberate
 7 hazards can rapidly escalate in scope, cross jurisdictional lines, and result in significant
 8 losses. In this regard, the risk exposure of Canadian utilities – particularly those in the
 9 country’s largest City – is a complex and urgent issue that could materialize in far-reaching
 10 social and economic consequences at the local, regional, and national levels. In this
 11 context, it is imperative for Toronto Hydro to implement a comprehensive disaster

⁴ Toronto Hydro engaged Stantec for a report titled Climate Change Vulnerability Assessment Update, which was completed on November 18, 2022.

1 preparedness framework that underpins its multi-faceted approach to planning,
2 response, operations, and recovery.

3

4 Temperatures in Toronto are expected to increase in the coming decades. For example,
5 by 2050, the average number of daily maximum temperatures of 25°C are expected to
6 occur 110 times per year compared to 86 times per year currently. A warmer climate is
7 expected to lead to more frequent and severe extreme weather events. In addition to
8 extreme weather events, Toronto experiences a wide range of weather conditions that
9 may not be classified as extreme, but nevertheless have the potential to adversely affect
10 the distribution system at various times during the year including heat, high winds, heavy
11 rainfall, and heavy snowfall. As customers come to rely more on electricity to meet their
12 energy needs, it will become even more important for Toronto Hydro to have systems in
13 place to ensure reliability and that power is restored quickly following storms.

14

15 In addition, the COVID-19 pandemic highlighted the potential impact of non-grid events
16 on Toronto Hydro's capabilities. The pandemic significantly affected normal operating
17 procedures of in-office work and close-contact working conditions in the field. A robust
18 incident management system and business impact analyses allowed Toronto Hydro to
19 efficiently pivot to a work-from-home system and social distancing measures in the field.
20 Toronto Hydro continued to reliably distribute electricity to its customers while
21 protecting the safety of its employees, contractors, and the public.⁵

⁵ An incident management system is comprehensive system for incident management that can be used to coordinate a structured incident response of any scale. The Province of Ontario provides a standard Incident Management System (IMS 2.0), which has been implemented by Toronto Hydro. Government of Ontario, *Incident Management System (IMS) Guidance Version 2.0* (March 31, 2021) online: <<https://files.ontario.ca/solgen-ims-guidance-version-2.0-en-accessible.pdf>>.

1 Overall, the Program enhances the utility’s capacity for effective planning,
2 communications, and response activity coordination in anticipation of, during, and
3 following disasters that result in significant and widespread supply interruptions and
4 threats to public safety. It does this through two complementary disciplines: emergency
5 management (“EM”) and business continuity (“BC”). Planning under the Program is
6 calibrated to reflect Toronto Hydro’s current risk profile and relevant standards and best
7 practices.⁶

8

9 The Program consists of the following three functions:

- 10 1. Hazard and Risk Profiling & Disaster Planning;
- 11 2. Program Implementation and Evaluation; and,
- 12 3. Maintenance and Improvement.

13

14 Each function is summarized below.

15

16 **3.1 Hazard/Risk Profiling & Disaster Planning**

17 Hazard or risk profiling and disaster planning is the primary and largest function of the
18 Program. This component encompasses Hazard Identification Risk Assessment, Business
19 Impact Analysis, Response Planning, and External Partnerships Management.

20

21 **3.1.1 Hazard Identification Risk Assessment (“HIRA”)**

22 HIRA entails the identification of specific hazards and risks to Toronto Hydro’s operations.
23 Through HIRA, the utility determines how frequently such hazards can materialize, the

⁶ The Program follows the Canadian Standards Association’s Z1600 Emergency and Continuity Management Program (CSAZ1600) standard. CSAZ1600 outlines requirements for emergency and continuity management programs that address disaster prevention, mitigation, preparedness, response, and recovery. Canadian Standards Association, *Emergency and continuity management program*, (2017).

1 severity of the potential impact, and which hazards pose the greatest threat to
2 distribution system operations. HIRA findings enable the utility to prepare for worst-case
3 scenarios and most likely risks, and efficiently allocate resources to hazards that may
4 occur within its service territory.

5

6 Toronto Hydro has fully operationalized a sustainable enterprise-wide HIRA framework.
7 This framework has improved the utility's understanding of its up-to-date hazard
8 exposure profile and has enabled the development of hazard risk models by correlating
9 anticipated external events (e.g. weather forecasts) to power system impacts, enhancing
10 operational decision-making. For example, thanks to this system, Toronto Hydro's ability
11 to anticipate and respond to weather events has improved during the 2020-2024 rate
12 period, through the use of dedicated forecasting tools. In addition, the implementation,
13 training, and use of incident management system procedures has allowed for a more
14 effective response architecture when emergencies or incidents occur.

15

16 **3.1.2 Business Impact Analysis ("BIA")**

17 Through BIAs, the utility predicts the consequences of a temporary loss of key business
18 functions and gathers the information needed to develop business recovery strategies.
19 BIA results show how operational disruption will impact the reliable distribution of
20 electricity and enables Toronto Hydro to identify which key services, facilities, and
21 equipment are of the highest criticality and what resources it needs to secure to ensure
22 key services can continue at acceptable levels.

23

24 In 2020, Toronto Hydro initiated an expansion into business continuity planning ("BCP"),
25 which included hiring qualified staff and securing a BCP software platform. The utility is
26 currently conducting initial BIAs for all departments, which will allow the prioritization of

1 critical processes and implementation of a standardized approach to BCP across the entire
2 organization. This will allow Toronto Hydro to monitor for gaps and plan remediation, and
3 test its capabilities in the coming years. By the end of 2024, Toronto Hydro will have a
4 full business continuity management program with BIAs completed and reviewed on
5 annual cycles, feeding to updates of BCPs and validated by testing and exercises covering
6 all aspects of Toronto Hydro. This Program will ensure Toronto Hydro has a robust
7 response infrastructure to manage internal disruptions and complement the Emergency
8 Response program discussed in Exhibit 4, Tab 2, Schedule 5.

9

10 **3.1.3 Response Planning**

11 Toronto Hydro adopts an all-hazards approach to disaster preparedness, which involves
12 the identification and integration of common disaster response elements across all
13 hazard types (e.g. severe storms, cyber-attacks, large-scale system failures, etc). The
14 utility accomplishes this through the use of the Ontario Incident Management System
15 approach to emergency management, which includes recommendations on how
16 personnel, facilities, equipment, procedures, and communications should be coordinated
17 during an incident. This approach increases planning efficiency, improves the utilization
18 of internal resources, and ensures a standardized and efficient response if and when the
19 utility must react rapidly. It also streamlines processes and improves the utility's ability to
20 focus on unique response requirements for specific hazards and risks.

21

22 The Program produces and houses key disaster preparedness frameworks, including
23 planning documents covering corporate disaster preparedness governance, emergency
24 management, hazard-specific planning in respect of system damage and restoration
25 strategies, Toronto Hydro's role in participating in a province-wide, black-start restoration
26 of the provincial grid, planning for the management of supply chain, purchasing, and

1 material distribution during emergencies, and the utility’s approach to effectively
2 engaging with customers and external stakeholders during emergencies.

3

4 In addition, public authorities and organizations hosting events or responding to
5 situations in the city frequently approach Toronto Hydro to provide assurance in the form
6 of contingency plans for specific events (e.g. the 2019 Toronto Raptors victory parade,
7 support for mass vaccination clinics in 2021-2022, “trucker protests” blockading
8 downtown areas in February 2022) that bring together thousands of attendees. Each of
9 these events and situations is unique in nature, requiring custom response plans that are
10 tailored in scope and approach relative to the existing grid emergency plans.

11

12 **3.1.4 External Partnerships**

13 The utility collaborates closely with electricity sector partners (e.g. Ontario Power
14 Generation, Hydro One Networks Inc., the Independent Electricity System Operator,
15 Electricity Canada) to ensure consistent response and collaborative restoration.

16

17 Toronto Hydro is an active participant in the working groups of the departments,
18 agencies, and corporations (“DACs”) of the City of Toronto, contributing to both the
19 Extreme Winter Weather Working Group and the Extreme Heat Emergencies Working
20 Group. This work highlights the foundational nature of the utility’s line of business, and
21 how critical its resiliency is to the social and infrastructure work the other DACs conduct,
22 as without power they cannot effectively operate.

23

24 In addition, through mutual assistance (“MA”) agreements with other utilities, Toronto
25 Hydro has access to “at cost” crews, equipment, supplies, or expertise following a
26 disaster. Toronto Hydro is an active member of the North Atlantic Mutual Assistance

1 Group and a founding member of the Ontario Mutual Assistance Group, which enables
2 the utility to leverage assistance from a number of neighbouring jurisdictions when the
3 need arises.



4 **Figure 4: Repair Work by Toronto Hydro Crews Deployed to Hydro Ottawa Territory**
5 **(May 2022)**

6

7 The Program includes planning for the deployment and onboarding of MA crews. MA can
8 give rise to operational challenges and requires significant planning and coordination to
9 be leveraged safely and efficiently. To ensure the safety of external crews assisting
10 Toronto Hydro during disasters, the utility needs to undertake significant research,
11 negotiation, and planning to implement the necessary MA arrangements and derive the
12 maximum benefits of such arrangements. Jurisdiction-specific legislative and regulatory
13 regimes, along with different operating standards and system configurations, can limit
14 the host utility's ability to take full advantage of MA within a short timeframe. While the

1 adoption of the common Utility Worker Protection Code has simplified some matters,
2 operational complications associated with differences in safety practices, construction
3 standards and restoration practices and lack of familiarity with the requesting utility's
4 system may result in MA crews being assigned simpler, non-critical tasks, which ultimately
5 leads to longer restoration timelines and prevents the full utilization of highly qualified
6 resources. Furthermore, the difficulties encountered in the deployment of mutual aid
7 resources can lead to an increase in overall restoration costs without proper advance
8 planning and coordination. During the 2025-2029 plan period, the utility will update and
9 expand on its plan for sourcing, onboarding, and utilizing non-Toronto Hydro crews
10 following a potential disaster event.

11

12 **3.2 Program Implementation and Evaluation**

13 This Program function entails the delivery of required workforce training and the
14 execution of approved plans and processes during a disaster incident. The Program
15 provides employees with training on updated disaster preparedness frameworks and
16 processes, emergency roles, and incident management. It also integrates emergency
17 response and preparedness requirements into corporate IT systems. This shows Toronto
18 Hydro's commitment to plan ahead and ensure resiliency is integrated into core processes
19 and systems.

20

21 The Program evaluates ongoing disaster planning and procedures through testing,
22 exercises, and reviews of actual events (e.g. through after-action reviews and Major Event
23 Day reporting). Toronto Hydro conducted an after-action review after an incident to
24 gather the lessons learned from direct experience and enable their incorporation into
25 business practices. Relevant incident commander(s) then draft and signed off on an after-
26 action report ("AAR") and present it to the Disaster Planning Forum ("DPF") at the next

1 opportunity.⁷ Smaller scale actions resulting from the AARs are implemented without
2 delay. For large scale actions, recommendations are made to the DPF members to
3 determine if large-scale changes to corporate practices are necessary.

4

5 In addition, using simulation techniques (e.g. drills, system tests, etc.), the utility is able
6 to identify gaps in its disaster planning including with respect to training, internal and
7 external coordination, communications, and resource availability. For example, since
8 2020 Toronto Hydro has:

- 9 • Participated in a continent-wide industry response validation (GridEx VI 2021);⁸
- 10 • Conducted 3 rounds of incident management software (Disaster LAN) exercises to
11 practice and validate knowledge of the tool across the corporation;
- 12 • Used Disaster LAN to manage roll-out of Utility Work Protection Code in 2021/22
13 across Toronto Hydro; and
- 14 • Validated and tested the incident management system processes and capabilities
15 in numerous potential and actual disruptions.

16

17 During the 2025-2029 rate period, Toronto Hydro expects to build and enhance a
18 comprehensive exercise and testing program for disaster preparedness. It will continue
19 to design and conduct disaster simulations and tests that identify program gaps with a
20 view to informing adjustments and improvements in the overall disaster planning
21 framework and supporting plans and procedures.

⁷ The Disaster Planning Forum is a forum for leadership from across Toronto Hydro to review and provide feedback on the utility's Disaster Preparedness Program.

⁸ This is a voluntary continent-wide exercise is focused on cyber- and infrastructure-attacks on critical grid components, and participants' capabilities to respond and cooperate. The IESO coordinated participation among Toronto Hydro and other Ontario participants. Toronto Hydro intends to participate in GridEx VII in November 2023.

1 **3.3 Program Maintenance & Improvement**

2 This function consists of reviewing all elements of the Program including hazard and risk
3 assessment, planning, business continuity planning, and exercises and testing, in order to
4 maintain a current framework that meets the utility’s needs and risk profile. Given the
5 unique characteristics of disaster events and the need to respond efficiently and
6 effectively in each case, dedicated resources and processes are required in order to
7 research, identify, evaluate, and implement adjustments and enhancements to existing
8 practices.

9
10 Toronto Hydro aims to maintain and improve the effectiveness of the Program on an
11 ongoing basis through the use of both internal and external reviews and assessments. For
12 the 2025-2029 rate period the utility intends to continue its systematic reviews of the
13 Program by gathering feedback from internal personnel involved in disaster response and
14 impacted stakeholders through the previously discussed AAR process.

15
16 In addition, the Program will ensure continued alignment with applicable legislative and
17 regulatory requirements and industry standards. Toronto Hydro intends to align its
18 business procedures with the tenets of the Canadian Standards Association Z1600 body
19 of guidelines, which provide best practices for emergency and continuity management.
20 Toronto Hydro currently aligns to 88 percent of Z1600 components and has a target of
21 increasing alignment to above 95 percent by the end of 2023. This is an ongoing effort
22 that will require continuous programmatic maintenance. To date, the utility has observed
23 an improvement in incident response across departments through greater familiarity with
24 the incident management system. This is a direct result of the Program’s training and
25 information sessions and efforts to promote habitual conformance to standards when
26 responding to disruptions. A strong example of the effectiveness of this work was the

1 rapid and relatively smooth response by Toronto Hydro management and operations to
2 the storm of December 22-24, 2022. The utility declared a Level 2 Emergency in advance
3 of the forecasted heavy winter weather and the incident management team was rapidly
4 rostered and deployed to manage the event, while Emergency Response and Control
5 Centre Operations ramped up operations to provide enhanced coverage.⁹

6
7 Where appropriate, Toronto Hydro uses third-party consultants to ensure that its disaster
8 planning processes are robust and effective. Accordingly, in addition to training program
9 development and facilitation, the utility requires funding to retain auditors and
10 emergency management consultants to periodically evaluate and provide
11 recommendations as the Program evolves.

12
13 **4. PROGRAM COSTS**

14 In 2025 Toronto Hydro requires \$1.9 million in rate funding for the Disaster Preparedness
15 Management Program, which represents a decrease of \$4.1 million over the last rebasing
16 in 2020.

17
18 Over the 2025-2029 rate period, the utility expects the cost of this Program to increase
19 by annual growth rate of 4.4 percent which is necessary to address the disaster and
20 disruption planning needs and deliver the customers outcomes enabled by this Program.

⁹ For more information on the latter two functions, please refer to Exhibit 4, Tab 2, Schedules 5 and 7.

1 **Table 4: Disaster Preparedness and Management Program Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Disaster Preparedness Management Program	6.0	5.5	4.9	1.3	1.8	1.9	1.9	2.0	2.1	2.2
Total	6.0	5.5	4.9	1.3	1.8	1.9	1.9	2.0	2.1	2.2

2

3 For 2020-2022, many non-routine operational and emergency expenses related to the
 4 COVID-19 response were attributed to the Program. These expenses are itemized in Table
 5 1 and include:

- 6 • Incremental facilities, vehicle and equipment signage;
- 7 • Personal protective equipment (PPE);
- 8 • Additional health services resources to support contact tracing and monitor
 9 employee quarantine, testing, etc.
- 10 • Equipment rental including trailers and vehicles to support the ongoing execution
 11 of operating and capital programs while ensuring social distancing and the safety
 12 of our employees;
- 13 • Incremental facility costs such as increased cleaning services, supplies, trailer
 14 rentals, etc.
- 15 • IT support and incremental costs related to ensuring business continuity including
 16 the transition to and working from home (e.g. conference call WebEx, support to
 17 the control room, etc.);
- 18 • Unproductive time due to employee quarantine;
- 19 • Support to the implementation of customer relief programs including the new
 20 Time of Use rates for customers during the pandemic;
- 21 • Incremental outage costs and time incurred resulting from the execution of work
 22 during a pandemic (e.g.: compensation to customers such as gift cards, etc.); and
- 23 • Costs related to the administration of vaccines to employees.

1 **Table 1: Itemized list of Corporate Costs attributed to DPM Budget**

COVID-19 response costs	2020 Actual	2021 Actual	2022 Actual
Facilities modification (physical distancing measures, cleaning, protective equipment, etc.)	2.1	2.7	3.2
Health services support (testing, contact tracing, etc.)	0.6	0.7	0.2
Business continuity and remote work enablement	0.5	0.1	0.2
Lost productivity due to employee sickness and quarantine	0.3	0.1	0.2
Time of Use (TOU) implementation costs	0.1	-	-
Miscellaneous	0.3	-	-
Total	3.9	3.6	3.8

2

3 **4.1 Cost Drivers**

4 The variances are attributable to the following factors:

- 5 • **Reduction in unplanned COVID-19 costs:** As discussed above, costs incurred by
 6 Toronto Hydro as a result of the COVID-19 pandemic were attributed to the
 7 Disaster Preparedness Management budget, resulting in the appearance of
 8 significantly higher Program costs for the years 2020-2022.
- 9 • **Increase in net payroll/labour costs and employee expenses:** These costs are
 10 associated with the recruitment, training, and development of employees who are
 11 skilled, knowledgeable, and qualified in the fields of emergency management,
 12 business continuity, and utility operations. Effective development and
 13 sustainment of the Program require dedicated employees with specialized skills
 14 and knowledge in utility operations and emergency management. Due to a period
 15 of employee turn-over the Program has been operating with reduced staffing
 16 levels throughout 2022 and 2023. The utility plans to restore staff levels, which
 17 will result in concurrent increases in payroll costs.
- 18 • **External testing and assessment costs:** Ongoing evaluation through testing and
 19 exercises provides insight into the effectiveness of the Program. The consulting

1 costs for the 2025-2029 rate period are associated with external auditing and
2 benchmarking to maintain the Program’s efficacy and continued alignment with
3 industry best practices. This portion of the budget will also be allocated for
4 conducting large scale emergency response exercises across the utility.

5
6 **4.2 Cost Control and Productivity Measures**

7 The Program aims to maintain an up-to-date and robust utility-wide disaster
8 preparedness framework while utilizing cost control and productivity initiatives to
9 manage costs. For example, Program staff proactively review administrative costs, such
10 as contracted software access, to ensure that adequate benefits are derived to justify the
11 expense.

12
13 In addition, the Program facilitates efficient use of internal resources with a view to
14 controlling external labor costs and aims to leverage existing emergency response
15 capabilities within the utility by assigning Toronto Hydro employees to emergency
16 functions. The Program trains employees on the utility’s emergency structure and the
17 emergency roles they will need to fulfill to assist with system operation and restoration.
18 Finally, in partnering with other utilities via MA agreements, Toronto Hydro has access to
19 “at cost” crews, equipment, supplies, and expertise following a disaster event. These
20 initiatives enable the utility to significantly and rapidly increase the number of resources
21 available for disaster response without an increased reliance on external resources and
22 other labor costs.

23
24 Since 2020, Toronto Hydro has continued to utilize a number of tools, processes and
25 related improvements in support of Program execution during actual events, including:

- 1 • Full utilization of the Ontario Incident Management System, which is the response
2 system used by the vast majority of responders in the Province. The adoption of
3 this system positions Toronto Hydro for collaborative response with other utilities
4 (e.g. Enbridge), public safety organizations (e.g. Toronto Police, Fire, and
5 Paramedic Services) and municipal and provincial governments. This provides the
6 utility with access to all levels of emergency management and response
7 organizations (e.g. municipal public works and forestry crews) during disaster
8 response;
- 9 • Implementation of statistical and comprehensive damage assessment tools aimed
10 at enabling more rapid and effective estimation of restoration times following a
11 disaster event. This increases Toronto Hydro’s understanding of which areas of
12 the system have been most significantly impacted and require the most
13 immediate attention, enabling the utility to plan its resource allocation more
14 effectively, focusing restoration efforts on areas requiring immediate response
15 and those which will most positively impact the greatest number of customers and
16 the impacted community; and
- 17 • Use of dedicated and deep weather forecasting feeds that provide an enhanced
18 view on potential storm events, a primary cause of disruptions to grid operations.
19 Daily updates on weather conditions and modelling predictions allow Toronto
20 Hydro to be proactive in resource planning (i.e. placing response crews on
21 standby).

1 **4.3 Disaster Preparedness Management Program Year-over-Year Variance Analysis**

2 2020 – 2021 Variance Explanation

3 Program costs decreased by \$0.5 million from 2020 to 2021 due to a reduction in COVID-
4 19 costs, namely the procurement, warehousing and distribution of PPE and other health
5 measures, and a decrease in compensation costs.

6

7 2021 – 2022 Variance Explanation

8 Program costs decreased by \$0.6 million from 2021-2022 reduction of headcount and
9 consulting costs which was partially offset by an increase in the COVID-19 response costs.

10

11 2022 – 2025 Variance Explanation

12 Between 2022 and 2025, costs in this segment are expect to decrease by \$3 million, or an
13 average of \$1 million per year due to:

- 14 • ending COVID-19 response and commensurate spend;
- 15 • This is partly offset by:
 - 16 ○ inflationary pressures; and
 - 17 ○ Increased headcount to support improving and implementing the
 - 18 functions of the Program.

19

20 2025 – 2029 Variance Explanation

21 Between 2025 and 2029 costs in this segment are expected to increase by \$0.3 million, or
22 an average of \$0.1 million per year, to maintain the resourcing capacity and capabilities
23 required to support the increased volume and complexity of work discussed above. If
24 Toronto Hydro were forced to deliver this segment with a reduced level of funding over
25 the 2025-2029 rate period, the utility could face various risks and drawbacks, including:

- 1 • Reduced disaster preparedness and response activities, potentially leading to
2 longer outage restoration times during disaster events;
- 3 • Adoption of an ad-hoc, reactive approach to disaster management (compared to
4 a modern, proactive, systematic approach that includes ongoing risk/hazard
5 assessments) that will prolong disruptions, increase emergency response costs,
6 and overall expose customers to worse reliability and customer service levels;
- 7 • Reduced ability to adequately perform drills and testing on current disaster
8 frameworks;
- 9 • Reduced ability to retain internal expertise required to continuously improve the
10 Program and bring it in line with industry best practices;
- 11 • Reduced ability to provide essential disaster preparedness training to employees;
12 and
- 13 • Potential impediment of the utility's efforts to render its distribution system more
14 responsive and resilient.

1 **CONTROL CENTRE OPERATIONS**

2

3 **1. OVERVIEW**

4 **Table 1: Control Centre Program Summary**

Control Centre Program									
Outcomes: Operational Effectiveness - Reliability, Operational Effectiveness - Safety, Customer Focus, Public Policy Responsiveness									
Segments:									
<ul style="list-style-type: none"> Control Centre Program 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
7.6	6.0	6.5	7.4	7.9	8.3	9.0	9.5	10.0	10.5

5

6 Toronto Hydro’s Control Centre Operations program (the “Program”) facilitates the safe
 7 and reliable operation of the utility’s distribution grid through real-time system control
 8 and monitoring activities on a 24/7, 365-day basis. The Program coordinates system
 9 switching and restoration work through the utility’s Control Centre to mitigate the effects
 10 of outages on customers and to enable safe load transfers for capital and maintenance
 11 work. The Program further leverages the Control Centre to monitor the flow of electricity
 12 and asset performance across Toronto Hydro’s distribution system to provide real-time
 13 information and system condition data for future use in system planning activities. The
 14 Control Centre plays a critical role in enabling and supporting the growth of the utility’s
 15 distribution system and ensuring that core operational services continue to be delivered
 16 in an efficient and reliable manner. The Program includes the following functions:

- 17 • **Distribution System Operations:** Real-time, 24/7 operation of the distribution
 18 grid to monitor system conditions, respond to outages, enable field crews to safely
 19 work on the distribution system, and coordinate operations with third parties such

1 as Hydro One Networks Inc. (Toronto Hydro’s transmitter), and the Independent
2 Electricity System Operator (“IESO”);

- 3 • **Work and Outage Scheduling/Coordination:** Review and approval of work on the
4 distribution system and scheduling system outages or work to minimize system
5 and customer impact;
- 6 • **Grid Analytics:** Reliability reporting and grid analysis to monitor risks,
7 performance, and project design of approved construction;
- 8 • **Supervisory Control and Data Acquisition (“SCADA”) System Maintenance and**
9 **Support:** Maintenance, configuration and troubleshooting of the utility’s SCADA
10 system, which enables power system controllers to monitor and operate
11 distribution system equipment remotely and in real time; and
- 12 • **Energy Centre:** The operation of Toronto Hydro-owned energy storage systems
13 and the monitoring of grid impacts from customer-owned distributed energy
14 resources.

15

16 The Program is a continuation of the activities described in the Control Centre Operations
17 program in Toronto Hydro’s 2020-2024 Rate Application.¹ The utility expects the size and
18 scope of the Program to evolve as the nature and needs of distribution system users (such
19 as load, electricity generation, and storage customers) change in accordance with broader
20 industry preferences and trends as part of the energy transition. Toronto Hydro
21 accordingly plans to increase the workforce capacity of the Program to modernize its
22 Control Centre functions during the 2025-2029 rate period.

¹ EB-2018-0165, Exhibit 4A, Tab 2, Schedule 7.

1 **2. OUTCOMES AND MEASURES**

2 **Table 2: Control Centre Operations Program Outcomes and Measures Summary**

<p>Operational Effectiveness - Reliability</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s system reliability objectives (e.g. SAIDI, SAIFI, FESI-7) by: <ul style="list-style-type: none"> ○ Responding to system disruptions on a 24/7/365 basis and, in conjunction with field crews, taking the necessary actions to restore service in a safe and expedient manner; ○ Supporting and enabling the successful execution of the distribution system’s capital and maintenance investment programs; ○ Maintaining the integrity of the registry database that pertains to system asset quantity and type, which is used for planned and reactive distribution system work; and ○ Ensuring compliance with all legislative and regulatory requirements related to grid emergency preparedness and business continuity, including emergency preparedness requirements outlined in Section 39 of the <i>Electricity Act, 1998</i> and IESO’s Market Rules relating to emergency preparedness planning and system restoration planning.
<p>Operational Effectiveness - Safety</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s safety objectives measured through metrics such as the Total Recordable Injury Frequency (“TRIF”) by: <ul style="list-style-type: none"> ○ Providing seamless visibility over the distribution system, including load management and control over inadvertent energizing of equipment; ○ Administers application of the Utility Work Protection Code, which is a critical tool for eliminating electrical hazards for working on distribution plant; and ○ Ensuring compliance with electrical distribution safety regulations through timely reporting of serious electrical incidents involving Toronto Hydro infrastructure.

Customer Focus	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s customer focus objectives by: <ul style="list-style-type: none"> ○ Receiving and responding expeditiously to trouble calls from customers and/or external stakeholders; ○ Maintaining the capability to effectively manage, prioritize and resolve multiple concurrent system issues impacting customers; and ○ Providing relevant and timely outage information for customers, such as estimated outage restoration times and other situational information relating to system outages.
Public Policy Responsiveness	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s public policy objectives by ensuring compliance with: <ul style="list-style-type: none"> ○ Emergency response-related service quality requirements of the Distribution System Code (“DSC”) by ensuring the utility responds to emergency calls within sixty minutes, 80 percent of the time;² ○ DSC requirements governing the connection and integration of distributed energy resources to the distribution system through the development and implementation of necessary tools and processes; and ○ Electricity Reporting and Record Keeping Requirements relating to Major Event Day reporting by efficiently communicating with external and internal parties, prioritizing system alarms, external and internal reports, and dispatching resources effectively.

1

2 **3. PROGRAM DESCRIPTION**

3 **3.1 Control Centre Functions**

4 3.1.1 Distribution System Operations

5 The Control Centre is responsible for the safe and efficient operation of the distribution
 6 system. This includes monitoring the status and operational state of the distribution
 7 system on a 24/7/365 basis. Power system controllers maintain a real-time model and

² *Distribution System Code (August 2, 2023).*

1 record of switch positions, device states, power flows, loading, work-in-progress, trouble
2 alarms and abnormal system events across all 1,700+ circuits.

3

4 To support these functions, power system controllers utilize a wide range of processes
5 and specialized tools, such as directly opening and closing remotely operable switches to
6 redirect the flow of electricity, instructing field crews with respect to the operation of
7 locally operable switches, and administering the Utility Work Protection Code (“UWPC”)
8 to ensure that work on, or in proximity to, Toronto Hydro’s infrastructure can be
9 conducted safely. Power system controllers are responsible for identifying the necessary
10 steps to safely complete the work and minimize interruptions to customers, instructing
11 field crews regarding the execution of these steps, and maintaining records of which steps
12 have been completed and which workers are actively working on the system.

13

14 Between 2018 and 2020, UWPC was implemented across Toronto Hydro. UWPC
15 implementation was a company-wide strategic initiative led by the Control Centre team
16 to adopt the provincial standard work protection code. It involved process development,
17 modifications to core operating platforms, and the training of all power system
18 controllers and electrical field workers. Previously, Toronto Hydro utilized its own unique
19 work protection code. The purpose of this initiative was to align Toronto Hydro’s practices
20 more closely with those of other Ontario utilities and with provincial Electrical Utility
21 Safety Rules. This alignment has reduced barriers to mutual aid, reduced onboarding
22 requirements for crews to work on Toronto Hydro’s distribution system, and mitigated
23 compliance risks.

24

25 Other processes administered by the Control Centre include the preparation of switching
26 sequences and the issuance of “hold-offs.” Switching sequences are documented as

1 “Order to Operate” (“OTO”) safety documents. Each OTO is comprised of a list of
2 switching instructions that enable operations crews to safely transfer customer load and
3 establish suitable work protection over a specified range of system devices. A hold-off is
4 a condition applied to a device by the controlling authority that prevents equipment
5 operations for the duration of time that a field crew is working in proximity to Toronto
6 Hydro’s infrastructure. Power system controllers record the location of workers within
7 proximity of electrical equipment (e.g. working on energized apparatus) to limit the
8 possibility that other concurrent activities may increase the risk of equipment damage.
9 Application of hold-offs for certain activities are a requirement of the Electrical Utility
10 Safety Rules and Toronto Hydro’s work procedures, and failure to apply hold-offs can
11 result in equipment damage and create extended outages should an incident occur in the
12 physical or electrical proximity to the work site.

13

14 The Control Centre also plays a significant role with respect to outage restoration. When
15 a feeder circuit breaker trips, the Control Centre is notified immediately through the
16 SCADA system. Power system controllers take immediate action to isolate the issue,
17 restore power where possible by switching to alternate supplies, coordinate with grid
18 response crews to identify the specific location of the fault, make repairs, and plan the
19 final restoration. The Control Centre will relay known situational information such as
20 outage boundaries, numbers of customers affected, and estimated restoration times to
21 the Communications and Public Affairs team for dissemination to the public.³ Similarly,
22 the Control Centre is the direct point of contact for the IESO and Hydro One in situations
23 where issues on the transmission system impact supply to Toronto Hydro’s system, or for
24 the coordination of restoration efforts following a major disruption to the provincial
25 electricity grid.

³ Exhibit 4, Tab 2, Schedule 18.

1 The Program relies on highly sensitive and secure systems that can only be accessed by
2 authorized individuals who are physically located at the designated facilities. By the end
3 of 2023, Toronto Hydro will have two fully functional Control Centre facilities upon
4 completion of the Control Operations Reinforcement Program as described in the utility's
5 2020-2024 rate application.⁴ Each of these facilities is designed to be capable of
6 supporting full operations for an indefinite period of time, ensuring that the Control
7 Centre will maintain full capability even in the event that the alternate location is
8 unavailable due to unanticipated circumstances. Such circumstances could include a fire
9 in the building or in the immediate vicinity, flooding, civil unrest, extreme traffic
10 congestion, or any other situation that prevents or constrains access to a Control Centre
11 facility or otherwise impedes operations. This arrangement will also further mitigate
12 operational risk in the event of another pandemic that necessitates physical distancing or
13 restrictions on interpersonal contact. The additional Control Centre space will also
14 support the delivery of training programs and enable the maintenance of IT hardware and
15 software assets and facility systems with minimal interruption to 24/7 operations.

16

17 In the longer term, the increased Control Centre capacity will provide flexibility to the
18 future expansion of Toronto Hydro's real-time operational capabilities in scale and scope.
19 For example, such an evolution could be necessary due to a significant increase in the
20 scale of the distribution system resulting from customers' drive for electrification and
21 decarbonization, or as an outcome of potential future developments in public and
22 regulatory policies and various IESO engagements focused on market renewal and grid
23 innovation. Under the scenarios that are currently being considered, Toronto Hydro could
24 have a need to provide new real-time operational services related to energy
25 management, market operations and distributed energy resource management. The

⁴ EB-2018-0165, Exhibit 2B, Section E8.1.

1 utility does not anticipate that the implementation of the alternate Control Centre facility
2 will have a material impact on ongoing operational costs under the Program.

3

4 3.1.2 Work and Outage Coordination

5 The Control Centre acts as a central authority for the operational assessment of designs,
6 scheduling, and coordination of work on the distribution system. All construction work
7 involving modifications to the distribution system is submitted to the Control Centre for
8 review. Control Centre engineers and technicians consider the operational impacts and
9 safety of the proposed designs and provide feedback and approval. Prior to work
10 initiation, execution groups also submit work requests to the Control Centre for planning
11 and coordination purposes. This information is used to develop a plan that eliminates
12 conflicts between jobs, identifies synergies (e.g. the grouping of work requiring similar
13 isolations to reduce the number of switching activities), and allows the work execution
14 groups and the Control Centre to coordinate and optimize the use of shared field
15 switching resources.

16

17 The Control Centre is also responsible for planning service isolations and restorations at
18 the request of customers who require these services to safely work on their electrical
19 systems.

20

21 3.1.3 Grid Analytics

22 The Control Centre analyzes system performance, calculates reliability statistics, reviews
23 outage restoration performance, and plays a role in processing system record changes
24 following the completion of work in the field. In addition, Control Centre engineers and
25 technicians maintain the outage reporting and tracking system, which stores data related
26 to outages, including impacted devices/circuits, the duration of customer outages, the

1 number of customers impacted, and the restoration sequence. From this database, the
2 team compiles system performance statistics for reporting to internal and external
3 stakeholders. The group also conducts in-depth reviews of outages on a case-by-case
4 basis to assess performance and identify continuous improvement opportunities.

5

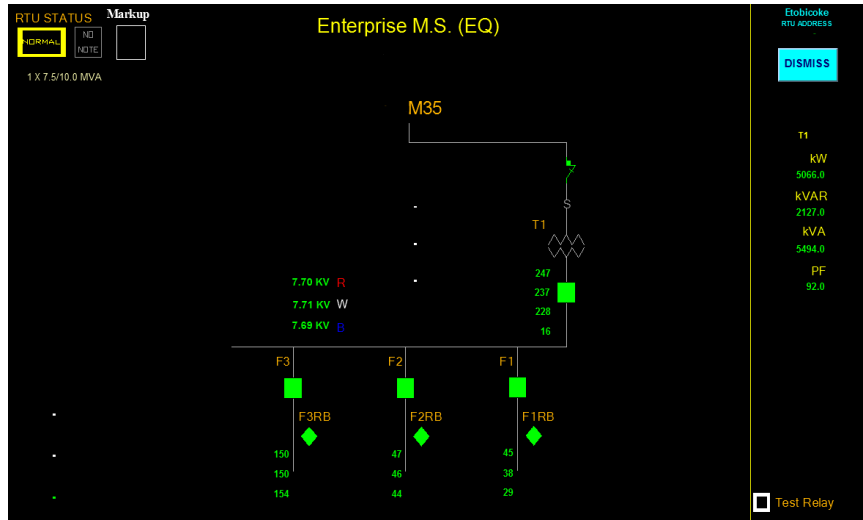
6 Toronto Hydro's distribution grid is in a state of perpetual change as new customers
7 connect to the system and capital projects make modifications to the permanent physical
8 design and configuration of the grid. The Control Centre requires access to the most
9 current information in order to effectively and safely carry out its work. Therefore, the
10 Program plays an important role in ensuring that system records are consistently and
11 expediently updated by maintaining a real time record of distribution system changes and
12 driving the change request process to permanently update record systems following
13 completion of projects. This work helps protect Toronto Hydro crews and customers from
14 exposure to unsafe conditions and ensures that switching and other Control Centre
15 activities achieve planned results without compromising system integrity and reliability.

16

17 3.1.4 SCADA System Maintenance and Support

18 As Toronto Hydro's SCADA system is integral to the efficient operation of the Control
19 Centre, a team of specialized engineers oversee the activities related to maintaining,
20 improving, and modifying it to maintain cyber security and facilitate system operation
21 efficiency. The SCADA team consists of trained engineers and technicians that possess
22 specific skill sets in SCADA and similar industrial control systems. Their efforts facilitate
23 remote system monitoring and control, and help ensure that decisions and orders from
24 the Control Centre are quickly and efficiently executed. When Toronto Hydro installs new
25 system monitoring and control equipment, it relies on SCADA engineers to configure and

- 1 enable these devices to work seamlessly with the existing equipment and applications.
- 2 Figure 1 shows the SCADA display of a typical Toronto Hydro Station.



3 **Figure 1: SCADA Display of a Typical Toronto Hydro Station**

4
5 **3.1.5 Energy Centre**

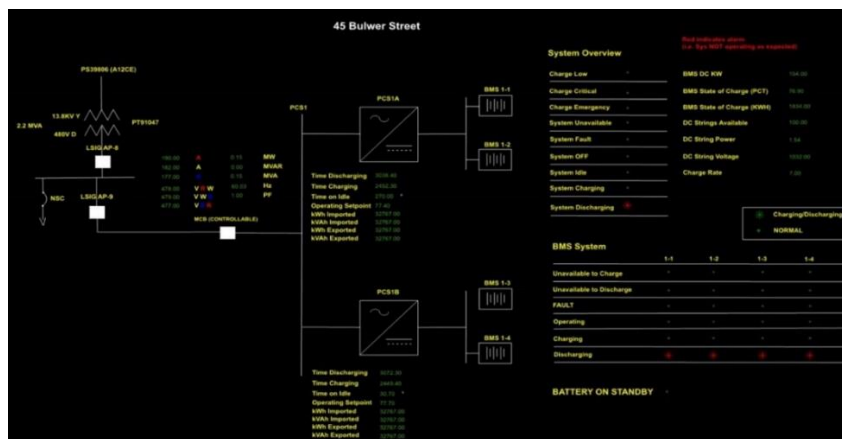
6 In recent years, Toronto Hydro has experienced an increase in the volume and scale of
7 distributed energy resources (“DERs”) connected to the grid. This trend is expected to
8 continue and will likely result in a significant increase in DER penetration over the
9 coming years as governments and private organizations adopt policies to significantly
10 reduce their greenhouse gas emissions. In addition, Toronto Hydro intends to continue
11 to pursue the development of energy storage resources, local demand response
12 programs and advanced grid pilots.⁵

13
14 A greater prevalence of distribution-connected energy sources and non-traditional
15 distribution infrastructure necessitates a shift in the way distribution systems are

⁵ Exhibit 2B, Sections E3 and E7.2.

1 operated. Rather than being geared primarily towards energy delivery, operators must
 2 also consider the importance of energy management as it relates to the safe and
 3 efficient operation of the distribution system. Historical processes and tools are not
 4 always well suited to account for this growing consideration and distribution system
 5 operators must introduce new processes and tools to ensure that future needs are met
 6 and customer expectations are fulfilled.

7
 8 Examples of emerging functions that may need to be developed and implemented at
 9 scale include energy resource dispatching, scheduling, aggregation, and settlement.
 10 Such resources may also require more active management of short circuit levels, system
 11 voltages, and advanced protection schemes. To this end, in 2019, Toronto Hydro
 12 implemented a Distributed Energy Resource Management System (“DERMS”) to
 13 enhance its capability to manage energy flows. Figure 2 below shows the DERMS system
 14 display for a battery storage site. This platform is currently used to directly operate
 15 Toronto Hydro-owned battery storage sites and to monitor and manage grid-level
 16 impacts of customer-connected DERs. As the need for these functions grows, Toronto
 17 Hydro intends to continue to develop and integrate energy management tools and
 18 processes into core Control Centre functions.



19 **Figure 2: Energy Centre Display of a Battery Storage Site**

1 **3.2 Control Centre Priorities**

2 3.2.1 Renewal, Development, and Sustainment of Skilled Resources

3 The Control Centre is primarily staffed by power system controllers, power system
4 controller apprentices and distribution grid operations managers who work on a 24/7/365
5 shift schedule. The Control Centre is also supported by a team of technical staff.

6

7 Control Centre functions require a highly trained, skilled and knowledgeable workforce.
8 The density and uniqueness of Toronto Hydro’s urban setting adds additional
9 complexities and challenges. For example, in downtown Toronto there are several unique
10 legacy distribution configurations that are generally not found at the same scale
11 elsewhere in the province, including the secondary network, underground residential
12 distribution assets, and various underground radial configurations for supplying large
13 loads. Each of these systems requires highly specialized knowledge and experience to
14 operate efficiently and safely, and to effectively respond to unplanned outages. The
15 impacts of any potential outages in these systems would be significant, which includes
16 infrastructure critical to Canada’s largest city (e.g. subways, streetcars, major hospitals,
17 emergency services facilities, community support centres, telecommunications hubs, and
18 financial institutions).

19

20 Power system controller qualifications are primarily developed through a combination of
21 in-class training and on-the-job experience. Power system controller apprentices,
22 irrespective of educational backgrounds and prior experience, are required to complete
23 a 4.5-year apprentice program, which involves the assignment of progressively more
24 complex responsibilities, to substantially familiarize themselves with Toronto Hydro’s
25 system and become fully qualified power system controllers.

1 The sustainment and development of this workforce possessing highly specialized
2 knowledge and skills is critical to ensure that Toronto Hydro has the capability to realize
3 the outcomes listed in Table 2 and to ensure that the Control Centre is well positioned to
4 embrace and overcome the challenges associated with the evolution of the nature and
5 needs of users on the utility’s distribution system and its impact on roles, responsibilities,
6 and systems. Toronto Hydro needs to continuously and proactively renew its Control
7 Centre workforce in order to offset the impacts of natural attrition. Toronto Hydro
8 mitigates these impacts with its workforce renewal program and in-house apprentice
9 development program. The Control Centre’s current staffing levels are anticipated to
10 remain generally constant; however, hiring for backfill purposes may occur 1-2 years prior
11 to anticipated retirements.

12

13 The Control Centre team also requires the support of a team of technical staff whose
14 duties include work scheduling, design review, system analysis, energy management,
15 reporting, and maintenance/development of core operating technology platforms and
16 tools (SCADA, Energy Centre, Network Management System, etc.) Over the next several
17 years, Toronto Hydro expects a significant increase in workload associated with these
18 functions to support increased distribution system automation, the development and
19 sustainment of energy management functions, distribution system growth (load and
20 connection volumes), and the expansion of the SCADA system to enable more remote
21 and autonomous operational capabilities.

22

23 For example, as shown in Table 3 below, the number of assets connected to Toronto
24 Hydro’s SCADA system is going to increase significantly—by approximately tenfold in

1 some cases—over the 2025-2029 rate period as part of the investments under the
2 Contingency Enhancement segment of the System Enhancements program.⁶

3

4 **Table 3: Increase in Number/Volumes of SCADA-connected Assets across 2020-2024**
5 **and 2025-2029 rate periods**

Asset Type	2020-2024	2025-2029
Switches	33	299
Reclosers	49	220
Feeders to Meet Minimum Requirement for Distribution Automation (DA)	15	63

6

7 Similarly, growth in the volume of DERs driven by both Toronto Hydro and its customers
8 more broadly will increase the workload of the Program. By 2029, the expansion of the
9 Non-Wires Solutions program will require the Energy Centre function of the Program to
10 support the procurement of up to 30 MW of capacity under the Flexibility Services
11 initiative (compared to 10 MW in the 2020-2024 period) and manage the operation of
12 nine Toronto Hydro-owned battery energy storage systems (“BESS”) (compared to only
13 one in the 2020-2024 period).⁷

14

15 In addition, the utility forecasts total DERs installed on the grid to increase approximately
16 67% to 2029,⁸ which is driving investments in the Generation Protection, Monitoring and
17 Control program.⁹ Each additional device installed in the system pursuant to these
18 programs requires oversight by Control Centre personnel for: 1) commissioning and
19 testing devices in the field to reliably communicate with the SCADA system, and 2) daily

⁶ Exhibit 2B, Section E7.1.

⁷ Exhibit 2B, Section E7.2.

⁸ Exhibit 2B, Section E3.

⁹ Exhibit 2B, Section E5.5.

1 operations and troubleshooting, e.g. when responding to alarms or asset management
2 tasks. Therefore, headcount increases in this area will be essential to enabling Toronto
3 Hydro to safely and reliably accommodate these utility- and customer-driven changes to
4 its grid.

5

6 Technological advancements and the modernization of system operation tools is another
7 area that will require the Program to upskill and enhance its workforce. For example, the
8 advanced applications that Toronto Hydro will adopt as part of the Advanced Distribution
9 Management System (“ADMS”) Upgrade will require the utility to significantly improve
10 data modelling in the Network Management System (“NMS”) to enable the self-healing
11 grid and other automation functions through modernization projects such as Fault
12 Location, Isolation, and Service Restoration (“FLISR”).¹⁰ This is because the operation of
13 FLISR will depend on not only traditional types of data relating to connectivity attributes
14 of distribution equipment, but also engineering attributes, such as device limits,
15 impedances, and power transformer data, representing an increase in data point types
16 from 13 to 36. Adequate staffing for the Control Centre Operations program to gather
17 these additional types of data and input them into modelling systems will be essential for
18 the successful and timely implementation and daily operation of modernization initiatives
19 such as FLISR.

20

21 Finally, Program staff act as subject matter experts for a number of internal and external
22 activities. Internally, program staff support investments in cellular SCADA upgrades under
23 the Communication Infrastructure segment of the Information Technology and
24 Operational Technology (“IT/OT”) Systems program,¹¹ where the expertise of Control

¹⁰ Exhibit 2B, Section E8.4, Appendix A.

¹¹ Exhibit 2B, Section E8.4.

1 Centre operators is crucial to the timely and reliable completion of critical infrastructure
2 upgrades. Externally, Program staff support Toronto Hydro’s participation in industry
3 forums and working groups such as the Electric Power Research Institute (“EPRI”)
4 Distribution Operations & Planning Group and the IESO’s Transmission-Distribution
5 Coordination Working Group.¹²¹³ The operational expertise that Control Centre operators
6 bring to these engagements benefits both Toronto Hydro, by enabling the utility to
7 expand its knowledge of the industry through connections with stakeholders, and the
8 industry, by contributing to policy design and development with Toronto Hydro’s unique
9 experience as a distributor.

10

11 To collectively address these needs, Toronto Hydro forecasts a significant increase in the
12 headcount of technical staff supporting Control Centre functions between 2023 and 2029.

13

14 3.2.2 Workforce Management

15 The Toronto Hydro Control Centre operates under a 24/7 supervision model whereby
16 Control Centre managers work a rotating schedule of twelve-hour shifts. The schedule
17 ensures that at least one manager is present in the Control Centre at all times and
18 ensures effective outage response, communication with customers, and the protection
19 of public safety. As power system controllers coordinate with field crews to analyze,
20 plan, execute and resolve public safety incidents or restore power outages, accurate
21 customer-centric information must be available in a timely manner. The 24/7
22 supervision model supports consistent operational decision-making, more accurate and
23 timely dissemination of information to customers, and increased service for customer

¹² Electric Power Research Institute, *Distribution Operations and Planning* (June 8, 2023) online:
<<https://www.epri.com/portfolio/programs/108271>>.

¹³ Independent Electricity System Operator, *Transmission-Distribution Coordination Working Group* (November 17,
2023), online: <<https://www.ieso.ca/en/Sector-Participants/Engagement-Initiatives/Engagements/Transmission-Distribution-Coordination-Working-Group>> .

1 escalations. Having a manager present also provides support for more junior
 2 apprentices as they develop their skills and knowledge and helps them benefit from
 3 leadership guidance for public safety incidents and customer communication
 4 escalations. Consistent management oversight also allows operators to focus on their
 5 individual responsibilities for managing system events, while the manager monitors the
 6 overall situation, aligns priorities and strategies across the team, communicates to
 7 interested stakeholders, and activates additional resources as necessary to resolve the
 8 situation.

9

10 **4. PROGRAM COSTS**

11 In 2025 Toronto Hydro requires \$8.3 million in rate funding for the Control Centre
 12 Program, which represents an increase of \$0.7 million over the last rebasing period in
 13 2020. Over the 2025-2029 rate period, the utility expects the cost of this Program to
 14 increase by an annual growth rate of 6.0% which is necessary to address the Program
 15 needs and deliver the customers outcomes enabled by this Program. The Program’s
 16 costs are comprised almost entirely of payroll.

17

18 Table 4 provides the Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-
 19 2029) expenditures for the Program.

20

21 **Table 4: Control Centre Operations Program Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Control Centre Operations	7.6	6.0	6.5	7.4	7.9	8.3	9.0	9.5	10.0	10.5
Total	7.6	6.0	6.5	7.4	7.9	8.3	9.0	9.5	10.0	10.5

1 **4.1 Cost Drivers**

2 As noted previously, the costs of the Program are primarily driven by payroll, which is
3 partially offset by departmental labour recoveries, whereby a portion of Control Centre
4 payroll is allocated to capital projects supported by the Control Centre. Minor cost drivers
5 include temporary contract labour, which is typically used where there is a limited term
6 need for specialized expertise and knowledge (such as training), and an allocation for the
7 procurement of technical analysis and research on an as-needed basis.

8

9 **4.2 Cost Control and Productivity Measures**

10 A functional and efficient Control Centre is critical to meeting operational objectives,
11 sustaining reliability performance and enabling delivery of the capital and maintenance
12 work programs. Productivity improvements in Control Centre operations typically
13 translate to productivity opportunities for field crews, and/or enable a greater
14 throughput of work without a comparable increase in resource compliment. On an
15 ongoing basis, Toronto Hydro monitors several key areas of Control Centre performance
16 and productivity, as described below.

17

18 **4.2.1 Hold-offs**

19 Each hold-off requires a power system controller to research the work location, prepare
20 documentation, apply a condition to the circuit breaker, and verbally issue the hold-off to
21 the requestor. Toronto Hydro issues over 21,500 hold-offs each year, most of which are
22 requested between 6:30 am and 9:00 am on weekdays. In order to efficiently deliver this
23 work and minimize delays in the field, several years ago Toronto Hydro implemented a
24 planned hold-off process whereby requests are researched and prepared a day in
25 advance. This has resulted in an average transaction time of approximately 3 minutes per
26 hold-off, down from approximately 29 minutes in 2014, which allows crews to spend less

1 time waiting for hold-offs to be issued and more time on their responsibilities in the field.
2 Toronto Hydro continuously assesses and revises Control Centre processes to optimize
3 resourcing for the delivery of hold-offs and to ensure continuous improvement in
4 performance.

5

6 *4.2.2 Switching Orders*

7 Most planned distribution system work requires power system controllers to prepare and
8 check multiple switching orders, also referred to as PC17A forms. These documents
9 prescribe the steps necessary to eliminate and/or control electrical hazards in the field.
10 An individual PC17A can be anywhere from one step to over 100 steps, depending on the
11 complexity of the distribution system. In 2021, Toronto Hydro issued almost 7,500 PC17A
12 forms to field stakeholders, accounting for a total of nearly 185,000 individual switching
13 steps. In order to schedule and execute field work efficiently, field crews need to have
14 their switching documentation issued prior to the planned start of their work. Control
15 Centre managers monitor PC17A production relative to work volume and allocate
16 resources accordingly. In 2022, 80% of PC17As were issued two or more days in advance
17 of the requested work start date, helping to ensure that field crews can start their work
18 on time.

19

20 *4.2.3 Call Queuing*

21 Nearly all work on or in proximity to the distribution system requires at least one
22 transaction with the Control Centre. In 2021, the Control Centre handled over 92,000
23 individual calls. Depending on the volume of crews calling in at any given time, the Control
24 Centre is at risk of becoming a bottleneck for work execution in the field. Recognizing this,
25 in 2019 Toronto Hydro harmonized the primary mode of communication between the
26 field and the Control Centre by establishing the phone system as the primary method.

1 This ensured that all transactions are received through the same communication channel
2 and enabled the implementation of a phone queuing software which provides managers
3 and power system controllers real-time visibility of crew wait times. This insight enables
4 managers to dynamically allocate resources based on actual need, reducing wait times
5 for field crews. The phone queuing system also provides historical data with respect to
6 call volumes and wait times, enabling performance reporting and process optimization.
7 In 2021, over 94 percent of calls had a wait time of less than 10 minutes.

8

9 *4.2.4 Other Initiatives*

10 Table 5 below provides examples of other productivity initiatives under the Program.
11 Note that the future implementation of the Advanced Distribution Management System
12 (“ADMS”) project will be a prerequisite for the successful implementation of many of
13 these initiatives.¹⁴

¹⁴ *Supra* note 8.

1 **Table 5: Examples of Control Centre Productivity Initiatives**

Initiative	Timing	Outcomes and Benefits
Development of Apprentice Programs	Ongoing	Enhancement of specialized skill sets in power system controllers, which will enable efficiencies in performance. Harmonization of processes and practices across the workforce results in fewer errors and more efficient operating decisions. As apprentices progress and are qualified to take on more responsibility, it allows for more resilient shift scheduling, reducing overtime and improving day-to-day capacity of the Control Centre accommodate work without delay.
Network Management System Updates	Ongoing	Multiple times a year, the Control Centre updates the core network management system platform used by power system controllers to operate and mimic the distribution system. Changes are focused on stability, cyber security, and productivity improvements such as data validation, streamlining work flows, and automating repetitive tasks.
Supervisory Control and Data Acquisition (SCADA) System	Ongoing	The SCADA system controls approximately 4,000 field devices and is a critical operating tool for power system controllers. Power system controllers work closely with SCADA engineers to ensure that system improvements incorporate automation and streamline critical information flow to optimize outage restoration and system monitoring. Upgrades and enhancements are required for field personnel safety, improved system stability, cyber security resilience, and productivity improvements.
Automated Model Build	2023 - 2024	This initiative will provide the ability to automatically extract distribution system changes and implement them into the Network Management System (“NMS”), reducing record update latency and the amount of effort required to maintain the NMS network model.
Fault Localization, Isolation & Service Restoration (FLISR)	Ongoing	Refers to the implementation of automated fault location and system restoration following an outage. This project is intended to improve reliability and productivity by using technology to automate initial outage restoration steps and enable a self-healing grid. Work will be comprised of two major segments: the first with the Information Technology group and the second with the Control Centre’s engineering team.

Initiative	Timing	Outcomes and Benefits
Work Request Tool	2022 - 2025	Implementation of a single software tool to manage all operational work requests with integration to core systems (GEAR, ¹⁵ NMS, and SAP). ¹⁶ This project will result in the retirement of several legacy databases and platforms, and enable efficiencies in scheduling and administering distribution system work requests (work protection, planned outages, hold-offs, design review, etc.).
Operational Analytics	Ongoing	Enhances access to operational data that eliminates several manual reports and enables advanced reporting and analytics. These changes enable more efficient storm event reporting and more informative system condition reporting. In the future, it will also eliminate the need for manual outage reporting currently undertaken by power system controllers. Currently each outage requires a controller to enter outage details and restoration steps into a stand-alone outage tracking platform. In a typical year, controllers enter approximately 2,200 individual reports. The Operational Analytics program will modernize reliability calculation processes and enable auto-generation of outage reports based on restoration actions recorded in the NMS.
Digitization	2020	In 2020, partially motivated by operational constraints arising from the COVID-19 pandemic, the Control Centre completed the digitization of virtually all paper-based processes in the Control Centre. This initiative enhanced business continuity and ensured that critical operational information is readily available to all power system controllers and managers in real time.

¹⁵ GEAR refers to the Geospatially Enabled Asset Registry, a geospatial information system used by Toronto Hydro that provides a graphic representation of distribution assets and their relationship to other assets within Toronto Hydro’s network.

¹⁶ SAP is Toronto Hydro’s Enterprise Resource Management (ERP) system.

Initiative	Timing	Outcomes and Benefits
UWPC	2020	<p>UWPC implementation was a company-wide strategic initiative led by the Control Centre team to adopt the provincial standard work protection code and involved process development, modifications to core operating platforms, and the training of all power system controllers and electrical field workers. Previously, Toronto Hydro utilized its own unique work protection code. The purpose of this initiative was to align Toronto Hydro’s practices more closely with those of other Ontario utilities and with provincial Electrical Utility Safety Rules. This alignment has reduced barriers to mutual aid, reduced onboarding requirements for crews to work on Toronto Hydro’s distribution system, and mitigated compliance risks</p>

1 **4.3 Control Centre Operations Program Year-over-Year Variance Analysis**

2 2020-2021 Variance Explanation

3 Costs decreased by \$1.6 million from 2020 to 2021. This variance is attributable to:

- 4 • a higher department labour recovery rate in 2021 compared to 2020 (i.e. a higher
5 portion of labour costs were allocated to capital projects);
- 6 • higher one-time costs in 2020 directly related to the implementation of the Utility
7 Work Protection Code (“UWPC”) across the organization.¹⁷ The one-time costs of
8 \$1.1 million incurred in 2020 were primarily driven by workforce training and the
9 re-tagging of field devices pursuant to UWPC.

10
11 2021-2022 Variance Explanation

12 Costs increased by \$0.5 million from 2021 to 2022. This variance is primarily attributable
13 to higher compensation costs.

14
15 2022-2025 Variance Explanation

16 Between 2022 and 2025, costs in this segment are expected to increase by \$1.8 million,
17 or an average of \$0.6 million per year due to:

- 18 • Normal-course compensation increases; and,
- 19 • Increased headcount including additional technical and management staff to fill
20 vacant positions and support a growing volume of work related to continued
21 implementation of the intelligent grid, automation, and energy transition.

¹⁷ UWPC implementation was a company-wide strategic initiative led by the Control Centre team to adopt the provincial standard work protection code and involved process development, modifications to core operating platforms, and the training of all power system controllers and electrical field workers. Previously, Toronto Hydro utilized its own unique work protection code. The purpose of this initiative was to align Toronto Hydro’s practices more closely with those of other Ontario utilities and with provincial Electrical Utility Safety Rules. This alignment has reduced barriers to mutual aid, reduced onboarding requirements for crews to work on Toronto Hydro’s distribution system, and mitigated compliance risks.

1 Increases in headcount are necessary to support grid modernization, analytics,
2 and the development of energy centre capabilities.

3
4 2025-2029 Variance Explanation

5 Between 2025 and 2029 costs in this segment are expected to increase by \$2.2 million, or
6 an average of \$0.6 million per year, to maintain the resourcing capacity and capabilities
7 required to support the increased volume and complexity of work discussed above. If
8 Toronto Hydro were forced to deliver this segment with a reduced level of funding over
9 the 2025-2029 rate period, Toronto Hydro will be unable to resource this critical function
10 in an optimal and sustainable manner. Such a scenario would result in a number of
11 operational risks, including:

- 12 • Inability to successfully execute the capital and maintenance investment
13 programs due to Control Centre-related constraints and delays in administering
14 field work;
- 15 • Significantly longer restoration times for outages resulting from Control Centre
16 capacity constraints;
- 17 • Inability to efficiently and effectively modernize Toronto Hydro's operations to
18 meet customer and stakeholder expectations with respect to the continued
19 transition to new and diverse energy resources;
- 20 • Less effective coordination with Hydro One and the IESO with respect to bulk
21 system issues, resulting in prolonged outages for customers and possible non-
22 compliance with relevant legislative and regulatory requirements;
- 23 • Less effective dissemination of outage information to support customer
24 communications, including estimated times of restoration;
- 25 • Reduced operating efficiency and higher safety risks as a result of the reduced
26 ability to manage data on changing system configuration in a timely manner; and

- 1 • Persistence of abnormal system configurations, which can cause additional or
- 2 prolonged outages.

1 **CUSTOMER OPERATIONS**

2

3 **1. OVERVIEW**

4 **Table 1: Customer Operations Program Summary**

Customer Operations Program									
Outcomes: Customer Focus, Operational Effectiveness - Reliability, Operational Effectiveness - Safety									
Segments:									
<ul style="list-style-type: none"> • Customer Connections • Key Accounts • Public Safety and Damage Prevention • Customer Owned Equipment Services 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
9.3	7.5	9.0	12.6	12.8	12.7	13.1	13.7	14.1	14.6

5

6 The Customer Operations program (the “Program”) delivers services that respond to
 7 requests from customers. The specific activities under this Program include field work
 8 and support functions to safely, efficiently, and promptly meet customer requests. This
 9 work is categorized into four segments as follows:

10

- 11 • Customer Connections;
- 12 • Key Accounts;
- 13 • Public Safety and Damage Prevention; and
- 14 • Customer-Owned Equipment Services.

1 **2. OUTCOMES AND MEASURES**

2 **Table 2: Customer-Driven Work Program Outcomes and Measures Summary**

<p>Customer Focus</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s compliance with legislative and regulatory requirements (including Ontario Energy Board-mandated Electricity Service Quality Requirements (ESQR) measures¹) on customer connections, appointments, written responses to enquiries, and the provision of information concerning the location of the utility’s underground infrastructure, pursuant to the <i>Ontario Underground Infrastructure Notification System Act, 2012</i>². • Contributes to meeting Toronto Hydro’s customer service objectives by providing customers access to customer-owned vaults (including of one free vault access per 12-month period in accordance with the utility’s Conditions of Service). • Contributes to meeting Toronto Hydro’s obligations for customer connections (including Ontario Energy Board mandated ESQR measures) by ensuring sufficient planning staff and required tools or resources are available to efficiently plan and design service connections and meet service request volumes • The Key Accounts team ensures enquiries from large customers, developers, and key accounts are resolved appropriately and in a timely manner
<p>Operational Effectiveness - Reliability</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s reliability objectives (e.g. SAIFI, SAIDI, FESI-7) by working with customers to ensure customer-owned civil structures containing distribution equipment on customer property are adequately maintained and protected to prevent any risk of damage or interruption to parts of the distribution system.

¹ More specifically, Toronto Hydro’s customer connection-related obligations include obligations under the following sections of the DSC: Connection of New Services (7.2) Appointment Scheduling (7.3), Appointments Met (7.4), Written Response to Enquiries (7.8).

² SO 2012, c 4.

Operational Effectiveness - Safety	<ul style="list-style-type: none">• Contributes to Toronto Hydro’s public and employee safety performance and objectives (as measured via metrics like Total Recordable Injury Frequency) by:<ul style="list-style-type: none">○ Providing underground infrastructure locates in a timely manner and providing timely and accurate information to excavators, to reduce the likelihood of damage to energized underground distribution assets and consequent safety hazards to the public;○ Providing vault safety agents (VSAs) during vault access appointments to ensure customer access does not cause any safety risks and that safe limits of approach are maintained; and,○ Disconnecting and reconnecting (also known as “isolating”) customers’ service connections upon request to enable electrical work on the customer side of the demarcation point with minimal safety risk.³
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3. PROGRAM DESCRIPTION

Most of the activities in the Program are driven by legislative and regulatory requirements, including the *Electricity Act, 1998*,⁴ the Ontario Energy Board’s Distribution System Code (“DSC”), the *Ontario Underground Infrastructure Notification System Act, 2012* (“OUINSA”),⁵ the O. Reg. 213/91 (“Construction Projects”) under the *Occupational Health and Safety Act*,⁶ and other applicable requirements governing building and fire safety standards.

The Program covers the interactions between Toronto Hydro’s customers and its distribution system with a focus on the safe completion of work in proximity of Toronto

³ The costs of this program include isolations for low-voltage isolations requested by eligible low-income customers only. See section 6.1.3 of this Schedule for more information.
⁴ SO 1998, c 15, Sch A
⁵ SO 2012, c 4
⁶ RSO 1990, c O.1

1 Hydro equipment, improving the customer experience for requests for access to the grid
2 and meeting the unique needs of Toronto Hydro's largest customers. More specifically,
3 the four Program segments are:
4

- 5 • **Customer Connections:** Focuses on enhancing the experience for customers
6 requesting access to the grid by providing a dedicated team to communicate and
7 manage connection requests from initial contact through completion. This
8 segment also includes the administrative and unrecovered costs associated with
9 the investigative engineering, design, and field work to facilitate customer
10 connection requests in accordance with applicable customer service and
11 regulatory obligations. Most of the activities in the Program are driven by
12 legislative and regulatory requirements, including the *Electricity Act, 1998*, and the
13 Ontario Energy Board's Distribution System Code ("DSC");
- 14 • **Key Accounts:** Manages the utility's relationships with large electricity consumers
15 (i.e. 1MW and greater and other critical customers) across all business sectors. Key
16 Accounts collaborates across internal departments to provide an integrated
17 customer experience while building trust, meeting the unique needs of large
18 customers and delivering value;
- 19 • **Public Safety and Damage Prevention:** Which aims to provide the general public,
20 other utilities, and Toronto Hydro's capital projects crews with timely information
21 regarding the location of Toronto Hydro's underground infrastructure in
22 accordance with applicable legislative and regulatory requirements; and
- 23 • **Customer-Owned Equipment Services:** Which aims to provide customers the
24 means to safely access and service their equipment operating on the distribution
25 system, through services such as vault access and isolations.

1 **4. PROGRAM COSTS**

2 In 2025, Toronto Hydro requires \$12.7 million in rate funding for the Customer
 3 Operations program, which represents an increase of \$3.4 million over the last rate
 4 application in 2020.

5
 6 Over the 2025-2029 rate period, the utility expects the cost of this program to increase
 7 by annual growth rate of 3.4 percent which is necessary to address the program needs
 8 and deliver customers outcomes enabled by this program.

9
 10 Table 3 provides the Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-
 11 2029) expenditures for each of the Program’s segments.

12

13 **Table 3: Customer Operations Expenditures by Segment (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Customer Connections	3.7	1.6	1.6	3.2	3.6	3.2	3.3	3.5	3.6	3.8
Key Accounts	-	0.5	0.8	0.9	1.2	1.5	1.5	1.7	1.8	1.9
Public Safety & Damage Prevention	4.7	4.4	5.4	7.3	6.8	6.7	6.9	7.0	7.2	7.3
Customer-Owned Equipment Services	0.9	1.0	1.2	1.2	1.2	1.3	1.4	1.5	1.5	1.6
Total	9.3	7.5	9.0	12.6	12.8	12.7	13.1	13.7	14.1	14.6

14

15 **4.1 Cost Drivers**

16 The largest drivers of cost increases in the Program are attributable to underground
 17 infrastructure locates under the Public Safety and Damage Prevention segment.
 18 Specifically, these drivers are the proliferation of large multi-unit segment locates and the
 19 effects of the more stringent locate compliance requirements introduced by Bill 93.⁷ Both
 20 drivers are discussed in greater detail below.

⁷ Getting Ontario Connected Act, 2022, SO 2022, c 9, formerly known as Bill 93.

1 The variances in the Customer Connections segment are attributable to the complexity of
2 the initial investigation required prior to making an offer to connect. As both the number
3 and complexity of expansion projects have been increasing over time, it is expected that
4 the overall time and administrative burden involved in these investigations will also
5 increase. Projects that do not proceed are not capitalized. Any unfunded costs (including
6 administrative resources) relating to such investigation are funded through this Program.

7

8 Key Accounts was previously a function within the Customer Care segment. It was
9 separated out as a segment in 2021 to reflect the evolution of Toronto Hydro's Key
10 Accounts strategy. The variances in Key Accounts segment for the 2020 – 2024 period
11 reflect the development of this team. Costs are expected to remain relatively flat for the
12 2025-2029 period.

13

14 The variances in the Public Safety and Damages Prevention segment are attributable to a
15 significant increase in the volumes of construction and development in the city of Toronto
16 which has led to an unprecedented increase of construction projects requiring large,
17 “multi-unit segment” locates, whereas a “single unit” locate typically relates to a single
18 property or premises, multi-unit segment locates are often requested by developers
19 working on projects with large geographic footprints such as building complexes or
20 subdivisions and require the identification of underground infrastructure in a much larger
21 area or in greater numbers. Therefore, multi-unit segment locates are more complicated
22 and require more time or greater numbers of resources to complete, and therefore
23 require the utility to incur greater costs. As of 2023, the proportion of multi-segment
24 locates are almost doubled compared to April 2022.

1 In addition, in April 2022, Bill 93, *Getting Ontario Connected Act, 2022*, received royal
2 assent. This legislation resulted in major changes to the *Ontario Underground*
3 *Infrastructure Notification System Act, 2012* (“OUINSA”), which governs the mandatory
4 identification of underground infrastructure (“locates”) in Ontario. The new legislative
5 framework is significantly more onerous on utilities and other infrastructure owners due
6 to mandatory, penalty-backed, and increased compliance obligations, intended to impose
7 stricter performance standards with respect to the timeliness and accuracy of locates.
8 The legislative amendments also enhanced the powers of the Ontario One Call
9 Corporation to monitor and enforce compliance. Collectively, these developments have
10 greatly increased the demand for locate services and consequently, demand for workers
11 with the appropriate qualifications. However, it will take the construction industry time
12 and effort to ramp up service levels since low wages for personnel performing locate work
13 had historically constrained the supply of such qualified labour.⁸ As the industry raises
14 wages to attract, train, and retain more personnel, labour costs have been increasing
15 since April 2022.

16

17 Toronto Hydro expects the cost increases resulting from the above developments to
18 persist beyond 2023 as it adapts its locate service levels to achieve and sustain the
19 compliance targets and performance requirements imposed by the amended legislation
20 over the 2025-2029 rate period. Specifically, the following factors will likely continue to
21 drive increased costs:

22

- 23 • Increased operational costs to comply with the stricter compliance targets for
24 locate service providers and infrastructure owners (i.e. increased work

⁸ For example, prior to 2022 the average hourly wage for locators in Toronto was less than \$25.
<<https://www.toronto.ca/wpcontent/uploads/2023/03/8d36-2022-Utility-FW-Sched.pdf>>.

1 management processes, incremental costs for the extension of shifts, including
2 into holidays and weekends and bringing in resources from other geographical
3 areas to manage peak volumes, stricter requirements to reschedule appointments
4 in writing, which previously could be done verbally).

- 5
- 6 • Incremental costs to ensure resources are available to manage peak capacity
7 requirements and contingencies. Locate request volumes are typically seasonal,
8 in alignment with overall construction activity. However, the locate request
9 submission process administered by Ontario One Call does not require excavators
10 to submit tickets in advance, regardless of the complexity of the locate work,
11 which significantly constrains the utility's resource and work planning and
12 optimization. The new compliance requirements under OUINSA also make no
13 allowance for inclement weather, emergency situations, or force majeure, and
14 therefore the utility is required to rapidly deploy incremental capacity to handle
15 such scenarios or catch up from delays within the required timelines to ensure full
16 compliance.

- 17
- 18 • Administrative monetary penalties will be in place as of April 1, 2024. In order to
19 achieve compliance targets and mandated performance requirements under
20 OUINSA, Toronto Hydro will be obligated to meet customer driven and fluctuating
21 work demands at all times, as the utility's ability to forecast volumes is limited.
22 This will require external contractors providing locate services to maintain a
23 sufficient complement of rapid response resources.

- 24
- 25 • Increased locate request volumes due to increased awareness and compliance
26 obligations across the construction industry, including the greater incentive for

1 excavators' compliance due to penalties that Ontario One Call could levy under
2 the amended legislation.

3

- 4 • Process and system enhancements, including changes to process and technology,
5 for Toronto Hydro and its locate service providers to efficiently monitor and
6 manage increased volumes of locate work.

7

8 The cost forecasts in the Public Safety & Damage Prevention segment include increased
9 labour costs and other types of costs known at the time of filing. However, there is still a
10 great degree of uncertainty regarding the full extent of locates-driven costs that Toronto
11 Hydro may need to incur in the 2025-2029 period to achieve compliance with OUINSA.
12 For example, the Government of Ontario delayed the effective date of administrative
13 monetary penalties ("AMPs") pursuant to Ontario Regulation 87/23 under OUINSA until
14 April 1, 2024. Furthermore, through a joint letter by the Minister of Public and Business
15 Service Delivery and Minister of Energy issued on May 11, 2023, the Government of
16 Ontario signalled that it will consult on additional enhancements to locate delivery
17 requirements under the OUINSA, which may result in future legislative and regulatory
18 changes affecting demand for locate services and accompanying costs. If there are any
19 additional material developments that may affect the 2025-2029 cost forecasts for the
20 Public Safety & Damage Prevention segment while the evidentiary record is open during
21 this rate application proceeding, Toronto Hydro will adduce additional evidence as
22 required.

23

24 On October 31, 2023, the Ontario Energy Board established the Getting Ontario
25 Connected Act ("GOCA") Variance Account to allow utilities to record the incremental

1 costs of locates resulting from the implementation of Bill 93.⁹ Given the ongoing
2 uncertainty regarding the incremental costs, Toronto Hydro requests the continuation of
3 this variance account for the 2025-2029 rate period. This approach is in the best interests
4 of ratepayers, as it allows Toronto Hydro to adequately fund the locates work, which is
5 non-discretionary, in compliance with the utility's legislative and regulatory obligations
6 during the next rate term. Further details on this variance account can be found in Exhibit
7 9, Tab 1, Schedule 1.

8

9 The primary driver of cost increases under the Customer-Owned Equipment Services
10 segment over the 2025-2029 rate period is the increase in customer demand for vault
11 access services. Currently, approximately 30 percent of customers who own vaults
12 containing distribution equipment access their vaults every year. Access requests are
13 increasing due to a number of factors, including an increase in the effectiveness of the
14 Customer Action Form process (detailed under subsection 6.1.2 below) for requiring
15 customers to address deficiencies, which in turn drives repeat customer requests.
16 Moreover, the growth of the city of Toronto's buildings naturally increases the number of
17 vaults present and the subsequent requests for access.

⁹ EB-2023-0143 Decision and Order (October 31, 2023).

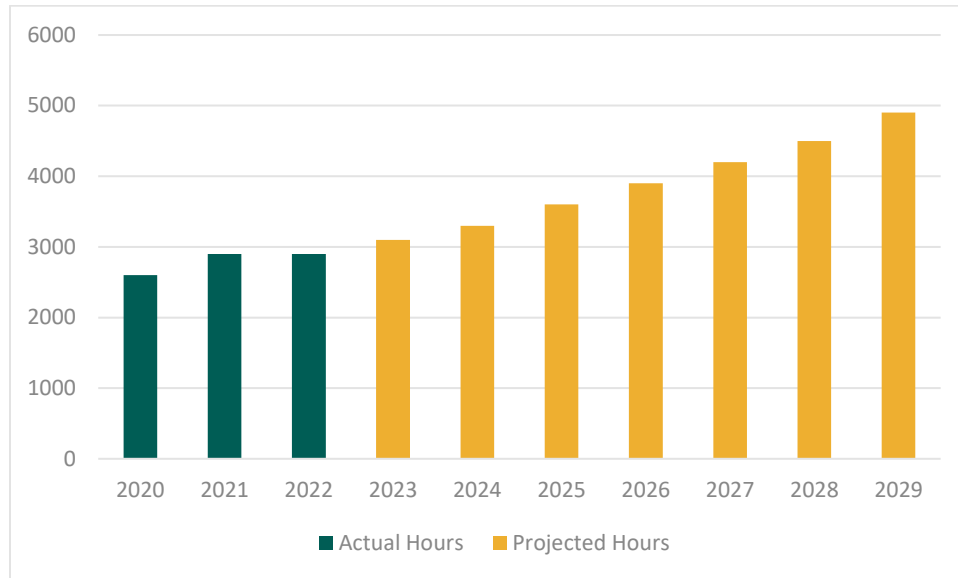


Figure 1 – Actual and Projected Vault Access Hours

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4.2 Cost Control and Productivity Measures

4.2.1 Cost Management

Toronto Hydro undertakes a number of measures to control costs in this Program. Under the Customer Connections segment, Toronto Hydro reviews pre-payment values on a project basis to ensure they cover a reasonable portion of the initial investigation work and mitigate financial risks should the project not proceed.

At the end of 2023, Toronto Hydro is expected to launch the Service Request Form Enhancements on the Customer Connections Portal. This portal will allow customers to submit service request forms online, including with attachments, for new and existing services. These enhancements will streamline the process and increase efficiency for customers by having unique forms for different kinds of requests ensuring that the appropriate information is collected, minimizing back and forth with the customer. The

1 online portal will also improve data collection and reporting for regulatory and
2 governance purposes, which will also assist with future capacity planning.

3 Under the Key Account segment, the Key Accounts team integrates data from numerous
4 sources which allows for a more complete understanding and timely analysis of customer
5 issues and requirements.

6

7 For the Public Safety and Damage Prevention segment, the utility is working with its locate
8 service providers (“LSPs”) to streamline the “clear” process, which indicates to customers
9 and excavators that their work will be clear of any Toronto Hydro equipment. The “clear”
10 process is when a locate request is screened in office by a trained worker prior to being
11 sent out for field locating. This process eliminates the need for an LSP to spend time and
12 effort verifying the location of Toronto Hydro assets where they do not exist and allows
13 LSPs to focus on locates that require physical presence. LSPs perform this process at a
14 lower rate due to the fact that the locate does not require a vehicle rollout or field
15 resources to attend the excavation site, improving Toronto Hydro’s compliance with
16 OUINSA requirements and saving the cost associated with dispatching LSP resources to
17 the field to conduct a physical locate.

18

19 Under the Customer-Owned Equipment Services segment, Toronto Hydro provides
20 customers vault access at its expense, recognizing that the utility gains safety and
21 reliability benefits from doing so, including the identification of potential hazards and
22 deficiencies, and ensuring that customers access the vault in a safe manner with
23 appropriate supervision to prevent damage to the utility’s distribution equipment.
24 Toronto Hydro limits free access to one 4-hour appointment per 12-month period per

1 customer.¹⁰ Customers requiring access to vaults more than once per year or for durations
2 longer than four hours are responsible for the incremental costs of access, such as VSA
3 time. This incentivizes customers to be efficient with their free access appointment and
4 better plan and optimize their paid access appointments.

5

6 In addition, to facilitate customers' interactions with the vault access program, Toronto
7 Hydro is investing in a Customer Connections Portal which will allow customers to book
8 and pay for vault access appointments online. This initiative will improve customer
9 experience by increasing the convenience of booking vault access appointments and
10 reduce the administrative costs of the program by reducing manual work for appointment
11 scheduling and payment processing.

12

13 *4.2.2 Productivity*

14 *Customer Connections*

15 In 2021, Toronto Hydro integrated its Customer Offers and Sustainment group and
16 Execution team with the Distribution Projects East and West teams (designers,
17 construction teams and managers) into one team enabling any project (capital or
18 connections) to be executed by this team. Previously, these groups were separated and
19 dedicated to either capital or connections projects. This change allows the team to better
20 coordinate customer connection work with capital work in order to find efficiencies
21 because the designers have more direct information about the planned projects in each
22 category. This change also enables the designers to adapt to variable volumes of work
23 between capital and connections projects.

¹⁰ The appointment length is based on the average historical appointment duration that customers have required to complete their vault access visits.

1 In 2022, Toronto Hydro created two new teams – the customer intake team and the pre-
2 design team – to streamline the customer connection process and ensure an efficient
3 allocation of resources:

- 4 • **Customer Intake team:** Improves the customer experience by creating a single point
5 of contact for all customer inquiries related to connections. Previously, customers
6 could initiate a connection request through several different channels creating the
7 risk of inefficiencies and an inconsistent customer experience. By having a single point
8 of contact, Toronto Hydro ensures that all connection-related requests are directed
9 to the appropriate teams. The intake team also ensures that customer application
10 forms are complete and contain accurate information.
- 11 • **Pre-Design team:** Acts a single point of contact for customers to ensure all the
12 information required by the design teams for large connections (i.e. requiring
13 expansion) is collected before moving forward to the design phase. This team also
14 performs administrative functions previously handled by designers, such as collecting
15 and reviewing pre-payment values. As a single point of contact, the pre-design team
16 avoids the need for customers to repeat information through out the process and
17 minimizes delays with proceeding with the project due to lack of required
18 information. By assisting with administrative functions, the Pre-Design team frees up
19 capacity for the design team to stay focused on design work.

20 Key Accounts

21 Key Accounts has continued to mature since formation in 2021 and now carries out an
22 important role in managing large connections projects during the design and construction
23 phases, acting as a single point of contact to the customer. By performing this function, it
24 improves the customer experience by streamlining responses, and allows technical

1 resources to focus their efforts on value added activities, rather than managing the overall
2 project.

3
4 Public Safety and Damage Prevention

5 Toronto Hydro is working with the Locate Alliance Consortium (“LAC”), through which
6 utilities and other infrastructure owners coordinate in purchasing locate services in
7 specific geographical areas and share costs accordingly. This approach allows a single LSP
8 to perform locates on behalf of all participating utilities within a geographical area, which
9 streamlines the quality, timing, and efficiency of the locate process compared to multiple
10 LSPs individually performing a locate for each infrastructure owner. This approach is also
11 environmentally friendlier as fewer vehicles are required to attend the job site and
12 conduct each locate.

13
14 Toronto Hydro is also working with other infrastructure owners and Ontario One Call to
15 reduce the amount of unjustified locate requests, i.e. where an excavator requests a
16 locate without the intent of excavating within the statutory validity period of 60 days.
17 Early and unjustified locate requests in this manner result in the utility having to complete
18 multiple locates for the same work, increasing costs without providing any benefits to the
19 excavator or other stakeholders. By working to educate excavators and the general public
20 on appropriate locate use, Toronto Hydro expects to encourage more prudent and
21 efficient locate requests in order to minimize excavators’ wasteful mobilization of locate
22 resources.

23
24 Customer-Owned Equipment Services

25 When possible, Toronto Hydro schedules VSA appointments to multiple addresses in
26 clusters to ensure one VSA can cover numerous appointments in a single day. As requests

1 are received Toronto Hydro staff also optimize the scheduling and planning of vault access
2 requests by considering the relevant vault locations and access times to reduce travel
3 time for VSAs between appointments. In addition, the utility coordinates with customers
4 who own multiple vault locations to schedule a single VSA for a day to maximize the
5 efficiency of the customer's vault access.

6

7 **5. CUSTOMER CONNECTIONS SEGMENT**

8 **5.1 Segment Description**

9 The Customer Connections segment is driven by customer requests to connect to Toronto
10 Hydro's distribution system or service upgrades for existing customers. Serving one of the
11 fastest growing cities in North America, Toronto Hydro receives a high volume of requests
12 for connections and upgrades for residential and commercial developments each year.

13

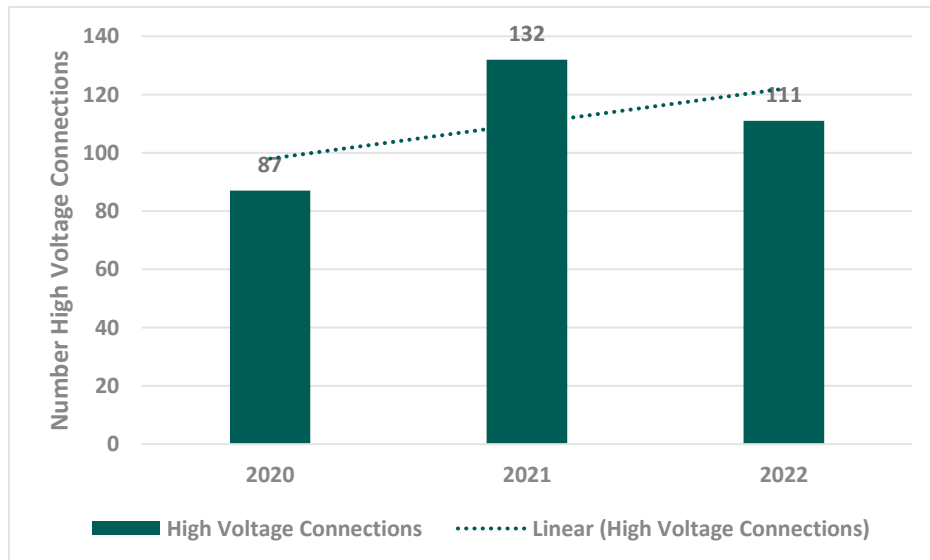
14 The Customer Connections segment is responsible for handling all communications with
15 customers relating to connection and upgrade requests. The team manages a project
16 from intake through to closure providing a single point of contact for all customer
17 requests and communications related to a connection. This ensures a consistent and
18 efficient customer experience.

19

20 Requests for connection vary in location, load requirements and the complexity of
21 underlying planning or construction work. In accordance with its regulatory obligations,
22 Toronto Hydro must connect a customer to its distribution system within prescribed
23 timelines if that customer and the associated connection meet all technical requirements
24 outlined in the DSC (Section 7.2) and the utility's Conditions of Service. Customer
25 connections can be in the form of a basic connection, or a connection requiring expansion

1 work. The types of connections Toronto Hydro performs can generally be divided into two
2 categories as follows:

- 3
- 4 • **Low Voltage Requests:** These requests primarily relate to residential and small
5 commercial customers that utilize existing Toronto Hydro transformation for their
6 connection. As shown in Figure 1, the high volume of requests presents challenges as
7 they require extensive project coordination and administrative oversight. The level of
8 work is typically seasonal and has a relatively short turnaround time. To meet its
9 service obligations, Toronto Hydro works with customers to provide options for a new
10 connection or service upgrade.
 - 11 • **High Voltage Requests:** These requests primarily relate to larger residential and
12 commercial developments with dedicated transformation on customer property.
13 These customers typically engage Toronto Hydro years before service is required.
14 Figure 2 provides a year-over-year comparison of the volume of new formalized High
15 Voltage requests that Toronto Hydro receives on an annual basis.



16

Figure 2: High Voltage Connection Requests (2020-2022)

1 Following the receipt of a connection request, Toronto Hydro works with prospective
2 customers to develop an appropriate connection design, calculate the design pre-
3 payment, and establish a mutually satisfactory construction schedule. Given the high
4 density of Toronto's urban core, there could be instances of localized capacity constraints
5 at many of the utility's Transformer Stations and Municipal Stations as well as spatial
6 restrictions of existing underground or overhead easements. As such, Toronto Hydro may
7 be required to undertake expansion and enhancement work to enable safe and reliable
8 power. Projects with expansion work typically require connections that extend beyond
9 the closest pole or cable chamber, resulting in work on various sections of the circuit or
10 sometimes the entire circuit. Such work is complicated and requires a specialized team
11 (including designers and distribution and stations engineers) to plan the system to
12 accommodate the connection. Customer jobs requiring expansion work entail
13 significantly more resources to prepare an offer to connect.

14

15 Figure 3 illustrates the year-over-year volumes of Offers to Connect requiring expansion
16 projects. Over the past three years, both the volume and average complexity of expansion
17 work remains high.

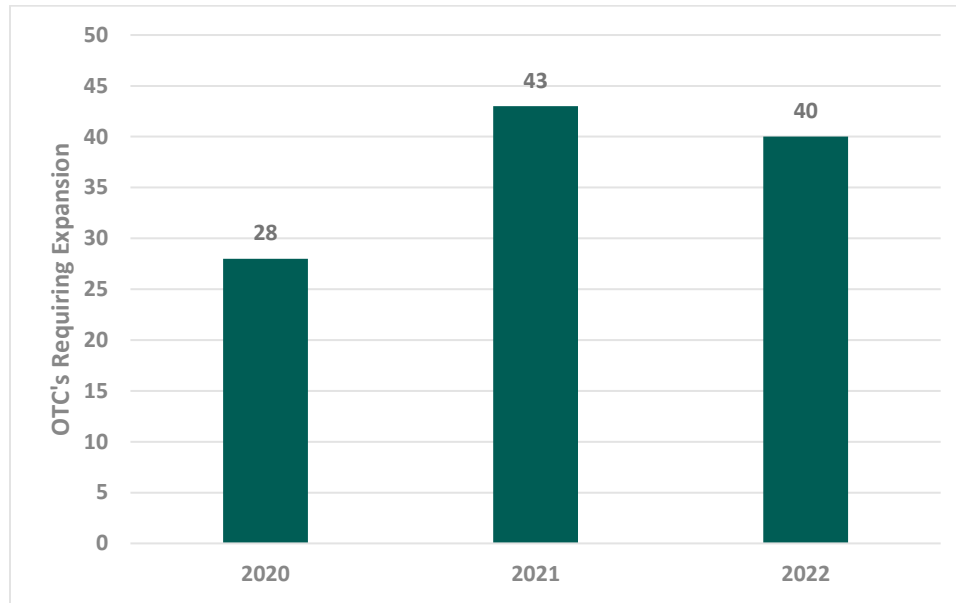


Figure 3: Number of Connections Requiring Expansion Work (2020-2022)

1

2

3 Given the current pace of Toronto’s growth and the volume of large connection requests,
4 Toronto Hydro identifies and addresses areas where insufficient connection capacity
5 exists or is projected to materialize in the near or medium term. In this regard, the utility’s
6 customer connection work also entails an analysis of development plans prepared by
7 provincial and municipal agencies and private development firms. Toronto Hydro
8 incorporates the results of this analytical work into its load forecasts, system upgrade,
9 and expansion plans.

10

11 Throughout the duration of connection planning and design activities, Toronto Hydro
12 maintains frequent communications with prospective customers to effectively manage
13 their expectations and accommodate their evolving requirements or concerns, where
14 applicable. This includes the Key Accounts team which supports existing and new key
15 account customers. If planned or ongoing connection work may temporarily affect service
16 quality, reliability or otherwise cause disruptions for existing Toronto Hydro customers,

1 the utility endeavours to ensure that affected customers receive timely notifications and
 2 are able to provide input regarding the scheduling of planned activities.

3

4 The utility recovers eligible costs associated with the planning and execution of
 5 connection work from the requesting customers in accordance with the DSC and other
 6 relevant Ontario Energy Board and internal policies. The remainder of the costs are either
 7 capitalized or recovered through operating costs as described below.

8

9 Finally, operating costs related to customer connection work also include Program
 10 support costs such as tools and equipment, information technology, vehicle and
 11 occupancy costs.

12

13 **5.2 Customer Connections Segment Costs**

14 Toronto Hydro requires approximately \$3.5 million each year during the 2025 to 2029
 15 period to execute the functions in this segment.

16

17 Table 4 provides the Actual (2020-2022), Bridge (2023-2024), and Forecasted (2025-2029)
 18 expenditures for the Customer Connection segment.

19

20 **Table 4: Customer Connections Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Customer Connections	3.7	1.6	1.6	3.2	3.6	3.2	3.3	3.5	3.6	3.8

21

22 The 2025-2029 forecast represents an increase of \$0.8 million over Toronto Hydro's 2020-
 23 2024 average annual cost of \$2.7 million.

1 **5.3 Customer Connections Segment Variance Analysis**

2 2020-2021 Variance Explanation

3 The costs from 2020 to 2021 decreased by \$2.1 million due to restructuring of the
4 customer connections team and costs being allocated to other teams.

5

6 2021-2022 Variance Explanation

7 There was no variance from 2021 to 2022.

8

9 2022-2025 Variance Explanation

10 Between 2022 and 2025 costs in this segment are expected to increase by \$1.6 million or
11 an average of \$0.5 million per year due to:

- 12 • Increased headcount to address increased volumes and complexity of connections
13 activity to support increased growth and electrification in the city of Toronto;
- 14 • Normal course compensation increases;
- 15 • the creation and ramping of two new teams, the Customer Intake Team and Pre-
16 Design team;
- 17 • This is offset by slight decreases due to expected retirements.

18

19 2025-2029 Variance Explanation

20 Between 2025 and 2029 costs in this segment are expected to increase by \$0.6M, or an
21 average of \$0.2M per year, to maintain the resourcing capacity and capabilities required
22 to support the increased volume and complexity of work discussed above. If Toronto
23 Hydro was forced to deliver this segment with a reduced level of funding over the 2025-
24 2029 rate period, the utility could face various risks and drawbacks, such as a reduced
25 ability to provide potential customers safe and reliable connection options in a timely
26 manner. An in-depth analysis is required to determine the impact of a new customer on

1 the grid to ensure system integrity, and insufficient funding could compromise the ability
2 to properly conduct this analysis;

3

4 **6. KEY ACCOUNTS**

5 **6.1 Segment Description**

6 Toronto Hydro's Key Account customers are those customers who have critical loads,
7 including:

8

- 9 • Customers who have electricity use greater than 1MW at a single site or combined
10 across a number of sites – this is increasingly including data centres and large
11 developments;
- 12 • Priority loads such as hospitals and financial institutions;
- 13 • Essential public services including the TTC and schools; and
- 14 • Developers.

15 Many of these customers are critically important to the economic and social fabric of
16 Toronto. These customers often have distinct needs and priorities including:

17

- 18 • **Power quality and reliability:** Generally, a top priority for these large customers.
19 Depending on the nature of their operations, even momentary interruptions can incur
20 high costs due to loss of product or create health and safety issues in the operation of
21 critical infrastructure.
- 22 • **Complex Connections and Expansions:** Many Key Account customers have large or
23 complex connections, such as data centres and real estate developments, which
24 require additional support and resources through all phases of their projects.

1 • **Environmental Social & Governance (ESG) goals:** Many Key Account customers are
2 already planning for the energy transition towards decarbonization and may have
3 their own ESG goals to meet.

4 • **Behind-the-Meter (BTM) energy solutions:** Many Key Account customers are
5 interested in adopting BTM energy solutions to address a range of issues from back
6 up supply, ESG targets and cost management through peak shaving and load shifting.

7
8 Because of these unique needs, Key Account customers require a tailored level of
9 customer service. The Key Accounts team proactively engages with these customers on a
10 wide range of topics (described below) to ensure that work is coordinated with customers
11 and Toronto Hydro's crews can complete work in a timely and efficient manner.
12 Specifically, Key Accounts acts as a single point of contact within Toronto Hydro for work
13 related to these customers, including:

- 14
- 15 • Facilitating and assisting with scheduling and planning for major capital and
16 maintenance projects, operational requirements, and regulatory compliance;
 - 17 • Liaising with departments across Toronto Hydro including: engineering, design and
18 construction, and operations;
 - 19 • Meeting with customers to resolve billing issues, coordinate planned outages, and
20 provide business-specific updates during unplanned outages;
 - 21 • Resolving issues related to reliability and power quality;
 - 22 • Discussing opportunities for reducing emissions and meeting decarbonization goals;
 - 23 • Partnering with the IESO to support the delivery of Local Incentive Programs;¹¹ and,

¹¹ Under previous Conservation and demand Management frameworks, the Key Accounts function worked with large customers to access provincial funding for energy efficiency programs.

- 1 • Providing account and sector specific information through various channels such as
2 direct mail, newsletters, workshops, and association outreach.

3
4 As the needs of large customers continue to evolve, the Key Accounts function has also
5 evolved to emphasize more proactive engagement with these customers. The Key
6 Accounts team had 490 meetings with customers in 2021. In 2022, the Key Accounts team
7 had 1139 engagements with customers, including 723 customer meetings, as well as
8 emails and phone calls.

9
10 Through regular outreach and structured meetings with developers and current and
11 future customers, the Key Accounts team is able to obtain information and insight into
12 development and growth plans across the City of Toronto and gain insight into
13 connections much earlier in the planning process. This can include projects that are
14 contemplated for ten or 20 years in the future. Where necessary, the Development
15 Planning team will be involved, along with the Key Accounts team, to provide technical
16 information and ensure that relevant information is incorporated into future forecasting
17 information.¹² Traditionally, Toronto Hydro would not be engaged until much later in the
18 development process –approximately a year or two before the project was set to begin –
19 which provided less opportunity to efficiently integrate necessary expansions into
20 system-level planning.

21
22 Key Accounts is also engaged by the Customer Connections team when large connection
23 requests are received, validated, and pre-design payments are made. This is the beginning
24 of the relationship that Key Accounts has with the customer (or a continuation in the case
25 of an existing Key Account customer). Through initial meetings, the team understands the

¹² See Exhibit 2, Sections E7.4 Stations Expansions and E5.3 Load Demand.

1 customers' goals, and shares a high-level overview of the connections process that the
2 customer will experience. Engagements continue with the customer throughout the life
3 cycle of the project, ensuring a streamlined customer experience. A significant area of
4 value that Key Accounts delivers is in ensuring timely handoffs between internal teams;
5 when cross-departmental decisions must be made pertaining to connections, the team
6 coordinates meetings and ensures internal alignment before communicating with
7 customers.

8
9 Key Accounts also works with customers to understand their energy management needs,
10 including supporting customers with their decarbonization goals. If customers are
11 considering incorporating new technologies¹³, the Key Accounts team consults with
12 customers to ensure that new technologies meet Toronto Hydro standards and
13 Conditions of Service, generally with support from the appropriate teams internally.

14 Key Accounts leverages its relationships to support the distribution system more broadly
15 including through the procurement of demand response and other flexibility services to
16 the benefit of both key account customers and the grid as a whole. In addition, by
17 engaging early with Key Account customers, Toronto Hydro is provided with insight into
18 areas of growth and changing customer needs which allows Toronto Hydro to better plan
19 for future system needs.¹⁴

20

21 **6.2 Key Account Segment Costs**

22 Table 5 provides the Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-
23 2029) expenditures for this segment.

¹³For example, electrification of space and water heating, electric vehicles, energy efficiency and demand management, or installation of behind the meter solar and/or battery systems.

¹⁴ For more information see Exhibit 2B, Section B3 – Coordinated Planning.

1

2 **Table 5: Key Account Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Key Accounts	-	0.5	0.8	0.9	1.2	1.5	1.5	1.7	1.8	1.9

3

4 **6.3 Key Accounts Segment Costs Variance Analysis**

5 2020-2021 Variance Explanation

6 The costs from 2020 to 2021 increased by \$0.5 million due to team formation and
 7 onboarding of resources midyear.

8

9 2021-2022 Variance Explanation

10 The costs from 2021 to 2022 increased by \$0.3 million due to this being the first full year
 11 of resource expenditures.

12

13 2022-2025 Variance Explanation

14 The costs from 2022 to 2025 are expected to increase by \$0.7 million or an average of 0.2
 15 million per year due to increases in headcount to ramp up operations of the team and
 16 inflationary increases.

17

18 2025-2029 Variance Explanation

19 Between 2025 and 2029 costs in this segment are expected to increase by \$0.4M, or an
 20 average of \$0.1 million per year, to maintain the resourcing capacity and capabilities
 21 required to support the increased volume and complexity of work discussed above. If
 22 Toronto Hydro were forced to deliver this segment with a reduced level of funding over
 23 the 2025-2029 rate period, the utility could face various risks and drawbacks, including:

- 1 • Limited opportunity for ongoing interactions and collaborative relationships with
- 2 large customers to identify and meet their unique needs; and
- 3 • Potentially becoming a barrier to customer choice for electrification and other new
- 4 technologies for large customers who may require additional support and
- 5 coordination in order to execute electrification strategies.

6

7 **7. PUBLIC SAFETY AND DAMAGE PREVENTION SEGMENT**

8 **7.1 Segment Description**

9 The Public Safety and Damage Prevention segment consists of the governance, oversight,
10 and execution of work to ensure public safety and prevent potential damage to Toronto
11 Hydro's distribution equipment when customers (or their contractors) perform work in
12 proximity to the utility's assets. The primary activity in the segment is identifying the
13 location of Toronto Hydro's underground infrastructure (commonly referred to as
14 "locates") pursuant to the OUINSA. The utility responds to locate requests forwarded
15 through Ontario One Call by identifying and marking the location of its underground
16 infrastructure in accordance with applicable statutory requirements.

17 The OUINSA mandates all excavators in Ontario, who may be homeowners, contractors
18 working for property and infrastructure owners, developers, or other utilities, to use the
19 Ontario One Call service to request a utility locate to confirm that the work area does not
20 contain any underground infrastructure. The locate process is intended to ensure public
21 safety and prevent damage to underground infrastructure. As previously discussed,
22 following the enactment of Bill 93 in April 2022, the OUINSA incorporates strict
23 compliance requirements for both infrastructure owners and excavators, and provides
24 recourse for both sides in the event that a party suffers losses or expenses due to
25 another's failure to fulfill statutory obligations. Therefore, Toronto Hydro is required by

1 law to comply with the OUIINSA framework and is responsible for the costs of performing
2 requested locates its service territory.

3

4 The utility outsources the locate function to LSPs, who process requests received through
5 Ontario One Call and identify the location of Toronto Hydro's underground infrastructure.
6 The utility currently provides locate services upon request at no charge to the requesting
7 excavator and recovers the costs through its distribution revenue requirement. This
8 encourages widespread use of the service, which yields significant public safety and
9 reliability benefits from properly locating underground infrastructure and enabling safe
10 excavation practices. By avoiding damage to distribution equipment and infrastructure,
11 the risk of outages and the likelihood of safety hazards for construction and utility workers
12 and the public are significantly reduced.

13

14 As an infrastructure owner and thus a "member" under the OUIINSA, Toronto Hydro is
15 required to pay Ontario One Call for the locate request intake services and general
16 oversight the latter provides. The utility must also cover the costs of LSPs performing the
17 actual locate work. The cost of an individual locate varies depending on the nature of
18 work requested and the timeline for its execution.

19 Segment activities also include the planning and execution of alternate locate agreements
20 ("ALAs") with any excavator that meets Toronto Hydro-specified requirements. ALAs
21 allow excavators who use the hydrovac excavation method to excavate without the
22 requirement of a utility locate because the excavation method presents a significantly
23 lower risk of damage to utility infrastructure. Through an ALA, the utility assigns the
24 excavator a blanket locate clearance through a contractor identification number. This
25 identification number allows Ontario One Call to filter related locate requests out of the
26 general intake of locate requests and into the ALA clearance process, allowing the

1 excavator to obtain immediate approval to perform shallow excavation. Through this
 2 approach, excavators are able to commence excavation work earlier than the standard
 3 five-day turnaround time for locates and Toronto Hydro is able to minimize the costs
 4 associated with completing the locate. As a result, ALAs lead to higher customer
 5 satisfaction, require less coordination and oversight from Toronto Hydro, and enable cost
 6 efficiencies.

7

8 **7.2 Public Safety and Damage Prevention Segment Costs**

9 Table 6 provides the Historical (2020-2022), Bridge (2023-24), and Forecast (2025-2029)
 10 expenditures for this segment.

11

12 **Table 6: Public Safety and Damage Prevention Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Public Safety & Damage Prevention	4.7	4.4	5.4	7.3	6.8	6.7	6.9	7.0	7.2	7.3

13

14 As discussed in section 4.1 above, this cost forecast includes increased labour costs and
 15 other types of segment costs known at the time of filing, although there remains a great
 16 degree of uncertainty regarding the full extent of locates-driven costs that Toronto Hydro
 17 may need to incur in the 2025-2029 period to achieve compliance with OUINSA.
 18 Therefore, if there are any additional material developments that may affect the 2025-
 19 2029 segment cost forecasts while the evidentiary record is open during this rate
 20 application proceeding, the utility will adduce additional evidence as required. To enable
 21 adequate funding of locates work, which is non-discretionary, while ensuring compliance
 22 with the utility’s legislative and regulatory obligations during the next rate term, Toronto
 23 Hydro also requests continuation of the GOCA Variance Account to record the
 24 incremental costs of locates resulting from the implementation of the OUINSA, as
 25 discussed in Exhibit 9, Tab 1, Schedule 1.

1 Alternatively, if the OEB were to approve neither the forecasted costs laid out in Table 6
 2 above nor the request for continuation of the GOCA variance account, Toronto Hydro
 3 would have to provision in its forecast of 2025-2029 rates for a higher recovery of locates
 4 costs that the utility would have to incur to achieve 100 percent compliance with OUINSA during
 5 the 2025-2029 rate period. Table 7 below shows the estimated costs for this scenario.

6

7 **Table 7 Public Safety and Damage Prevention Segment Expenditures Provisioning for**
 8 **Lack of Continued Availability of the GOCA Variance Account (\$ Millions)**

2025	2026	2027	2028	2029
10.4	11.4	12.3	13.4	13.9

9

10 **7.3 Public Safety and Damage Prevention Segment Year-over-Year Variance Analysis**

11 **2020 – 2021 Variance Explanation**

12 There was a decrease of \$0.3 million between 2020 and 2021 due to continued impacts
 13 on the construction industry from COVID-19 shutdowns, reducing volumes of locates.
 14 During COVID-19 shutdowns, locates were mainly driven by excavations related to large
 15 projects, essential services, and critical infrastructure.

16

17 2021 – 2022 Variance Explanation

18 There was an increase of \$1 million between 2021 and 2022 primarily driven by
 19 inflationary labour costs and an increase in the volume of costlier multi-segment locate
 20 requests.

21

22 2022 – 2025 Variance Explanation

23 Between 2022 and 2025 costs in this segment are expected to increase by \$1.3 million
 24 or an average of \$0.4 million due to:

- 1 • Cost increases arising from stricter locate performance standards imposed by Bill 93
2 including:
- 3 ○ Increased labor costs due to Toronto Hydro new contract with the LSPs; and,
 - 4 ○ Cost increases arising from stricter locate performance standards (including
5 increased volumes);
- 6 • Annual inflationary cost increases;
- 7 • Increased volumes due to general growth;
- 8

9 2025-2029 Variance Explanation

10 Between 2025 and 2029 costs in this segment are expected to increase by \$0.6M, or an
11 average of \$0.2M per year, to maintain the resourcing capacity and capabilities required
12 to support the increased volume and complexity of work discussed above. If Toronto
13 Hydro were forced to deliver this segment with a reduced level of funding over the 2025-
14 2029 rate period, the utility could face various risks and drawbacks, including:

15

- 16 • Digs by excavators without proper information about the location of underground
17 infrastructure, which could potentially result in damage to distribution assets, system
18 outages, and major safety risks to field workers or the public;
- 19 • Reduced performance in providing locate information in a timely manner, resulting in
20 administrative monetary penalties and other compliance enforcement actions by
21 Ontario One Call; and,
- 22 • Inability to comply with stricter locate performance standards imposed by Bill 93.

1 **8. CUSTOMER-OWNED EQUIPMENT SERVICES SEGMENT**

2 **8.1 Segment Description**

3 The work comprising this segment enables Toronto Hydro's commercial, industrial and
4 multi-unit residential building customers to safely perform periodic maintenance
5 activities on their (customer-owned) civil infrastructure and other equipment, and
6 facilitates the notification of deficiencies, thereby improving the reliability and safety of
7 the distribution system.

8
9 *8.1.1 Vault Access*

10 Customers are responsible for supplying, maintaining, repairing, and otherwise modifying
11 all civil assets located on their property, and any civil infrastructure located on public road
12 allowances that serve unmetered connections. The applicable infrastructure includes
13 poles, cable chambers, transformer rooms, transformer vaults, hand wells, junction
14 boxes, and other equipment housing or supporting Toronto Hydro's connection assets.
15 The most common type of customer equipment access relates to transformer vaults
16 located on customers' property. In the interest of public safety, the utility places locks on
17 transformer vault doors, to ensure that only qualified personnel have access to these
18 rooms and the high-voltage electrical equipment they contain. From time to time,
19 Toronto Hydro customers require access to vaults for periodic maintenance and
20 inspections, or to perform repairs identified as necessary during prior site visits, e.g.
21 through the Customer Action Form process described below in subsection 6.1.2.

22

23 There are over 8,600 customer-owned vaults in Toronto Hydro's service territory that
24 contain distribution equipment. Where required, a customer-owned vault may contain
25 fire detection equipment, which must be inspected annually in accordance with the
26 applicable legislative and regulatory requirements. During vault inspections by customers

1 and/or third parties, Toronto Hydro requires qualified staff, i.e. a vault safety agent
2 (“VSA”) to attend for safety purposes and to prevent damage to the utility’s assets. VSAs
3 ensure that access to the customer-owned vault is completed safely by all who enter by
4 ensuring that limits of approach are maintained and proper personal protective
5 equipment (“PPE”) is worn. VSAs are authorized to refuse to commence or end an
6 appointment if safety practices are not being maintained. When Toronto Hydro identifies
7 structural deficiencies with or within the vault structure, access doors, grounding
8 equipment, drainage, or other physical attributes, it provides the customer with a
9 completed Customer Action Form, which explains the nature of the deficiencies and
10 recommends corrective steps, as discussed in the next subsection.

11

12 *8.1.2 Customer Action Form (“CAF”) Process*

13 Toronto Hydro issues customers and property owners a CAF when any electrical or civil
14 deficiencies are found in the field on customer-owned equipment or structures.
15 Customers are responsible for replacing or repairing their defective electrical equipment
16 and those that own a transformer vault are responsible for inspecting, maintaining,
17 repairing and replacing their vault when necessary.¹⁵ As unaddressed deficiencies may
18 cause damage to equipment or expose them to other risks (such as weather exposure,
19 flooding, or premature deterioration of asset conditions), corrective work by customers
20 is necessary to maintain the safety and reliability of both utility-owned and customer-
21 owned electrical equipment and civil infrastructure, and mitigate the risk of potential
22 outages. In addition, the Electrical Safety Authority (“ESA”) requires distributors to
23 address deficiencies with customers to ensure public safety and Toronto Hydro’s CAF
24 process plays the primary role in fulfilling this obligation. The utility issues approximately

¹⁵ Examples of such electrical equipment or civil assets include electrical meter bases, stand pipes, transformer vaults that house high voltage equipment, etc.

1 2,000 electrical and 1,500 civil defect CAFs each year. The vault access process discussed
2 above in section 6.1.1 is key to enabling many customers' compliance with the
3 requirements of CAFs.

4

5 Toronto Hydro continues to improve upon its rigorous CAF process to ensure that
6 customers are clearly made aware of their deficiencies and corrective obligations and are
7 able to easily communicate with the utility. This supports the repair or mitigation of noted
8 deficiencies and contributes to the continued safe and reliable operation of the
9 distribution system. For example, where a customer increases the frequency of debris
10 removal from their vaults and drain cleaning in response to a CAF, the risk of flooding
11 within the vault decreases, which in turn reduces the risk of transformer and vault
12 equipment damage and corrosion.

13

14 *8.1.3 Low-Voltage Isolations*

15 Toronto Hydro currently provides eligible low-income customers ("ELIC")¹⁶ one free
16 disconnection and reconnection ("isolation") per 12-month period. The utility's rationale
17 for this approach is to encourage repairs to address deficiencies identified in CAFs and
18 other customer-side work that may otherwise remain incomplete and jeopardize safety
19 or grid reliability, as the cost of isolations may be prohibitive for this group of customers.
20 In addition, this approach reduces the cost barrier for these customers where they require
21 an isolation for service modifications or upgrades, including for electrification purposes,
22 such as installing solar panels or electric vehicle chargers. It is estimated that
23 approximately two percent of customers who request low-voltage isolations are
24 designated as ELICs.

¹⁶ As defined in the Distribution System Code.

1 **8.2 Customer-Owned Equipment Services Segment Costs**

2 Table 8 provides the Historical (2020-2023), Bridge (2024-2025), and Forecast (2025-
 3 2029) expenditures for the Customer-Owned Equipment Services segment.

4
 5 **Table 8: Customer-Owned Equipment Services Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Customer-Owned Equipment Services	0.9	1.0	1.2	1.2	1.2	1.3	1.4	1.5	1.5	1.6

6

7 **8.3 Customer-Owned Equipment Services Segment Year-over-Year Variance Analysis**

8 2020 – 2021 Variance Explanation

9 There was an increase of 0.1 million between 2020 and 2021 due to increases in vault
 10 access volumes, as well as inflation.

11

12 2021 – 2022 Variance Explanation

13 There was an increase of 0.2 million between 2021 and 2022 due to increases in vault
 14 access volumes as well as inflation.

15

16 2022 – 2025 Variance Explanation

17 Between 2022 and 2025, costs in this segment are expected to increase by \$0.1 million
 18 due to increases in vault access volumes as well as inflation.

19

20 2025-2029 Variance Explanation

21 Between 2025 and 2029 costs in this segment are expected to increase by \$0.3M, or an
 22 average of \$0.1 million per year to maintain the resourcing capacity and capabilities
 23 required to support the volume and complexity of work discussed above. If Toronto Hydro

1 were forced to deliver this segment with a reduced level of funding over the 2025-2029
2 rate period, the utility could face various risks and drawbacks, including:

- 3 • Inability to provide free access in a timely manner to customer-owned equipment
4 and vaults, reducing customers' ability to maintain their equipment and civil
5 infrastructure, and potentially jeopardizing public safety and the reliability of
6 Toronto Hydro's system; and
- 7 • Inability to work with customers for the timely resolution of deficiencies and
8 hazards through the Customer Action Form process, resulting in increased safety
9 and reliability risks.

1 **ASSET AND PROGRAM MANAGEMENT**

2

3 **1. OVERVIEW**

4 **Table 1: Asset and Program Management Program Summary**

Asset and Program Management Program									
Outcomes: Customer Focus, Operational Effectiveness - Reliability, Operational Effectiveness - Safety, Public Policy Responsiveness, and Environment									
Segments:									
<ul style="list-style-type: none"> • System Planning • Standards and Policies • Flexibility Services • Program Management and Support 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
13.4	11.9	13.1	13.5	14.0	14.2	15.8	16.6	17.9	18.7

5

6 Toronto Hydro’s Asset and Program Management program (the “Program”) encompasses
 7 a wide range of asset management functions to support the reliable and safe operation
 8 of the utility’s electricity distribution system.

9

10 The functions in this Program are performed under four segments: (i) System Planning;
 11 (ii) Standards and Policies; (iii) Flexibility Services;¹ and (iv) Program Management and
 12 Support. The activities performed in these segments include:

- 13 • Equipment, materials and standards research;
- 14 • Stations and distribution system planning;
- 15 • Forecasting customer and system needs;
- 16 • Outage investigations and reliability planning;

¹ Previously referred to as Local Demand Response in Toronto Hydro’s 2020-2024 Rate Application (EB-2018-0165).

- 1 • Integration of new technologies into the utility’s system;
- 2 • Asset Information Management and Records;
- 3 • Flexibility services programs targeted at reducing system constraints at times of
- 4 maximum demand in targeted grid areas to defer or avoid the need for specific
- 5 distribution or transmission projects at a lower total resource cost;² and
- 6 • Program strategy, planning, budgeting, scheduling, resourcing, tracking and
- 7 reporting of Toronto Hydro’s distribution-related programs

8

9 The key outputs of the Program are long and short-term plans and scopes of work,

10 organized in annual work programs, for capital and maintenance investments all aimed

11 at maintaining and improving Toronto Hydro’s distribution system performance. While a

12 portion of the associated costs are capitalized (i.e. for work directly related to capital

13 planning and the execution of capital programs), this Program funds the remaining costs

14 through operational expenditures.

15

16 **2. OUTCOMES AND MEASURES**

17 The most significant output of this Program is the Distribution System Plan (“DSP”) and

18 Maintenance Plans, and their annual updates.³ As such, the outcomes detailed in the DSP

19 are indirectly enabled by this Program. The following table summarizes specific outcomes

20 directly attributable to this Program.

² Exhibit 2B, Section E7.2.

³ Exhibit 2B.

1 **Table 2: Asset and Program Management Program Outcomes and Measures Summary**

Customer Focus	<ul style="list-style-type: none"> • Contributes to meeting Toronto Hydro’s obligations for customer connections (including Ontario Energy Board mandated ESQR measures)⁴ by: <ul style="list-style-type: none"> ○ Processing and executing, in a timely manner, customer connection requests and offers to connect (both load and generation customers) as prescribed in section 7.2 of the Distribution System Code (“DSC”), ○ Routinely meeting with, engaging, and responding to customer and stakeholder requests and concerns.
Operational Effectiveness - Reliability	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s system reliability objectives (e.g. SAIDI, SAIFI, FESI-7) by: <ul style="list-style-type: none"> • Maintaining and actively managing Toronto Hydro’s system and customer-specific reliability performance, • Ensuring ongoing stewardship of the distribution system and its ability to safely and reliably function in the long-term by maintaining asset records, scheduling maintenance activities, and developing capital investment scopes of work, and • Maximizing the usage of existing assets by conducting asset condition assessments.
Public Policy Responsiveness	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s public policy responsiveness objectives by: <ul style="list-style-type: none"> ○ Ensuring regular inspection of assets to, at a minimum, comply with Appendix C of the DSC, ○ Responding to the Ontario Energy Board’s direction for utilities to consider and leverage non-wires alternatives where possible to drive rate-payer value, and

⁴ Toronto Hydro’s customer connection-related obligations include:
 (i) completing low and high voltage connections within five and ten business days respectively at least 90 percent of the time, as measured pursuant to the OEB’s new connection metrics and section 7.2 of the DSC;
 (ii) completing customer appointments in accordance with the OEB’s Appointment Scheduling and Appointments Met metrics 90 percent of the time, as per sections 7.3 and 7.4 of the DSC; and
 (iii) responding to inquiries requiring a written response within ten business days at least 80 percent of the time, as measured pursuant to the OEB’s Written Response metric and section 7.8 of the Distribution System Code. Ontario Energy Board, *Distribution System Code* (August 2, 2023).

	<ul style="list-style-type: none"> ○ Developing long-term plans for grid investment and capability-building that are responsive to the emerging pressures of electrification and the energy transition.
Operational Effectiveness - Safety	<ul style="list-style-type: none"> ● Contributes to Toronto Hydro’s public and employee safety objectives by: <ul style="list-style-type: none"> ○ By reviewing inspection findings, scheduling timely corrective work to address deficient equipment and infrastructure, and planning asset renewal investments over the medium to long-term thereby mitigating safety risks, ○ Monitoring system capacity conditions to minimize the risk of operating the system in violation of applicable design parameters through load transfer or capacity expansion projects, and ○ Actively reviewing, researching, and updating material and standards documentation related to system assets and operating procedures.
Financial Performance	<ul style="list-style-type: none"> ● Contributes to Toronto Hydro’s financial performance objectives by: <ul style="list-style-type: none"> ○ Actively mitigating system risks that can result in costly failures and associated restoration work, and ○ Enabling deferral or avoidance of capital investment where demand is uncertain to optimize capital allocation.

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3. PROGRAM DESCRIPTION

The Asset and Program Management program encompasses all functions supporting Toronto Hydro’s asset management work and its coordination through the following segments:

- **System Planning:** This segment enables Toronto Hydro to analyze distribution system performance and needs, develop the utility’s asset management strategy, develop the utility’s grid modernization plan, develop the DSP and scopes of work for executing the DSP, and manage record keeping.
- **Standards and Policies:** This segment entails the development of all design and construction standards, Conditions of Service documents, management of the

1 utility's quality programs, and facilitation of load connections through the offer to
2 connect process.

- 3 • **Flexibility Services:** Flexibility Services refers to programs that address localized
4 distribution issues through targeted procurements with customers or other third-
5 parties.⁵
- 6 • **Program Management and Support:** This segment funds activities that enable
7 the planning, budgeting, scheduling, resourcing, and tracking and reporting of
8 Toronto Hydro's distribution-related programs. It also manages changes
9 throughout the lifecycle of capital and maintenance projects.

11 **4. PROGRAM COSTS**

12 In 2025 Toronto Hydro requires \$14.2 million in rate funding for Asset and Program
13 Management program, which represents an increase of \$0.8 million over the last rebasing
14 in 2020. When normalized for shared services recoveries outlined in Exhibit 4, Tab 5,
15 Schedule 1, the expected increase in this program is \$1.2 million.

16
17 Over the 2025-2029 rate period, the utility expects the cost of this program to increase
18 by an annual growth rate of 7.1 percent which is necessary to address the program needs
19 (e.g. Planned Capital and Maintenance Work, Integrated Planning & Grid Modernization,
20 and, Work Program Management) and deliver the customers outcomes enabled by this
21 program.

22
23 Table provides the Historical (2020-2022), Bridge (2023-2024), and Forecast Years (2025-
24 2029) expenditures for each of the Program's segments.

⁵ *Supra* note 2.

1 **Table 3: Asset and Program Management Program Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
System Planning	5.6	6.1	7.5	8.1	8.1	8.4	9.1	9.5	10.0	10.3
Standards and Policies	4.7	4.5	4.3	2.8	3.0	3.2	3.2	3.3	3.4	3.5
Flexibility Services	0.4	0.2	0.2	0.8	0.8	0.2	0.9	1.1	1.6	1.9
Program Management and Support	2.7	1.1	1.1	1.8	2.1	2.4	2.6	2.7	2.9	3.0
Total	13.4	11.9	13.1	13.5	14.0	14.2	15.8	16.6	17.9	18.7

2

3 **4.1 Cost Drivers**

4 The high-level cost drivers are described below. Specific variance explanations can be
 5 found under the detailed description of each Program segment in the sections below.

6

7 *4.1.1 Planned Capital and Maintenance Work*

8 The Program is driven by the amount of capital (system access, renewal, and service) and
 9 maintenance work, and associated scopes of work that must be developed. The costs of
 10 work that is required to support these programs is generally proportional to their
 11 magnitude. For example, expenditures in system access, renewal and service will increase
 12 by approximately 30 percent in the period. Furthermore, growth and electrification,
 13 system studies and development planning need and distributed energy resource (“DER”)
 14 connections will require incremental studies, forecasts and planning, and the deployment
 15 of Intelligent Grid, Energy Storage technologies, and Non-Wires Solutions.

16

17 *4.1.2 Reactive Capital and Maintenance Work*

18 Costs are driven by the number of deficiencies identified through maintenance and
 19 inspections, and these costs are expected to increase as a result of the growing volume
 20 of deficiencies and reactive and corrective work requests generated through planned
 21 maintenance programs as well as through normal course of operations.

1 4.1.3 *Integrated Planning & Modernization*

2 Costs in the Integrated Planning & Modernization segment are driven by the need to
3 administer the annual Investment Planning and Portfolio Reporting (“IPPR”) process,
4 continuous improvement of the Asset Management System (including ISO 55001
5 alignment and certification), Grid Modernization Strategy research, development and
6 implementation, and Future Energy Scenarios modelling. There are also opportunities for
7 leveraging advanced analytics to enable data-driven decision making for applications like
8 predictive asset management, grid planning and optimization, load forecasting, etc. which
9 will require the development of additional skillsets and capabilities and greater efforts to
10 ensure accurate, up-to-date, and accessible asset information and records. These
11 programs are essential to ensure future reliability, security and cost efficiency.

12

13 4.1.4 *Standards Change Requests*

14 Costs in the Standards and Policies segment are driven by the number of standards
15 change requests submitted and required, including an anticipated increase in Standards
16 change requests to meet the needs of electrification demands.

17

18 4.1.5 *Evolving Design Standards*

19 The Standards and Policies segment costs are also driven by the need to comply with
20 applicable requirements, including Ontario Regulation 22/04 (“Electrical Distribution
21 Safety Regulation”).⁶ For instance, all installation work must be based on standard design
22 drawings and specifications, and all electrical equipment installed on the distribution
23 system must be approved pursuant to that regulation. With revisions to industry
24 standards, including Canadian Securities Administrators (“CSA”) standards on Overhead
25 and Underground Distribution Lines, standard design drawings and specifications are

⁶ Ontario Regulation 22/04, under the *Electricity Act, 1998*, S.O. 1998, c. 15, Schedule A.

1 subject to change to ensure that safety standards as per the Electrical Distribution Safety
2 Regulation are met. In addition, as Toronto Hydro continues to explore the use of new
3 technologies in its distribution system to improve reliability and operational efficiency,
4 and reduce overall operating costs, standard designs will also need to evolve to reflect
5 industry best practices.⁷

6

7 **4.2 Cost Control and Productivity Measures**

8 Toronto Hydro expects cost control and productivity measures within the Program to
9 enable cost savings and increased efficiency throughout the rate period. The overall costs
10 of the program are projected to increase throughout the rate period, but these measures
11 moderate the rate of increase.

12

13 In the System Planning segment, there is a large increase in workload due to multiple new
14 initiatives including: development of the grid modernization roadmap, support in
15 implementation of Asset Investment Planning (“AIP”), and broader technical support for
16 the customer care function that interfaces with customers considering electrification
17 activities. Despite an increased workload due to expanded scope of planning, Toronto
18 Hydro plans to manage these increasing costs through continuous improvement
19 measures, including:

- 20 • Leveraging existing and new analytics tools to improve data quality within Toronto
21 Hydro;
- 22 • Providing licenses to more employees for existing tools, such as Alteryx Designer
23 to improve productivity;⁸
- 24 • Implementing centralized online tools including:

⁷ *Supra* note 5.

⁸ Alteryx Designer is a software application used for advanced data analysis, including data preparation, blending, reporting, predictive analytics and data science.

- 1 ○ A new Microsoft SharePoint page which will be used as a central platform
- 2 for the System Studies team to receive submissions, complete reviews and
- 3 track requests;
- 4 ○ Integrating Toronto Hydro's station relay and asset data into a
- 5 consolidated database and management platform developed for Toronto
- 6 Hydro. This database acts as a central location to store and track all
- 7 settings used for maintenance and construction activities at our Municipal
- 8 Substations and Transformer Stations, improving record keeping for all
- 9 Toronto Hydro stakeholders; and
- 10 ● Strategic usage of records service providers to more cost effectively update and
- 11 maintain asset records within core systems such as the GIS, ERP, and document
- 12 management systems.

13

14 In the Standards and Policies segment, Toronto Hydro expects to maintain segment

15 expenditures below 2020-2024 levels as a result of continuous improvement measures

16 which will reap benefits in the 2025-2029 period, including:

- 17 ● Implementing the Intelex Quality Management module replacing Excel workbooks
- 18 and Access databases. The module improves productivity over previous tools and
- 19 creates a seamless workflow to manage end to end defect investigation, and
- 20 provide transparency and visibility of defect investigation progress to all
- 21 stakeholders;
- 22 ● Leveraging analytic tools (Alteryx) to automate the information extraction process
- 23 necessary for an Equipment Failure Analysis; Outputs from the workflow are
- 24 displayed through interactive dashboards (Tableau); This was implemented over
- 25 the 2020-2024 rate period.

- 1 • Redesigning Toronto Hydro’s priority decision framework, and implementing a
2 new tool, Asset Deficiency Assessment Priority Tool (“ADAPT”), resulting in a
3 significant reduction in manual engineering reviews. Specifically, between 2020
4 and 2021, the quantity of manual engineering reviews for major assets was
5 reduced by approximately 40 percent and escalations by crews was reduced by 25
6 percent;
- 7 • Launching the Asset Deficiency Web Portal - This portal allows internal personnel
8 to submit reactive work requests when deficiencies are identified. When this
9 portal was launched, Toronto Hydro also standardized the processes of gathering
10 information, and creating and reporting work request information back to the
11 requester and affected stakeholders. Standardization allows consistency and
12 limits the number duplicate work request, reducing the overall process time; and
- 13 • Migrating the Product Change requests database from Microsoft Access to
14 Customer Relationship Management (“CRM”), resulting in a centralized work
15 platform to manage Product Change requests and better communication among
16 teams involved. This was implemented in 2020. The migration to CRM also
17 resulted in drastic improvement of classification of Product Change requests,
18 resulting in better reporting and process efficiency;

19
20 In addition, much of the work performed in this segment is initiated through formal
21 change requests (e.g. change a construction standard to accommodate new equipment)
22 or informal requests for support (e.g. technical clarification regarding a design policy). All
23 instances of such services provided by this segment are tracked and categorized. The
24 data is then used to identify trends and recurring issues, and opportunities for
25 improvement and efficiency gains.

1 Please see section Exhibit 2B, Section E7.2 for details of the Flexibility Services Program
2 productivity and efficiencies.

3

4 In the Program Management and Support segment, productivity and operational
5 efficiencies are gained through broad productivity enhancements including:

- 6 • Developing a number of workflows using Alteryx data processing to automate
7 complex data analytics tasks, allowing staff to focus on other value-add tasks. For
8 example, the Preventative Maintenance Units Tracking workflow, developed in
9 2022, translates Plant Maintenance order status from SAP to maintenance unit
10 attainments. This workflow resulted in approximately 300 hours of time saved per
11 year. Overall, the total recorded 69 workflows within Program Management and
12 Support segment are estimated to have saved approximately \$420,000 saved per
13 year;
- 14 • Implementing an electronic red construction folder system to replace a physical
15 red construction folder. It is estimated that this resulted in a savings of \$276,000
16 in 2022. In addition, this contributed to significant operational benefits including,
17 decreased time to release and complete work, efficiency in searching for and
18 retrieving electronic documents, and improved access capabilities to internal and
19 external users;
- 20 • Establishing a Weekly Switching Work Plan process that ensures that the feeder
21 switching,⁹ necessary to complete the planned Capital and Maintenance program,
22 are delivered. Toronto Hydro uses synergies or bundling to reduce the number of
23 times a feeder is removed from service, leading to savings on switching costs,
24 reduced risk of not completing capital and maintenance programs on time,

⁹ Feeder Switching creates a safe work zone for field crews by de-energization of feeder to complete work

1 reduced exposure to high-voltage equipment and improved customer reliability.
2 From 2019 to 2022, approximately 2606 switching hours per year were saved
3 through bundling of outages;

- 4 • Enhancing SAP Business Planning and Consolidation (“BPC”) tool that delivers
5 planning, budgeting, forecasting, reporting and financial consolidation
6 capabilities. The new enhancements, which were implemented in July 2022, aim
7 to address gaps in the current planning process through automation of existing
8 manual efforts and processes, reduction in offline data, and use of an integrated
9 solution with a central repository, to execute end to end planning cycles between
10 finance and operations.
- 11 • Introducing new software to more efficiently track project information and
12 associated change management.

13

14 **5. SYSTEM PLANNING SEGMENT**

15 **5.1 Segment Description**

16 The work done through the System Planning segment is divided into four functional areas:

- 17 • Investment Planning;
- 18 • Capacity Planning & Intelligent Grid;
- 19 • Integrated Planning and Grid Strategy; and
- 20 • Records Management.

21

22 Together, these functional areas enable Toronto Hydro to analyze the distribution
23 system’s performance and needs, develop the utility’s asset management strategy, and
24 produce the DSP as well as scopes of work for DSP execution.

1 *5.1.1 Investment Planning*

2 The Investment Planning function allows Toronto Hydro to monitor and analyze
3 performance measures for its distribution system, identify system needs, and develop the
4 capital portions of the DSP. The analytical work undertaken includes:

- 5 • **Reliability Analysis:** System power outage data is analyzed to: (i) identify
6 performance patterns and trends related to specific types of equipment or
7 geographical areas, and (ii) develop reliability forecasts based on investment
8 scenarios. Outage data captured in specialized outage software is used to conduct
9 detailed analyses of outage events, and identify worst performing areas as well as
10 customers most affected by system outages. The analytical work performed
11 under this function is critical to identifying system needs, informing investment
12 decisions, and prioritizing work in various System Renewal and System Service
13 capital programs. The results of reliability forecasting for the plan based on the
14 DSP are provided in Exhibit 2B, Section E2. This analysis also forms the basis for
15 managing reliability targets for measures such as SAIFI, SAIDI, and FESI-6,¹⁰ both
16 from year to year and over the longer term.
- 17 • **Asset Condition Assessment:** This is done at the discrete equipment level and the
18 feeder (or station) levels to identify assets showing signs of significant
19 deterioration and in need of replacement, refurbishment or other forms of
20 intervention. This ensures the continued safe and reliable operation of the
21 distribution system. Further details on the ACA can be found in Section 6.1.2
22 below.¹¹

¹⁰ Exhibit 2B, Section C2

¹¹ Exhibit 2B, Section D3, Appendix C.

1 • **Capital System Planning:** Based on the system analysis described above, the
2 planning function creates station and distribution capital work plans for design
3 and construction, to enhance the reliability of the distribution system.

4 **Other Analyses:** The planning function supports the works of engineering groups
5 by assessing risks relating to: environment and safety (e.g. oil leak deficiencies),
6 customers (e.g. customer interruption costs, impact on large account customers),
7 legal (e.g. claims relating to property damage), and corporate brand and
8 reputation (e.g. with respect to various stakeholders, the media, specific
9 communities).

10

11 This analytical work, conducted as part of the Investment Planning function, forms the
12 basis of the development of Toronto Hydro's DSP, and contributes to individual projects
13 that together enable the utility to execute its capital and maintenance programs and
14 address reliability, condition, or system risk needs at local levels (e.g. individual
15 equipment, line sections, stations). Insights from the detailed analyses are used to
16 explore feasible mitigation options to determine optimal solutions to specific issues. If
17 the preferred solution for a particular issue is a capital investment, a scope of work is
18 created. Figure 1 below illustrates Toronto Hydro's historic and forecasted capital
19 expenditures initiated by a scope of work. Scoped work represents planned work that
20 requires design, whereas demand program represents work that is reactive in nature, or
21 requested or initiated by customers or a third party.

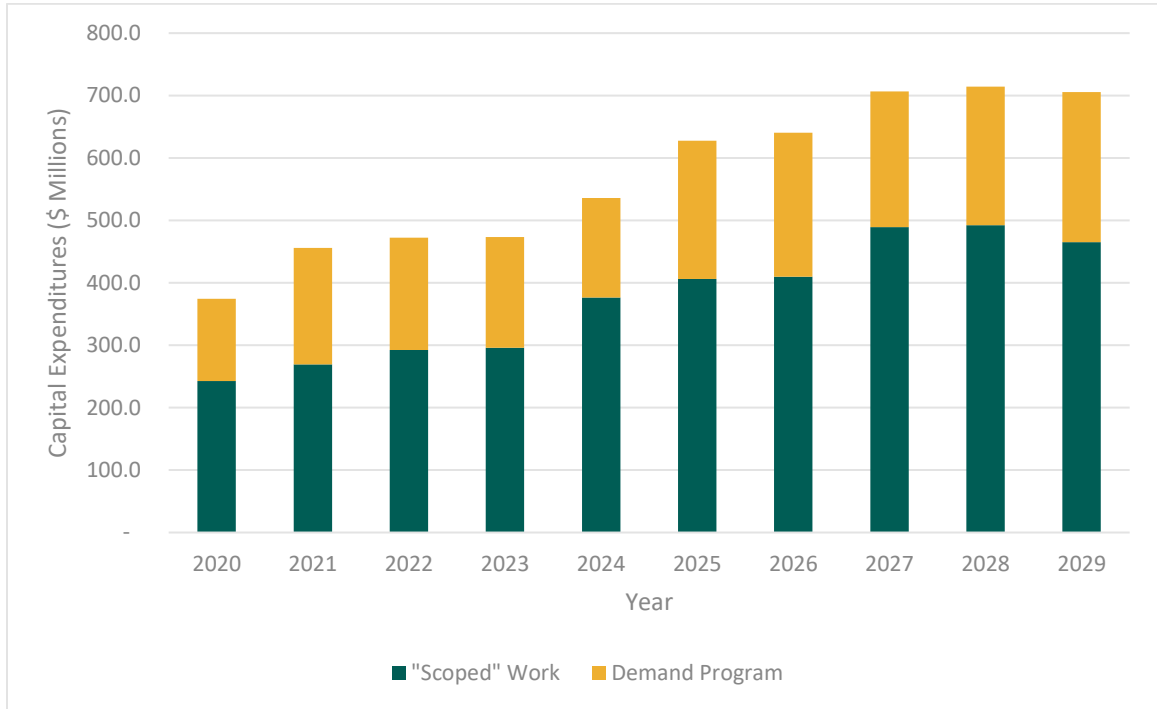


Figure 1: Value of Scopes of Work (Renewal, Service, Access)

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5.1.2 Capacity Planning and Grid Innovation

This functional area is responsible for planning the distribution system’s future load requirements driven by customer growth, and the requisite connection capacity to accommodate current and forecasted levels of DERs in Toronto Hydro’s service area. This group also identifies opportunities for adopting non-wires alternatives (including flexibility services, local demand response) to maximize the use of existing distribution system assets.

Capacity planning work requires constant monitoring of changing system characteristics, such as feeder and transformer station loadings, short-circuit levels and system performance measures. Combining system performance data with past system demand trends and known requests for load and generation connections, Toronto Hydro produces

1 system demand forecasts to determine what our system demands might be in the
2 future.¹²

3

4 Toronto Hydro has a dedicated DER Connections team that works closely with customers
5 to ensure the DER connection process is followed and timelines are met. The Capacity
6 Planning and Grid Innovation function is responsible for the capacity plan in the Customer
7 Connections Program.¹³

8

9 *5.1.3 Integrated Planning & Grid Modernization*

10 The Integrated Planning function includes staging and administering the annual IPPR
11 process, coordinating the engineering division's Distribution System Plan preparation for
12 regulatory applications, as well as developing and implementing analytics and support
13 tools to drive more effective and efficient investment planning. The function is also
14 responsible for the continuous improvement of the Asset Management System, aligning
15 to best-in-class standards, and developing the long-term asset management strategy.

16

17 The Grid Modernization function is responsible for facilitating the development,
18 integration, and strategic oversight of Toronto Hydro's long-term Grid Modernization
19 Strategy and associated roadmaps, in addition to providing market intelligence and
20 strategic forecasting of future electricity system needs and opportunities, and change-
21 management support capacity to help accelerate innovation initiatives. This function has
22 been introduced in recognition of the fact that Ontario's energy system is set to undergo
23 significant long-term changes as it becomes increasingly decarbonized, decentralized and
24 digitized. These demands have established the need for incremental resources, new

¹² Exhibit 2B, Section D2.

¹³ Exhibit 2B, Section E5.1

1 skillsets and additional third-party support within the planning and engineering functions
2 of the utility, with a specific focus on providing the specialized support and strategic
3 inputs necessary to manage a greater pace of change and level of uncertainty.

4

5 An early example of these new strategic insights is the Future Energy Scenarios (“FES”)
6 model. FES is scenario-based model developed with leadership from the Grid
7 Modernization function and support from an external modelling expert. This model
8 provides granular data on possible future changes to power demand, energy
9 consumption, generation and storage across Toronto due to decarbonization, changing
10 customer behaviours and evolving economic and policy conditions out to 2050. The
11 model also provides an assessment of the potential impacts of these changes on the
12 network.¹⁴

13

14 The 2025-2029 Grid Modernization Strategy, the development of which was coordinated
15 by the Grid Modernization function.¹⁵ Going forward, Toronto Hydro plans to mature and
16 expand the Integrated Planning and Grid Modernization functions to provide the
17 dedicated and specialized support required to deliver and accelerate the associated grid
18 modernization and innovation programs. Given the increasingly long-term and strategic
19 nature of integrated investment planning in the emerging environment, it will be
20 necessary for Toronto Hydro to continue augmenting its traditional, largely project-
21 focused planning and engineering functions with dedicated resources carrying specialized
22 skillsets, including strategic planning, smart grid engineering, cost-benefit analysis,
23 research and development, analytics, change management, and innovation expertise. For

¹⁴ Exhibit 2B, Section D4.

¹⁵ Exhibit 2B, Section D5.

1 more information on the variety of programs, initiatives, and activities these functions
2 are supporting, refer to the Grid Modernization Strategy.¹⁶

3

4 *5.1.4 Records Management*

5 The Records Management function involves the maintenance and upkeep of digital
6 records of Toronto Hydro's distribution system. Toronto Hydro's system is constantly
7 changing due to new customer connections (which results in evolving system capacity and
8 configuration), as well as equipment failures, retirements, additions and reconfigurations.
9 The utility must maintain up-to-date records to enable efficient and effective system
10 planning and operations. Toronto Hydro also maintains records of its distribution asset
11 inspections pursuant to the Electrical Distribution Safety Regulation.¹⁷ When Toronto
12 Hydro installs new assets on its distribution system on a planned or reactive basis, key
13 data management systems must be updated based on relevant installation and inspection
14 records.¹⁸ Approximately 5,500 equipment change-outs are processed annually through
15 the above systems.

16

17 Failure to update systems and records when equipment is replaced or reconfigured in the
18 system raises significant safety and reliability risks as this data is referenced and relied on
19 daily by investment planners, system controllers, designers, and trades staff across the
20 organization. The Records Management function plays a crucial role in ensuring the
21 quality and accuracy of data maintained and used at Toronto Hydro.

¹⁶ *Ibid.*

¹⁷ *Supra* note 6.

¹⁸ For example, Geographic Information System (GIS) – Referred to as GEAR (i.e. Geospatially Enabled Asset Registry), which also serves as the source of information for Toronto Hydro's DMS/NMS, and Enterprise Asset Management System (EAM) – Referred to as SAP.

1 Toronto Hydro expects the costs in the Records Management function to increase in
 2 2025-2029 to keep pace with the growing investment program and customer demands.
 3 Another driver will be an overall increase in the expected quality, availability, and
 4 integration of critical asset and system information. As discussed in Exhibit 2B, Sections
 5 D1 and D5, unlocking the potential value of advanced analytics and distribution
 6 automation will require a higher overall level of data quality and governance, which will
 7 place more demands on the Records Management function and associated departments
 8 that are responsible for handling critical asset information.

9

10 **5.2 System Planning Segment Costs**

11 Table 4 provides the Historical (2020-2022), Bridge (2023-2024), and Forecast Years
 12 (2025-2029) expenditures for the segment.

13

14 **Table 4: System Planning Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
System Planning	5.6	6.1	7.5	8.1	8.1	8.4	9.1	9.5	10.0	10.3

15

16 **5.3 System Planning Segment Year-over-Year Variance Analysis**

17 2020-2021 Variance Explanation

18 From 2020 to 2021, costs in this segment increased by \$0.5 million. This is attributable
 19 to the then new Integrated Planning & Modernization function. Grid Strategy was a new
 20 team created in 2021 under Integrated Planning & Modernization for the purpose of
 21 development of a Grid Modernization Strategy for Toronto Hydro, development of FES
 22 and pursuing ISO 55001 certification for asset management.

1 2021-2022 Variance Explanation

2 From 2021 to 2022, costs in this segment increased by \$1.4 million. There was a continued
3 ramp up of the new functions initiated in 2021 that contributed to an increase in costs. In
4 particular, the costs related to the development of FES which kicked off in 2022 and a
5 third-party consultant to perform a gap analysis and prepare plan for ISO 55001
6 certification for Toronto Hydro's Asset Management System.

7

8 2022 – 2025 Variance Explanation

9 Between 2022 and 2025, costs in this segment are expected to increase by \$0.9 million,
10 or by an average of \$0.3 million per year due to the need to further expand:

- 11 • Integrated Planning & Modernization activities to better manage planning
12 uncertainty and accelerate the adoption of value-added digital capabilities. For
13 example, analytical capability to support more rigorous long-term investment plan
14 development in response to energy transition and electrification and the
15 development and implementation of enhanced analytics and decision-support
16 tools; and,
- 17 • All increases are also generally affected by inflationary pressures.

18

19 2025-2029 Variance Explanation

20 Between 2025 and 2029 costs in this segment are expected to increase by \$1.9 million, or
21 an average of \$0.5 million per year, to maintain the resourcing capacity and capabilities
22 required to support the increased volume and complexity of work discussed above. If
23 Toronto Hydro were forced to deliver this segment with a reduced level of funding over
24 the 2025-2029 rate period, the utility could face various legal compliance risks and
25 negative consequences, including:

- 26 ○ Inefficient and ineffective system planning;

- 1 ○ Inability to support or plan capitalized work due to reduced ability to
2 monitor and analyze distribution system performance measures, identify
3 system needs, or develop the capital portions of the DSP;
- 4 ○ Decreased short- and long-term reliability of the distribution system;
- 5 ○ Inability to manage risks around growth and electrification;
- 6 ○ Inability to capitalize on synergies or maximize the use of existing
7 distribution system assets;
- 8 ○ Sub-optimal coordination with the IESO and regional planning groups, and
9 with customers for purposes of enabling distributed generation (“DER”)
10 connections (resulting in potential non-compliance with Ontario Energy
11 Board prescribed processes and timelines);
- 12 ○ Inability to develop and integrate improved analytics capabilities and
13 productivity improvement in planning, and decision support system;
- 14 ○ Inability to manage risks around modernization initiatives. For example,
15 failure to maximize benefits of new technologies due to inadequate
16 training of employees; and
- 17 ○ Significant safety and reliability risks if records and data updates are not
18 synchronized with equipment or system configuration changes (given that
19 such data is relied on by investment planners, system controllers,
20 designers, and trades staff across the organization), incomplete data
21 returned from the field and projects not completed in a timely manner.

1 **6. STANDARDS AND POLICIES SEGMENT**

2 **6.1 Segment Description**

3 The Standards and Policies Segment is responsible for the development of the utility's
4 design and construction standards, Maintenance Planning, managing the utility's quality
5 programs, and facilitating load connections through the offer to connect process.

6

7 *6.1.1 Design and Construction Standards*

8 One of the core functions of the Standards and Policies segment is the development and
9 maintenance of design, construction and equipment standards and specifications for the
10 electrical and civil construction work executed by Toronto Hydro. It is driven by the
11 Electrical Distribution Safety Regulation, which requires distributors to create standard
12 design drawings and specifications for all equipment comprising the distribution system.
13 This function has a significant focus on safety of utility workers in the public. "Safety by
14 design" is a core principle routinely applied in the utility's decision making. Toronto Hydro
15 has more than 1,000 construction standards managed by this function. Changes to these
16 standards are driven by reliability improvements, new technologies, regulatory changes,
17 and industry standards (e.g. CSA standards) revisions. Toronto Hydro processes an
18 average of 550 standard change requests per year.

19

20 *6.1.2 Maintenance Planning*

21 The Maintenance Planning function includes the analysis and preparation of Toronto
22 Hydro's maintenance plans and schedules for all components of its distribution system.
23 Toronto Hydro uses a Reliability-Centered Maintenance ("RCM") framework as the
24 foundation for its maintenance planning. RCM is an established engineering framework
25 that determines failure management policies for any physical asset in its present
26 operating context to maximize reliability and extend useful life based on the asset's

1 function and the consequences of functional failure on the distribution system. RCM
2 analyses are critical in scheduling asset maintenance programs and activities. From 2016
3 to 2018, Toronto Hydro updated the RCM results and analyses for each asset certified to
4 align with RCM best practices.¹⁹ See Exhibit 4, Tab 2, Schedules 1, 2, and 3 for details on
5 Preventative and Predictive Maintenance.

6
7 Beginning in 2017, extensive work was performed to update the ACA (based on the most
8 recent inspection results) and adopt a new ACA framework. Toronto Hydro now uses an
9 ACA framework and algorithm adopted from the Common Network Asset Indices
10 Methodology (“CNAIM”). The ACA is crucial to guiding planners in deciding which assets
11 to include in their investment plans. Since 2017, changes have been made to reflect
12 inspection program changes and to model empirical field observations. In addition,
13 Condition-driven Probability of Failure has been developed leveraging ACA data. Over the
14 2023 to 2024 period, Toronto Hydro is working to leverage its Value Framework initiative
15 to develop a full risk view within the ACA methodology.²⁰

16
17 The Maintenance Planning function also entails the review of all asset deficiencies
18 identified through maintenance and inspection activities. During the 2020-2022 period,
19 between 30,000 and 50,000 deficiencies were reported annually, and reviewed and
20 categorized for the purposes of formulating corrective and reactive responses (as detailed
21 in Exhibit 4, Tab 2, Schedule 4 Corrective Maintenance). The work undertaken in
22 Maintenance Planning is critical to both the short-term viability (e.g. by addressing

¹⁹ Applicable Standards: SAE JA-1011 (Evaluation Criteria for Reliability-Centered Maintenance (RCM) Processes).
Applicable Guideline: SAE JA-1012 (A Guide to the Reliability-Centered Maintenance (RCM) Standard)

²⁰ For details regarding the ACA model are provided in Appendix C of Exhibit 2B, Section D.

1 equipment deficiencies) and long-term viability (e.g. by prudently maintaining assets) of
 2 the distribution system.

3

4 **6.1.3 Quality Control**

5 The segment also provides services in the area of quality control throughout the
 6 equipment lifecycle. Quality audits, and reviews and investigations are conducted from
 7 when equipment and materials are procured from suppliers to when they fail in the field.
 8 Root cause analysis is the cornerstone of this segment’s quality activities. Corrective and
 9 preventative actions, often issued through non-conformance reports to Toronto Hydro’s
 10 equipment suppliers, drive improvements to standards and equipment. This segment’s
 11 quality programs play a critical role in ensuring Toronto Hydro receives equipment of the
 12 highest quality from its suppliers. Toronto Hydro receives an average of 650 pieces of
 13 failed equipment returned from the field per year.

14

15 **6.2 Standards and Policies Segment Costs**

16 Table provides the Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-2029)
 17 expenditures for the Standards and Policies segment.

18

19 **Table 5: Standards and Policies Segment Expenditures (\$ Million)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Standards and Policies	4.7	4.5	4.3	2.8	3.0	3.2	3.2	3.3	3.4	3.5

20

21 **6.3 Standards and Policies Segment Year-over-Year Variance Analysis**

22 2020-2021 Variance Explanation

23 Between 2020 and 2021 costs in this segment decreased by \$0.2 million per year. This is
 24 primarily attributed to productivity initiatives as noted in Section 4.2.

1 2021-2022 Variance Explanation

2 Similarly, between 2021 and 2022 costs in this segment decreased by \$0.2 million per
3 year. This is primarily attributed to productivity initiatives as noted in Section 4.2, and
4 organizational restructure.

5

6 2022-2025 Variance Explanation

7 Between 2022 and 2025, costs in this segment are expected to decrease by \$1.1 million
8 or an average of \$0.4 million per year due to the aforementioned productivity initiatives
9 and associated organizational restructuring.

10

11 2025 – 2029 Variance Explanation

12 Between 2025 and 2029 costs in this segment are expected to increase by \$0.3 million, or
13 an average of \$0.1 million per year to maintain the resourcing capacity and capabilities
14 required to support the increased volume and complexity of work discussed above.²¹ If
15 Toronto Hydro were forced to deliver this segment with a reduced level of funding over
16 the 2025-2029 rate period, the utility could face various legal compliance risks and
17 drawbacks, including:

- 18 • Reduced ability to facilitate load connections through the offer to connect
19 process, thus resulting in potential non-compliance with Ontario Energy Board
20 prescribed timelines;
 - 21 • Risk of not receiving the highest quality equipment from suppliers;
 - 22 • Less effective management of Toronto Hydro's quality programs; and
 - 23 • Reduced access to highly specialized engineering expertise.
-

1 **7. FLEXIBILITY SERVICES SEGMENT**

2 Please see section Exhibit 2B, Section E7.2 for details of the Flexibility Services Program.
3

4 **8. PROGRAM MANAGEMENT AND SUPPORT SEGMENT**

5 **8.1 Segment Description**

6 The work in the Program Management and Support segment can be subdivided into four
7 functional areas:

- 8 • Scope Issuance and Tracking
 - 9 • Work Program Management
 - 10 • Stations-Based Maintenance and Annual Feeder Scheduling
 - 11 • Work Execution Support
- 12

13 Together, these activities enable the planning, budgeting, scheduling, resourcing, tracking
14 and reporting of Toronto Hydro's distribution system-related programs. The segment
15 also manages changes throughout the lifecycle of capital and maintenance projects.
16

17 Additionally, this function effectively allocates work, identifies and mitigates emerging
18 risks, and coordinates and tracks capital projects and maintenance activities across the
19 utility's service territory.
20

21 **8.1.1 *Scope Issuance and Tracking***

22 The high-level objectives for the Scope Issuance and tracking function are to:

- 23 • Receive, audit, issue and track all received scopes from the system planning group;
- 24 • Assign and schedule capital projects to support the generation of detailed designs
25 for the construction of projects in the proposed project execution year;

- 1 • Ensure that the proposed work has complete details required for resourcing and
2 budgeting prior to its issuance to the operations teams for detailed design and
3 construction;
- 4 • Ensure documented budgetary estimates and changes to said estimates for capital
5 construction projects to support budgeting and resource allocation by the work
6 execution management team; and
- 7 • Track all issued scopes to completion; capturing cancellations, as well as
8 unassigned scopes to ensure assignment and execution.

9
10 *8.1.2 Work Program Management*

11 Part of the process of creating the execution work program is to check the resulting
12 project labour requirements against the available labour schedules to make the
13 appropriate resource allocations to discrete projects. Once the individual project-based
14 analysis is complete, the combined program (i.e. a collection of individual projects or
15 demand/unplanned work) is reviewed against available resources and other relevant
16 reference information on an aggregate level, to identify any inconsistencies, deficiencies
17 or sub-optimal resource utilization trends.

18
19 In addition to maintaining the program-wide resource balance, Program Management
20 staff track the status of projects in the work program and the roll-up of the projects into
21 programs and portfolios. While tracking project execution progress, Toronto Hydro seeks
22 to proactively identify and monitor known or emerging risks that can impact the
23 successful delivery of the work program, and develop the appropriate mitigation
24 strategies.

1 Lastly, Program Management staff provide regular reporting to all the stakeholders
2 through monthly reporting of divisional scorecards, meeting updates, program delivery
3 status reporting amongst others, to ensure programs are tracked, reported, risks
4 identified along with mitigation actions and visibility is provided on the executive level.

5

6 *8.1.3 Project & Work Execution Function Support (E.g. Stations-Based Maintenance and*
7 *Annual Feeder Scheduling*

8 Program Management also provides various support activities to operational
9 departments that execute capital and maintenance work. One example is annual feeder
10 scheduling. Many projects require feeders to be taken out of service to create a safe work
11 zone in accordance with safety requirements and practices. Each time a feeder is taken
12 out of service in downtown Toronto, a combination of network and customer locations
13 need to be switched. Each of these switching steps requires a crew to visit the location
14 and manually move switch handles. Once a feeder has been switched out, work on the
15 system (such as maintenance or installation of new assets) can be performed.

16

17 Toronto Hydro has utilized a “stations-based maintenance” approach to completing its
18 maintenance program dating back to 2016 to help align work requiring outages in the
19 downtown core. Given the cost and safety implications associated with switching feeders
20 on the network system, every effort is taken to combine or synergize work to achieve
21 efficiencies in work coordination.

22 Program Management and Support staff work with Operations and Control Room Teams
23 to identify synergies on downtown feeders to create safety, reliability, customer,
24 productivity and environmental benefits.

1 Other key benefits include:

- 2 • Higher attainment of capital and maintenance programs;
- 3 • Reduced execution costs and feeder outage costs due to smaller amounts of
- 4 outages required;
- 5 • Improved customer reliability due to fewer outages; and
- 6 • Enhanced system stability and flexibility with fewer feeders in an abnormal
- 7 configuration.

8

9 Other support functions include:

- 10 • Supply and equipment planning;
- 11 • Customer connection program analysis;
- 12 • Material forecasting, scheduling and management through aligning material
- 13 requirement with forecasted execution dates and liaising with the procurement
- 14 team to identify current and future year material requirements to ensure
- 15 availability;
- 16 • Aligning system and capacity planning priorities with the work execution program
- 17 as required i.e. flagged system priorities due to reliability or regulations are
- 18 scheduled timely by PMO for execution by the OPS teams;
- 19 • Key portfolio reporting and management e.g. NCMC program coordination,
- 20 management and reporting where PMO coordinates with all stakeholders
- 21 (Planning, Operations, IT and Control Room) to effectively execute the program;
- 22 and
- 23 • Performance reporting through monthly scorecards for the various departments
- 24 and divisions to flag required improvements.

25

1 During project execution, Toronto Hydro coordinates its work with the anticipated work
2 of other utilities and City of Toronto planners. This is done iteratively, from the inception
3 of a project to its completion. In the City of Toronto, it is especially critical to coordinate
4 projects and obtain permits given the scale of new development, infrastructure renewal
5 and major transit projects currently in development or construction. Work Execution
6 staff maintain the databases and business processes necessary to coordinate the work
7 and facilitate circulation of project data with other utilities. It seeks to maximize
8 collaboration between multiple teams to complete work in the most efficient manner,
9 prevent potential conflicts and reduce potential disruptions from construction projects to
10 Toronto Hydro's customers.

11

12 Work Execution staff is responsible for securing timely and accurate approvals for the
13 multiple roadway work permits Toronto Hydro requires throughout a given year. This
14 involves coordination across Toronto Hydro engineers, designers, construction teams and
15 City officials to ensure all relevant documentation is prepared in accordance with
16 Municipal Consent Requirement for the installation of plant within City of Toronto streets.

17

18 Finally, the work execution support function provides oversight and governance over
19 project and program management practices. This aims to ensure that business processes,
20 including forecasting, risk identification, change management, continuous improvement,
21 progress tracking and analytics are being used for all applicable projects and programs.
22 Given the number and variety of projects in Toronto Hydro's capital and maintenance
23 work programs, the governance function is critical to ensure the integrity and accuracy of
24 work plans and financial forecasts submitted to the Ontario Energy Board, its
25 shareholders and other neighbouring utilities. Some of these governance functions
26 include; monthly executive and senior management performance reporting, key program

1 status reporting, change request process management, project variance analysis and
 2 numerous metrics to drive process adherence and continuous improvement. In addition
 3 to providing oversight, it is also responsible for designing and maintaining procedural
 4 documents and project management tools in alignment with industry standards and best
 5 practices. This group also has ownership of the governance software systems that
 6 support these areas.

7

8 **8.2 Program Management and Support Segment Costs**

9 Table provides the Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-2029)
 10 expenditures for the Program Management and Support segment.

11

12 **Table 7: Program Management and Support Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Program Management and Support	2.7	1.1	1.1	1.8	2.1	2.4	2.6	2.7	2.9	3.0

13

14 **8.3 Program Management and Support Segment Year-over-Year Variance Analysis**

15 2020 – 2021 Variance Explanation

16 The decrease of \$1.6 million from 2020 to 2021 is attributable to organizational
 17 restructure.

18

19 2021 – 2022 Variance Explanation

20 There is no material variation in this period.

21

22 2022 – 2025 Variance Explanation

23 Between 2022 and 2025 costs in this segment are expected to increase by \$1.3 million, or
 24 an average of \$0.4 million per year due to:

- 1 • The Permit Delivery Office moving under the Program Management and Support
- 2 department;
- 3 • Normal course escalation and increases; and
- 4 • Headcount increases to support a higher volume of work.

5

6 *2025 – 2029 Variance Explanation*

7 Between 2025 and 2029 costs in this segment are expected to increase by \$0.6 million, or
8 an average of \$0.2 million per year, to maintain the resourcing capacity and capabilities
9 required to support the increased volume and complexity of work discussed above. If
10 Toronto Hydro were forced to deliver this segment with a reduced level of funding over
11 the 2025-2029 rate period, the utility could face various legal compliance risks and
12 drawbacks, including:

- 13 • Decreased service levels in respect of customer service connections requests;
- 14 • Less efficient use of design and construction labour resources, raising the risk for
15 resource stranding;
- 16 • Less effective project coordination, including sub-optimal alignment and
17 integration with third party projects;
- 18 • Reduced program delivery and integration across multiple internal stakeholders
19 such as efficient translation of strategic changes, compliance requirements from
20 planning to operations for execution, or facilitating budget creation by Finance;
- 21 • Reduced governance and reporting functions that drive crucial elements of project
22 management, such as cost controls, project performance and change
23 management; and
- 24 • Decreased risk management during operational phases.

1 **WORK PROGRAM EXECUTION**

2

3 **1. OVERVIEW**

4 **Table 1: Work Program Execution Program Summary**

Work Program Execution Program									
Outcomes: Operational Effectiveness - Reliability, Operational Effectiveness - Safety, and Financial Performance									
Segments:									
<ul style="list-style-type: none"> • External Work Execution • Internal Work Execution 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
11.0	14.2	17.3	14.3	15.2	16.0	16.8	17.9	18.5	19.4

5

6 Work Program Execution (the “Program”) is responsible for oversight, administrative
 7 training, and other functions performed in the process of executing Toronto Hydro’s
 8 capital and maintenance work programs, which are not eligible for capitalization in
 9 accordance with the utility’s capitalization policy. The Program consists of the following
 10 two segments:

- 11 • External Work Execution; and
- 12 • Internal Work Execution.

13

14 The Program and its constituent segments are a continuation of the activities described
 15 in Work Program Execution in Toronto Hydro’s 2020-2024 rate application.¹

¹ EB-2018-0165, Exhibit 4A, Tab 2, Schedule 10.

1 **2. OUTCOMES AND MEASURES**

2 **Table 2: Work Program Execution Program Outcomes and Measures Summary**

Operational Effectiveness - Reliability	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s system reliability objectives (e.g. SAIDI, SAIFI, FESI-7) by: <ul style="list-style-type: none"> ○ Undertaking oversight, administrative training and other functions performed in the process of executing Toronto Hydro’s capital and maintenance work programs; and ○ Managing the administration associated with external contractors who respond to outages and reactive calls.
Operational Effectiveness - Safety	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s safety objectives, measured through metrics such as the Total Recordable Injury Frequency (“TRIF”), by ensuring Toronto Hydro employees receive legislated safety training and possess the requisite tools and Personal Protective Equipment (“PPE”) to perform their roles in a safe manner.
Financial Performance	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s financial performance objectives by ensuring that any work completed by external contractors is allocated based on a variety of factors including safety, costs, performance and qualifications. As a result, Toronto Hydro is able to determine the most qualified and cost-efficient contractor for a specific project.

3

4 **3. PROGRAM DESCRIPTION**

5 The Program encompasses the labour costs for oversight and training activities relating
 6 to the execution of Toronto Hydro’s capital and maintenance programs. This includes
 7 coordination and support of external contractors executing a portion of Toronto Hydro’s
 8 capital and maintenance programs, the utility’s internal design and construction crews,
 9 and apprentices. These activities are performed through two segments:

- 10 • **External Work Execution**, which covers the costs required to directly administer
 11 planning and execution of the portion of Toronto Hydro’s capital and maintenance
 12 program that is completed by external contractors. This includes the issuance and
 13 oversight of capital and maintenance work to meet legislated and regulatory
 14 health and safety requirements; and

- 1 • **Internal Work Execution**, which covers the administrative and support costs for
2 the portion of Toronto Hydro’s capital and maintenance program that is
3 completed by internal labour. This segment includes safety training costs
4 (including training costs associated with the utility’s Trade School) for employees,
5 including apprentices, as well as costs for small tools issuances, PPE, logistics,
6 tracking, project-specific planning, and supervisory time not directly attributable
7 to a specific program or project.^{2,3}

8

9 **4. PROGRAM COSTS**

10 In 2025, Toronto Hydro requires \$16 million in rate funding for the Work Program
11 Execution program, which represents an increase of \$5 million over the previous rate
12 period in 2020. When normalized for shared services recoveries outlined in Exhibit 4, Tab
13 5, Schedule 1, the expected increase in this program is \$4.9 million.

14

15 Over the 2025-2029 rate period, the utility expects the cost of this Program to increase
16 by an annual growth rate of 5 percent. This increase is necessary to address the Program
17 needs while delivering the customer outcomes enabled by this Program.

18

19 Table 3, below, displays the Historical (2020-2022), Bridge (2023-2024), and Forecast
20 Years (2025-2029) expenditures for the two segments comprising the Program.

² Exhibit 4, Tab 4, Schedule 3.

³ With the exception of Power System Controllers, see Exhibit 4, Tab 2, Schedule 7.

1 **Table 3: Work Program Execution Program Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
External Work Execution	1.0	1.5	1.1	1.2	1.4	1.5	1.6	1.7	1.8	1.8
Internal Work Execution	10.0	12.7	16.2	13.1	13.8	14.5	15.2	16.2	16.7	17.6
Total	11.0	14.2	17.3	14.3	15.2	16.0	16.8	17.9	18.5	19.4

2

3 **4.1 Cost Drivers**

4 Over the 2025-2029 rate period, Toronto Hydro’s capital program is increasing by
 5 approximately 47 percent. In addition, the complexity of the utility’s work program,
 6 particularly in areas of System Access, System Renewal and System Service, is increasing
 7 as Toronto Hydro makes investments to lay the foundation for the energy transition by
 8 expanding and modernizing the grid to enable customer choice to connect new
 9 technologies such as solar panels, heat pumps and electric vehicles. To support Toronto
 10 Hydro and its customers on this electrification journey, this Program must keep up with
 11 managing increased oversight and training activities. Primarily, this means an increase in
 12 headcount in both segments as well as related increases in training costs, tools and safety
 13 equipment, and PPE.

14

15 For the Internal Work Execution segment, Toronto Hydro anticipates headcount increases
 16 for a number of key Certified and Skilled Trades and Designated & Technical Professional
 17 positions such as Power Line Technician (“PLT”), Distribution System Technologist
 18 (“DST”), Engineers and Engineering Technologist (“ETL”). All of these professions require
 19 a minimum number of hours training in order to fulfill their roles.

20

21 Engineers and ETL’s, for example, are trained on a broad range of technical topics to
 22 ensure that their solutions are practical and safe by design. PLT’s and DST’s are required
 23 to complete a number of hands on technical proficiency and legislative courses that

1 equip them to implement these designs safely and skillfully. These resources together
2 provide Toronto Hydro with the ability to design and construct its capital program. An
3 increase in this population will make it possible for the utility to achieve the increased
4 program anticipated for 2025 to 2029.

5

6 For the external segment, Toronto Hydro anticipates headcount increases for a number
7 of roles including field and project managers and project management staff to ensure that
8 Toronto Hydro is able to appropriately manage external contractors and respective
9 capital programs. As capital programs increase in both size and complexity of work,
10 resourcing requirements necessarily increase in order to maintain prioritization of safe
11 work practices, design and construction standards, and overall efficient use of capital
12 budgets. In Toronto Hydro's experience, an appropriate resource level has each manager,
13 with a supporting analyst, executing approximately \$11-13 million in capital projects
14 annually.⁴ As shown in Figure 1, Toronto Hydro's headcount plan ensures sufficient
15 resources to maintain manager numbers at this level of execution while also maintaining
16 the ratio of supporting analysts at about 1:1.

⁴ Gross EWP per year.



Figure 1: Gross EWP Output by Manager (\$ Millions)

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2
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12
13
14

4.2 Cost Control & Productivity Measures

4.2.1 Cost Management

Toronto Hydro undertakes a number of measures to control costs within this Program, some of which are aimed at reducing training costs. Through the implementation of online training modules, employees now receive a substantial portion of their requisite training online. This eliminates added costs relating to travel time, and affords employees the flexibility to view the training at times that do not interfere with operations and delivery of the work program.

Starting in 2018, Toronto Hydro concentrated annual training for design and construction field crews in two-week blocks. This allows training to be delivered in a more efficient manner, leveraging full consecutive days. This is predominantly done in full crew

1 compliments to better coordinate planning and minimizing the impact to work execution.
2 Training included in these blocks is based on specific training requirements, as well as any
3 new, timely or emerging requirements. In 2023, this training approach was applied to the
4 station and distribution automation groups, modified to one week based on the
5 department's specific training requirements.

6

7 **4.2.2 Productivity**

8 Toronto Hydro continues to look for opportunities to improve the overall productivity of
9 this Program.

10

11 As all of Toronto Hydro's external contractors have the requisite qualifications and
12 experience to engage in all areas of capital work, the utility has implemented a process
13 whereby work is allocated to specific contractors based on a variety of factors including,
14 safety, costs, performance, qualifications and resourcing capability. As a result, Toronto
15 Hydro is able to determine the most qualified and cost-efficient contractor for a specific
16 project.

17

18 With regards to training, Toronto Hydro is trialing virtual reality technologies for
19 equipment-specific tasks. This allows for a risk-free learning environment for the internal
20 work force and is productive, effective and innovative.

21

22 Administratively, a move to an online work distribution process has also allowed for some
23 productivity gains in the planning process for the reactive segment of work (supported by
24 both the internal and external work crews).

1 **5. EXTERNAL WORK EXECUTION SEGMENT**

2 **5.1 Segment Description**

3 The External Work Execution segment consists of the administration of capital and
4 maintenance work performed by external contractors. This function serves as the
5 primary point of contact between Toronto Hydro and external contractors, including
6 evaluating and administering competitive tenders for contractor services, providing
7 oversight of the resulting contracts, and administering support of the specific projects
8 assigned to external contractor crews, such as:

- 9 • Job package development and issuance;
- 10 • Liaising with system planners to address specific design matters;
- 11 • Field issues management;
- 12 • Ordering of materials;
- 13 • Facilitating changing of project scopes;
- 14 • Monitoring contractor safety practices;
- 15 • Invoicing and receipting; and
- 16 • Inspection of newly constructed assets.

17
18 This segment ensures that Toronto Hydro provides the employees overseeing this
19 function with training, safety equipment, and tools that ensure external contractors are
20 adequately monitored and compliant with legislated, regulatory and safety requirements.

21
22 The External Work Execution segment proactively engages with customers through the
23 Community Relations team.⁵ This is an integral part of the project management and
24 execution process. In addition to working with the Community Relations team, Project

⁵ Exhibit 4, Tab 2, Schedule 18.

1 Execution Managers may also meet directly with customers on site to address any
 2 concerns that customers may have, before, during and after construction.

3
 4 The External Work Execution segment also includes the administration costs associated
 5 with managing external contractors who respond to outages and reactive calls. Since this
 6 function is shared with Toronto Hydro employees, costs may also be included in the
 7 Internal Work Execution segment depending on the responding crew. Consequently,
 8 there are slight year-over-year cost variations depending on the identity of the response
 9 crews.

10
 11 **5.2 External Work Execution Segment Costs**

12 Table 4, below, provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 13 Years (2025-2029) expenditures for the External Work Execution segment.

14
 15 **Table 4: External Work Execution Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
External Work Execution	1.0	1.5	1.1	1.2	1.4	1.5	1.6	1.7	1.8	1.8

16
 17 The costs for this segment can be separated into two categories:

- 18 • **Capital and Maintenance:** which includes the Program Support Office and
 19 Construction groups; and
- 20 • **Reactive Contractor Administration:** which covers the oversight of non-capital
 21 reactive work (e.g. digging a splice pit to access a failed cable). This budget is
 22 currently under the Internal Work Execution segment and is transferred annually
 23 to account for the external assistance for reactive work.

1 **5.3 External Work Execution Segment Year-over-Year Variance Analysis**

2 2020 – 2021 Variance Explanation

3 From 2020 to 2021 costs in this segment increased by \$0.5 million due to an increase in
4 work being performed by Toronto Hydro’s Energy Services affiliate.⁶ While costs incurred
5 appear in this program, they are recovered through the shared services program as set
6 out in Exhibit 4, Tab 5, Schedule 1.

7
8 2021– 2022 Variance Explanation

9 From 2021 to 2022, costs in this segment decreased by \$0.4 million. This is attributed to
10 a minor variance in oversight costs of external resources.

11
12 2022 – 2025 Variance Explanation

13 Between 2022 to 2025, costs in this segment are expected to increase by \$0.4 million or
14 an average of \$0.1 million per year due to:

- 15 • A return to baseline in oversight costs following the decrease in 2021;
- 16 • headcount increases to support an increasing capital program; and
- 17 • inflationary pressures.

18
19 2025 – 2029 Variance Explanation

20 Between 2025 and 2029 costs in this segment are expected to increase by \$0.3 million, or
21 an average of \$0.1 million per year to maintain the resourcing capacity and capabilities
22 required to support the increased volume and complexity of work discussed above. If
23 Toronto Hydro were forced to deliver this segment with a reduced level of funding over
24 the 2025-2029 rate period, the utility could face various legal compliance risks and
25 drawbacks, including:

⁶ Toronto Hydro Energy Services Inc.

- 1 • Execution risks relating to a reduced ability to perform capital and maintenance plans
2 due to a decrease in recruitment of field managers, engineers, project managers and
3 other staff;
- 4 • Decreased ability to meet legislated training targets, thereby exposing Toronto Hydro
5 to unnecessary safety and legal risk;
- 6 • Reduced productivity due to inadequate tools and equipment; and
- 7 • Increased risk of injury to employees resulting from the lack of requisite PPE, clothing
8 and equipment such as hard hats.

9

10 **6. INTERNAL WORK EXECUTION SEGMENT**

11 **6.1 Segment Description**

12 The Internal Work Execution segment includes the administrative support and training
13 costs associated with construction work performed by Toronto Hydro's internal
14 construction and design employees. Among the costs included in this segment are small
15 tools issuance, legislated training costs, including training costs associated with the
16 utility's Trade School, office-related expenditures, as well as time not directly attributable
17 to any specific capital program or project. This Program ensures that Toronto Hydro
18 employees are receiving legislated safety training and possess the requisite tools and PPE
19 to perform their roles in a safe and financially responsible manner.

20

21 **6.1.1 Safety Training**

22 As described in detail in the Human Resources, Environment and Safety program,
23 employee health and safety are core values at Toronto Hydro.⁷ Underlying this
24 commitment is the extensive health and safety awareness and training work conducted
25 throughout the year. Toronto Hydro certified tradespersons and apprentices participate

⁷ Exhibit 4, Tab 2, Schedule 15.

1 in an average of over 8.6 days of health and safety training per year. The training is aimed
 2 at providing employees with the tools and knowledge to perform their work safely and
 3 efficiently, thereby maximizing the value of their work for the utility and its customers.

4
 5 In addition, due to the complexity of Toronto Hydro’s distribution system and the number
 6 of legacy assets that are largely unique to the utility (e.g. paper-insulated lead-covered
 7 cable), apprentices are required to complete several years of theoretical and practical
 8 training to gain the skills and knowledge required to safely work on Toronto Hydro’s
 9 distribution system.

10
 11 **6.1.2 Apprenticeships**

12 The Internal Work Execution segment also includes a portion of (non-capitalized)
 13 expenditures associated with capital construction work performed by Toronto Hydro’s
 14 skilled trades’ apprentices. Certified and skilled trades are critical resources in the
 15 execution of Toronto Hydro’s capital and maintenance programs. Over time, Toronto
 16 Hydro has strengthened the workforce to prepare for retirements and unplanned exits as
 17 necessary, and allow for the extended lead-time required to safely train new workforce
 18 entrants (apprentice programs run from 4.5 to 6.5 years in length).

19
 20 **6.2 Internal Work Execution Segment Costs**

21 Table 5, below, provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 22 Years (2025-2029) expenditures for the Internal Work Execution segment.

23
 24 **Table 5: Internal Work Execution Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Internal Work Execution	10.0	12.7	16.2	13.1	13.8	14.5	15.2	16.2	16.7	17.6

1 The variances are largely attributable to a staged approach to safely absorb and integrate
2 almost 40 individuals to the apprenticeship program during the 2025-2029 timeframe.
3 This approach will facilitate workforce renewal in a safe and effective manner without
4 jeopardizing the utility's objectives or ability to safely and effectively deliver its capital
5 and maintenance work programs.

6

7 **6.3 Internal Work Execution Segment Year-over-Year Variance Analysis**

8 2020 – 2021 Variance Explanation

9 Between 2020 and 2021, costs in this segment increased by \$2.7 million due to an
10 increase in headcount in the apprentice program, and increased payroll costs due to
11 increased sick time.

12

13 2021 – 2022 Variance Explanation

14 Between 2021 and 2022, costs in this segment increased by \$3.5 million due to an
15 increase in operational costs due to a higher proportion of sick time compared to 2021 as
16 a result of the omicron wave of the COVID-19 pandemic. Also contributing to this increase
17 is an increase in the apprentice program, as well as an increase in tool repair, PPE and
18 other consumables.

19

20 2022 – 2025 Variance Explanation

21 Between 2022 to 2025, costs in this segment are expected to decrease by \$1.7 million, or
22 an average of \$0.6 million due to:

- 23 • A decrease in operational costs due to an anticipated return to pre-pandemic sick
24 time usage;

- 1 • better allocation of costs to other operations, maintenance and administration
- 2 programs (attributed to the transition to SAP), as well as a decrease in tool repair
- 3 and PPE costs; and
- 4 • This decrease was partially offset by an increase in the headcount to support an
- 5 increasing capital program, and inflationary pressures.
- 6 •

7 2025 – 2029 Variance Explanation

8 Between 2025 and 2029 costs in this segment are expected to increase by \$3.1 million, or

9 an average of \$0.8 million per year, to maintain the resourcing capacity and capabilities

10 required to support the increased volume and complexity of work discussed above. If

11 Toronto Hydro were forced to deliver this segment with a reduced level of funding over

12 the 2025-2029 rate period, the utility could face various legal compliance risks and

13 drawbacks, including:

- 14 • Decreased ability to meet legislated training targets, thereby exposing Toronto Hydro
- 15 to unnecessary safety and legal risk;
- 16 • Reduced productivity due to inadequate tools and equipment;
- 17 • Increased risk of injury to employees and the public resulting from the lack of requisite
- 18 PPE, clothing and equipment such as pylons, barriers, and hard hats; and
- 19 • Execution risk relating to a reduced ability to perform capital and maintenance plans
- 20 due to lack of support and decrease in recruitment of skilled tradespeople.

1 **FLEET AND EQUIPMENT SERVICES**

2

3 **1. OVERVIEW**

4 **Table 1: Fleet and Equipment Services Program Summary**

Fleet and Equipment Program Summary									
Outcomes: Operational Effectiveness - Reliability, Environment, Operational Effectiveness - Safety, Financial Performance									
Segments:									
<ul style="list-style-type: none"> Fleet and Equipment Services 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
9.3	8.5	7.8	8.7	9.1	9.3	9.6	9.8	10.0	10.3

5

6 Toronto Hydro’s Fleet and Equipment Services program (the “Program”) governs the
 7 utility’s vehicle and equipment procurement, operation, maintenance, and disposal
 8 policies. The primary objective of the Program is to ensure that the utility’s vehicle assets
 9 and equipment operate safely and reliably at the lowest overall lifecycle cost. To achieve
 10 this objective, the Program delivers the services required to maintain Toronto Hydro’s
 11 456 vehicle fleet. The Program continues the activities described in Toronto Hydro’s 2020-
 12 2024 Rate Application Fleet and Equipment Services program. The Program’s services
 13 ensure that ensures that fleet vehicles are available so that the utility can carry out its
 14 electricity distribution activities and meet customer expectations in a safe, reliable, and
 15 expedient manner.

16

17 The activities administered by this Program are closely governed by legislative and
 18 regulatory requirements such as those administered by the Ministry of Transportation
 19 (the “MTO”), the Electrical Utility Safety Rules (“EUSR”), and the *Occupational Health and*

1 *Safety Act, 1990* (Ontario) (“OHSA”).¹ The majority of the Program’s activities are
 2 mandatory to meet these legislative and regulatory obligations and must be carried out
 3 by certified trade technicians.

4

5 **2. OUTCOMES AND MEASURES**

6 **Table 2: Fleet and Equipment Services Program Outcomes and Measures Summary**

Operational Effectiveness - Reliability	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s system reliability objectives (e.g. SAIDI, SAIFI, FESI-7) by: <ul style="list-style-type: none"> ○ Helping to ensure work crews have access to appropriate and sufficient vehicles and equipment to perform distribution work when required; and ○ Ensuring that the fleet and equipment are in good working order and assets are replaced before critical equipment failures arise that necessitate lengthy and costly offsite repairs.
Environment	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s environmental objectives by aiming to reduce greenhouse gas (“GHG”) emissions associated with fleet fuel consumption by: <ul style="list-style-type: none"> ○ Utilizing hybrid and electric vehicles and biofuels where possible; and ○ Implementing proactive mitigation measures such as anti-idling technology, GPS reporting to drive best practices for driver behaviour, and the use of biofuels.²
Operational Effectiveness - Safety	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s safety objectives as measured by metrics like Total Recordable Injury Frequency (“TRIF”) by helping to ensure employees are working safely with minimal exposure to hazards by completing vehicle and equipment (e.g. personal protective equipment) safety inspections.

¹ R.S.O. 1900, c. O.1. [*“Occupational Health and Safety Act”*].

² The use of technology to drive these results is constrained by funding and classes of vehicles where the return on investment is justifiable.

Financial Performance	<ul style="list-style-type: none">• Contributes to Toronto Hydro’s financial performance objectives as measured by the total cost and efficiency measures by:<ul style="list-style-type: none">○ Managing fleet and equipment assets to the lowest overall lifecycle costs; and○ Mitigating fuel expenses by aiming to reduce fuel consumption through a combination of utilizing hybrid and electric vehicles; anti-idling technologies; and optimizing vehicle lifespans in accordance with the utility’s asset management strategy.
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3. PROGRAM DESCRIPTION

The successful execution of the Program’s activities enables Toronto Hydro to maintain a safe and reliable fleet that is capable of meeting the utility’s safety, reliability and customer service objectives. Activities to fulfill the Program’s objectives include:

- Managing the lifecycle of Toronto Hydro’s vehicle and equipment assets
- Administering a preventative vehicle maintenance program in accordance with MTO requirements and original equipment manufacturers’ (“OEM”) guidelines
- Equipping vehicles with the necessary onboard equipment that is optimized to align with each vehicle type. This equipment includes ruggedized laptop mounts, truck grounds, air rescue kits, safety retrieval lines, and telematics systems. This equipment enables fleet operators to perform their duties safely, efficiently, and with minimized wear and tear on vehicles.
- Employing technologies to reduce engine wear and idle time
- Work required to manage vehicle and equipment asset lifecycles, and to test related safety equipment, including executing competitive bids for equipment assets and related services such as fuelling, telematics, washing, lab testing and onboard technology services, and

- 1 • Managing contracts and vendors and employing skilled fleet mechanics. Toronto
2 Hydro’s fleet mechanics hold a number of specialized licenses and certifications
3 that enable them to perform repairs on utility equipment.
4

5 All vehicles, regardless of power source, are part of regular preventative maintenance
6 inspections according to each vehicle’s class. Additional reactive maintenance costs may
7 arise at undetermined times and the cost is generally comparable between electric
8 vehicles and internal combustion engine vehicles. The primary difference in repair costs
9 between the two types of vehicles is attributable to potential major repairs. Toronto
10 Hydro factors in these types of repairs into its asset lifecycle analysis, which accounts for
11 the degradation of major vehicle components and the expiry of warranties on major parts
12 such as batteries.
13

14 The Program’s activities are also aimed towards reducing Toronto Hydro’s scope 1
15 greenhouse gas emissions to achieve Net Zero by 2040, as detailed in Exhibit 2B, Section
16 D6. Sample activities to this end include maintaining equipment to reduce engine idle
17 time and wear in compliance with engine idling reduction by-laws,³ and using
18 maintenance measures to optimize the fuel efficiency of the utility’s internal combustion
19 engine (ICE) vehicles. Finally, the Program employs the services of technicians capable of
20 maintaining and repairing both hybrid and electric vehicles, enabling the utility to
21 maintain its growing complement of low-emissions fleet vehicles.
22

23 The Program also governs the administration of services provided by a third-party lab
24 certified by North American Independent Laboratories. This lab acquires, certifies, and
25 tests the safety tools, implements, and employee personal protective equipment (“PPE”)

³ Toronto Municipal Code, Chapter 517, Idling of Vehicles and Boats.

1 that are mandated by law for utility work. Defective or insufficient safety equipment risks
2 exposing workers to electrocution and to harmful gases within vaults and cable chambers.
3 The faults or failure of this equipment could also compromise grid integrity, thereby
4 reducing the reliability of Toronto Hydro's distribution system. The use of this third-party
5 service provider enables the utility to receive these services as the demand arises without
6 the costs and logistical challenges of continually maintaining skilled staff and
7 infrastructure in-house.

8

9 Toronto Hydro also outsources non-core maintenance work to qualified third-party
10 service providers if the work meets the following criteria:

- 11 • The work entails greater physical safety risks, such as vehicle suspension work;
- 12 • The work does not require the technical expertise of a licensed mechanic, such as
13 tire replacement;
- 14 • The work requires specific skills or credentials that Toronto Hydro employees do
15 not possess and which may be sourced through a third-party service provider,
16 such as aerial lift dielectric testing; or
- 17 • The work uses equipment not owned by, or not readily accessible by the utility,
18 such as vehicle emissions testing equipment.

19

20 Toronto Hydro outsources generic maintenance work to free up its in-house mechanics'
21 time for skilled monthly maintenance work. This enables the utility to allocate high value
22 and specialized work to its internal employees while ensuring that intermittent work that
23 can be easily contracted out to market is completed at optimum efficiency and cost.

1 **4. PROGRAM COSTS**

2 Toronto Hydro is requesting an average of \$9.8 million over the 2025-2029 period to
 3 efficiently execute the functions in the Fleet and Equipment Services program. The
 4 Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-2029) expenditures for
 5 the program are summarized in Table 3 below. Program costs have remained fairly stable
 6 since the last rebasing period.

7

8 **Table 3: Fleet and Equipment Services Program Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Fleet and Equipment Services	9.3	8.5	7.8	8.7	9.1	9.3	9.6	9.8	10.0	10.3
Total	9.3	8.5	7.8	8.7	9.1	9.3	9.6	9.8	10.0	10.3

9

10 The Program costs cover the labour, parts, services, and fuel attributable to the core
 11 Program functions. The labour costs also involve the services of third-party technicians
 12 who maintain, repair, and test all capital assets within the Program (such as vehicles,
 13 equipment, and safety tools). The volume and pace of the program’s activities, as well as
 14 the testing requirements, are influenced by several factors such as applicable legislative
 15 and regulatory requirements, and the size and condition of the utility’s fleet. Toronto
 16 Hydro must complete repairs to equipment in a timely and periodic manner to ensure
 17 that vehicles are safe for operators and the public, and test safety tools in a continuous
 18 fashion to protect field employees on the job.

19

20 The Program also includes the costs for fuelling, parts, tools, licences, and insurance
 21 associated with the operation, maintenance, and repair of fleet equipment and with
 22 safety programs. These costs are non-discretionary and are required for continued
 23 operations under the Program. Other operating costs include compensation for the

1 Program's managers and employees, who perform a variety of functions including but not
2 limited to, advising on vehicle conditions, administering the centralized vehicle pool, and
3 advising on standard vehicle selections for optimal safety and technical functionality at
4 the lowest available cost.

5

6 To manage the costs under the Program, as detailed below under subsection 4.2 Cost
7 Control and Productivity Measures, Toronto Hydro has invested in fuel-saving
8 technologies and opts for electric and hybrid vehicles, where possible, to further save on
9 fuel and engine-related maintenance costs. The utility also decreased its overall fleet size
10 from 588 vehicles in 2017 to 456 in 2023, which reduced the Program's maintenance,
11 repair, and administrative costs.

12

13 **4.1 Cost Control and Productivity Measures**

14 **4.1.1 Cost Management**

- 15 • **Elimination of Under-Utilized Vehicles:** Toronto Hydro optimizes its fleet size on
16 an ongoing basis, as discussed in detail in Exhibit 2B, Section E8.3, Fleet and
17 Equipment Services (capital). Over the past two rate periods, the utility eliminated
18 some costly and specialized vehicles and equipment that were expensive to repair
19 and where the relevant services could be obtained through outsourcing (e.g: cable
20 trucks and forestry units). Each vehicle reduction results in cost savings by
21 eliminating the need for associated maintenance, repair, licensing, insurance, and
22 fuel costs. On average, each vehicle removed from the fleet reduces operating
23 costs by \$2,000 to \$7,000 per year. Since 2017, Toronto Hydro's fleet size has
24 decreased by 132 vehicles (a net 22 percent reduction).
- 25 • **Fuel Consumption Reduction:** The Program has also achieved an average annual
26 reduction in fuel needs (estimated to be approximately 20,000 litres per year) as

1 a result of replacing internal combustion engine vehicles with hybrid and fully
2 electric vehicles, in accordance with Toronto Hydro's Decarbonization Strategy
3 discussed in Exhibit 2B, Section D6 and the Fleet and Equipment Services (capital)
4 program discussed in Exhibit 2B, Section E8.3, which contributes to lower fuel
5 costs.

- 6 • **Optimization of Vehicle Services:** In 2020, Toronto Hydro eliminated costs
7 attributed to truck-to-truck fuelling services and selected a more cost-competitive
8 mobile wash vendor, which collectively resulted in an annual savings of
9 approximately \$0.25 million.
- 10 • **Repair Avoidance:** Toronto Hydro has begun a ten-year corrosion prevention pilot
11 project with 18 pickup trucks that were put into service in 2020. The goal of this
12 project is to determine the best form of corrosion protection to minimize repair
13 and replacement costs by extending the life of the vehicles. The pilot includes
14 testing three forms of protection on six vehicles each: (1) a single base protection
15 application of initial oil-based rust inhibitor spray, (2) a single base protection
16 application of initial oil-based rust inhibitor spray plus the installation of a rust
17 inhibitor module, and (3) a single base protection application of initial oil-based
18 rust inhibitor spray plus an annual application of oil-based rust inhibitor spray.
19 Toronto Hydro's aim is to increase the age vehicles can reliably remain in the fleet,
20 as corrosion to critical components of units are one of the primary factors leading
21 to vehicle replacements.
- 22 • **Optimization of Program Resources:** The Program's employees improve
23 processes, evaluate service agreements, and make ongoing adjustments where
24 cost savings can be realized without increasing labour requirements. Specific
25 examples include: (i) utilizing GPS data for daily reporting on engine issues to
26 proactively reduce breakdowns and towing; ii) continually evaluating the capacity

1 of internal resources and determining the appropriate approach to optimize their
2 utilization; and iii) shifting work to externally sourced services where deemed
3 appropriate (in accordance with capacity, specialization, or cost effectiveness
4 needs).

- 5 • **Driver Safety Reporting:** From 2018 onwards, Toronto Hydro has leveraged driver
6 safety reporting on speeding, harsh braking, and reversing from parked position
7 to influence improvements in driver safety behaviour, and thus help minimize
8 safety incidents and resulting repair costs. Thanks to these measures, from 2020
9 to 2022 the number of speeding infractions has decreased by approximately 174
10 percent.

11 12 **4.1.2 Productivity**

13 The Program proactively monitors and manages vehicle utilization by continuously
14 evaluating the optimal usage of different types of vehicles according to operational needs
15 and work volumes. For example, vehicles that are not required for dedicated uses by field
16 crews are allocated to a centralized vehicle pool for shared use across the utility.
17 Specialized equipment, such as dump trucks, derricks with augers, and specially equipped
18 trailers are allocated to the pool to eliminate the redundancy that would otherwise result
19 from several crews relying on dedicated use of a particular piece of equipment. For more
20 information on Toronto Hydro's fleet vehicle utilization statistics, please refer to Exhibit
21 2B, Section E8.3.

22 23 **4.2 Fleet and Equipment Services Program Year-over-Year Variance Analysis**

24 2020 – 2021 Variance Explanation

25 From 2020 to 2021, costs decreased by \$0.8 million. This variance is comprised from:

- 26 • Payroll savings of \$1.2 million due to significant attrition; and

- 1 • An increase in external contractor services of \$0.4 million to support the
2 decreased capacity.

3

4 2021 – 2022 Variance Explanation

5 From 2021 to 2022, costs decreased by \$0.7 million. This variance is comprised from:

- 6 • Continued vehicle reductions that occurred throughout 2021 and 2022, resulting
7 in lower operating and repair costs.

8

9 2022 – 2025 Variance Explanation

10 From 2022 to 2025, costs are expected to increase by \$1.5 million. This variance is
11 comprised from:

- 12 • Increased headcount and payroll costs due to an increase in hiring mechanics to
13 adequately manage the necessary demands of vehicle repairs within the fleet.
14 • As well, a larger than average number of vehicles were commissioned at this time
15 requiring support from external service providers.

16

17 2025-2029 Variance Explanation

18 Between 2025 and 2029, costs in this segment are expected to increase by \$1 million, or
19 an average of \$0.3 million per year. Without the requested funding, Toronto Hydro faces
20 the following risks:

- 21 • Reduced ability to procure all parts, services, and fuel required for proper vehicle
22 functionality, which could result in vehicle downtime, impaired ability to perform
23 distribution work, and potentially prolonged outages;
24 • Reduction in the frequency, scope, and timeliness of vehicle maintenance work,
25 resulting in undetected faults and potential employee and public safety risks, as
26 well as inefficiencies in asset lifecycle management;

- 1 • Reduced ability to provide constant availability of certified and tested safety
2 implements and PPE that are required by law;
- 3 • Inability to implement technologies and programs that would yield sustained
4 reductions in GHG emissions and compliance with idling by-laws;
- 5 • Reduced ability to perform management functions related to the continuous
6 monitoring of and compliance with legislative and regulatory requirements; and
- 7 • Increases in costly and complex vehicle and equipment faults as a result of
8 reduced labour capacity to perform routine maintenance.

1 **FACILITIES MANAGEMENT**

2

3 **1. OVERVIEW**

4 **Table 1: Facilities Management Program Summary**

Facilities Management Program Summary									
Outcomes: Operational Effectiveness - Reliability, Public Policy Responsiveness, Environment, Operational Effectiveness - Safety, and Financial Performance									
Segments:									
<ul style="list-style-type: none"> • Facilities Maintenance Services • Rentals & Leases • Utilities & Communications • Property Taxes 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
24.3	26.0	25.0	26.0	27.9	27.9	28.4	28.9	29.6	30.3

5

6 Toronto Hydro’s Facilities Management program (the “Program”) delivers the workspace
 7 and property management services that enable the utility’s employees to perform their
 8 work in optimally configured, safe, and structurally sound surroundings. The Program
 9 aims to maintain the utility’s facilities in good working order and in compliance with
 10 applicable legislation and regulations. The Program is comprised of the following four
 11 segments:

12

- 13 • **Facilities Maintenance Services:** Work directed at maintaining the utility’s
 14 facilities in good working order and in compliance with applicable legislation and
 15 regulations;
- 16 • **Rentals & Leases:** The costs associated with Toronto Hydro’s leasehold
 17 agreements, including short-term equipment needs;

1 • **Utilities & Communications:** Enabling technologies that allow Toronto Hydro to
 2 run and operate its facilities; and

3 • **Property Taxes:** Municipal taxes on the value of property held by Toronto Hydro.

4 The Program and its constituent segments are a continuation of the activities described
 5 in the Facilities Management program in Toronto Hydro’s 2020-2024 Rate Application.¹

6

7 **2. OUTCOMES AND MEASURES**

8 **Table 2: Facilities Management Program Outcomes and Measures Summary**

<p>Operational Effectiveness – Reliability</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s system reliability objectives (e.g. SAIDI, SAIFI, FESI-7) by: <ul style="list-style-type: none"> ○ Complying with the applicable legislative and regulatory requirements for key assets in work centres and distribution system facilities (e.g. lifting devices, overhead doors, dock levellers, etc.); and ○ Maintaining building systems and elements that secure and mitigate the risk of damage to critical infrastructure (e.g. sump pumps, building envelopes).
<p>Public Policy Responsiveness</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s public policy responsiveness objectives by ensuring compliance with applicable regulatory and legislative requirements such as the Ontario Energy Board’s Cyber Security Framework² by: <ul style="list-style-type: none"> ○ Leading the implementation, maintenance and continuous lifecycle management of modern commercial security systems and technology in partnership with security subject matter experts and in alignment with enterprise risk assessments; ○ Applying security management policies and procedures across all Toronto Hydro sites; and ○ Maintaining the physical security measures that help safeguard sensitive or confidential personal or system

¹ EB-2018-0165, Exhibit 4, Tab 2, Schedule 11.

² EB-2016-0032, *Cyber Security Framework to Protect Access to Electronic Operating Devices and Business Information Systems within Ontario’s Non-Bulk Power Assets*.

	<p>information through measures that prevent unauthorized physical access to work centres, stations, and job sites.</p>
<p>Environment</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s environmental objectives by: <ul style="list-style-type: none"> ○ Supporting the achievement of goals outlined in Toronto Hydro’s Net Zero 2040 Strategy in Exhibit 2B, Section D6 by reducing greenhouse gas emissions. (E.g. through the use of more energy efficient HVAC and lighting fixtures); and ○ Conducting annual waste audits and monthly diversion reports which help Toronto Hydro comply with requirements of the <i>Waste Reduction and Waste Audit Work Plans</i> (O. Reg. 102/94),³ and maintain the <i>ISO 14001</i> certification for environmental management.
<p>Operational Effectiveness – Safety</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s safety objectives, measured through metrics such as the Total Recordable Injury Frequency (“TRIF”) by: <ul style="list-style-type: none"> ○ Ensuring compliance with the Ontario Building Code⁴ and the Ontario Fire Code⁵; ○ Repairing deficiencies which may cause safety (e.g. trip and fall) hazards; ○ Addressing legacy structural deficiencies such as the absence of secondary exits, non-compliant stairs, and inaccessible doors along pathways; ○ Improving internal lighting conditions and repairing external damaged lighting in work areas; ○ Implementing measures to minimize the risk of unauthorized access into Toronto Hydro’s work centres and stations; ○ Maintaining <i>ISO 45001</i> certification for Occupational Health and Safety Management using the Program’s maintenance management system; and ○ Conducting Designated Substance Surveys, required under the <i>Occupational Health and Safety Act, 1990</i>,⁶ which help identify and dispose of designated substances (e.g. asbestos, lead, etc.).

³ *Waste Reduction and Waste Audit Work Plans*, Ontario Regulation 102/94.

⁴ Ontario Building Code, Ontario Regulation 332/12.

⁵ Ontario Fire Code, Ontario Regulation 213/07.

⁶ R.S.O 1990, c. O.1. [*“Occupational Health and Safety Act”*].

Financial Performance	<ul style="list-style-type: none">• Contributes to Toronto Hydro’s financial performance objectives through the utility’s total cost and efficiency measures by:<ul style="list-style-type: none">○ Utilizing detailed asset condition assessments in order to efficiently manage assets in accordance with the utility’s Facilities Asset Management Strategy⁷ and replace assets that are at their end of life or in poor condition;○ Undertaking security enhancements at work centres and stations facing the highest level of need and risk;○ Prioritizing preventative maintenance actions for end of life assets in poor condition to mitigate against costly reactive repairs;○ Deterring theft and vandalism through the installation and usage of enhanced security systems;○ Utilizing benchmarking data (e.g. by the Building Owners and Managers Association (“BOMA”)) to optimize the space utilization of existing buildings and facilities and control maintenance and utility costs; and○ Reducing utility costs at Toronto Hydro’s work centres through energy efficient HVAC and lighting systems.
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1

2 **3. PROGRAM DESCRIPTION**

3 As of 2023, Toronto Hydro owns or operates 205 sites. The condition of these buildings
4 and stations varies widely and their age ranges from historic sites covered by heritage
5 property requirements to new buildings. Each Toronto Hydro property has unique
6 features and considerations that drive its maintenance and service requirements. These
7 include applicable legislative and regulatory requirements on safety, accessibility,
8 emergency preparedness, and environmental protection, Toronto Hydro’s own
9 environmental, health, and safety policies, and the needs of the distribution system. The
10 Program’s activities are categorized into the following four segments: (i) Facilities
11 Maintenance Services; (ii) Rentals & Leases; (iii) Utilities & Communication; and (iv)
12 Property Taxes.

⁷ Exhibit 2B, Section D5.

1 **4. PROGRAM COSTS**

2 In 2025 Toronto Hydro requires \$27.9 million in rate funding for the Facilities
 3 Management program, which represents an increase of \$3.6 million over the last Custom
 4 Incentive Risk Application in 2020. When normalized for shared services recoveries
 5 outlined in Exhibit 4, Tab 5, Schedule 1, the expected increase in this program is \$3.8
 6 million.

7
 8 Over the 2025-2029 rate period, the utility expects the cost of this program to increase
 9 by annual growth rate of 2.0 percent which is necessary to address the program needs
 10 and deliver the customers outcomes enabled by this program

11
 12 The Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-2029) expenditures
 13 for each of the Program’s segments are summarized in Table 3 below.

14
 15 **Table 3: Facilities Management Program Expenditures by Segment (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Facilities Maintenance Services	16.6	18.4	17.4	18.0	19.6	19.4	19.8	20.1	20.6	21.0
Rentals & Leases	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
Utilities & Communications	2.3	2.2	2.1	2.3	2.4	2.5	2.5	2.6	2.6	2.7
Property Taxes	5.0	4.9	5.0	5.2	5.4	5.5	5.6	5.7	5.8	6.0
Total	24.3	26.0	25.0	26.0	27.9	27.9	28.4	28.9	29.6	30.3

16
 17 **4.1 Cost Control and Productivity Measures**

18 Toronto Hydro uses the following tools and initiatives to control overall Program costs:

- 19
 20 • **Real Estate Management:** Toronto Hydro employs a data-driven framework for
 21 making real property investments and managing owned properties in a manner

1 that is responsive to the utility’s forecasted distribution and load-demand needs
2 in relation to its current capacity. The utility strategically makes investments to
3 support the utility’s critical functions and goals of grid reliability and resiliency and
4 divests properties that are deemed to be no longer used or useful for distribution
5 purposes. Refer to Exhibit 2B, Section D6 for a discussion of these approaches
6 under the umbrella of Toronto Hydro’s Facilities Asset Management Strategy.

- 7
- 8 • **Hybrid Maintenance Approach:** Toronto Hydro uses a combination of internal
9 resources and a third-party service provider to execute a cost-effective facilities
10 maintenance approach. This approach balances preventative maintenance and
11 run-to-fail strategies. Preventative maintenance is scaled up or down to optimize
12 the lifecycle of an asset depending on its cost and ease of replacement. This is
13 done through a hybrid approach by augmenting the internal team with third-party
14 service providers acting as a single source of support. The utility modifies service
15 modes, services, and maintenance routines as required through change order
16 management. This allows the internal team to focus on stakeholder management,
17 strategy, and the alignment of the Program to core business activities.

- 18
- 19 • **Performance Benchmarking:** Toronto Hydro leverages parametric data it obtains
20 from various industry resources such as the Building Owners and Managers
21 Association (“BOMA”) and International Facilities Management Association
22 (“IFMA”) to improve the utility’s operating efficiency. Toronto Hydro studies data
23 from the regional industry reports to measure the cost per square-foot of key
24 facilities management functions and benchmarking data retrieved from the
25 Energy Star Portfolio Manager. The utility uses this information to measure and
26 track its energy and water consumption against other commercial and

1 institutional buildings, analyze its performance and make recommendations for
2 improvements to areas such as energy and utilities conservation. Toronto Hydro
3 also utilizes the five-level BOMA BEST certification program and assessment
4 framework to improve environmental performance. To date, three sites have
5 been enrolled in the program, and their certifications are shown below.

6
7 **Table 4: Toronto Hydro Sites – BOMA Certification**

Toronto Hydro Site	Certification Level	Score
71 Rexdale	Gold	80-90 percent
715 Milner	Gold	80-90 percent
500 Commissioners	Silver	50-79 percent

- 8
- 9 • **Data Driven Decision Making:** Toronto Hydro uses a computerized maintenance
10 management system (“CMMS”) that manages, tracks and schedules maintenance
11 work. The CMMS, in conjunction with departmental performance measures such
12 as the On-Time in Full (“OTIF”) metric that steers the completion criteria for tenant
13 requests, enables Toronto Hydro to maximize the effectiveness of its maintenance
14 resource dispatching strategy. The CMMS provides users with a range of functions
15 that display new, existing, and historical work orders for repair, maintenance,
16 cleaning, and external grounds segments and for each work centre, and track the
17 resources allocated to a given activity or segment.
 - 18
 - 19 • **Competitive Procurement:** Given its hybrid maintenance approach, Toronto
20 Hydro routinely solicits bids to maintain the currency of its key service contracts.
21 This process introduces competition and offers the utility a venue for negotiation,
22 which facilitates cost control.

1 **5. FACILITIES MAINTENANCE SERVICES SEGMENT**

2 **5.1 Segment Description**

3 The purposes of the Facilities Maintenance Segment are a) to provide Toronto Hydro's
4 employees with a safe work environment that encourages the effective and efficient
5 execution of their duties, and b) to ensure that the utility's properties, buildings, and
6 stations are structurally sound and safe for employees and the public. The Facilities
7 Maintenance Segment is driven by legislative and regulatory requirements, internal
8 environment, health and safety policies, building and asset condition reports, and
9 industry best practices. This segment governs a broad range of daily, monthly, and annual
10 maintenance activities including all the necessary tasks and services to maintain the
11 offices, work centres and buildings housing the utility's transformer and municipal
12 stations ("TS" and "MS", respectively). Toronto Hydro's attention to regular preventative
13 maintenance of its office buildings, work centres, and stations contributes to the utility's
14 safety record.

15

16 If the utility were to fail to comply with applicable legislative and regulatory requirements,
17 temporary equipment lock-outs and fines could be imposed, leading to costly
18 interruptions in the utility's business activities that impact distribution customers.

19

20 As described in section 3.2.2, Toronto Hydro relies on a combination of internal resources
21 and a third-party service provider to execute the Program functions. This arrangement
22 allows Toronto Hydro to react to issues rapidly and scale its service model to changing
23 needs or strategies.

24

25 Toronto Hydro's maintenance strategy applies a balance of preventative maintenance
26 and run-to-fail strategies. Run-to-fail strategies are used to manage low impact and low-

1 cost equipment that have readily available parts or replacements, and where
2 preventative work would not be cost-effective. The level of preventative maintenance is
3 predicated by asset criticality, cost and system complexity (i.e. special orders, long lead
4 times, etc.), which justify the recurring lifecycle costs. Balancing the two methods keeps
5 vital building systems operating while enabling technicians' capacity for proactive and
6 reactive work. Even the most robust preventative maintenance routine will require
7 reactive work as a by-product. Toronto Hydro's approach balances the upfront cost and
8 monitors the degree of reactive work to ensure critical tasks are manageable for its
9 complement of internal and external trades. Through the CMMS, the utility applies this
10 maintenance approach by tracking and scheduling the following maintenance activities:

11

12 **Preventative Maintenance:** Routine inspections and tasks to ensure that equipment,
13 systems, and their respective components are fully operational. This includes activities
14 such as the periodic inspections of facilities assets (e.g. magnetic locks on emergency exits
15 to prevent unauthorized entry and release when a fire alarm is activated). If the frequency
16 of Toronto Hydro's maintenance activities were to fail to meet manufacturer
17 recommended schedules and regulated maintenance standards, the utility could
18 experience premature failures, locked-out equipment, potential fines (e.g. by the
19 Technical Standards and Safety Authority), and unsafe work conditions.

20

21 **Corrective Maintenance:** Through routine preventative inspections, Toronto Hydro
22 identifies the systems and equipment requiring corrective work, ensuring that any
23 malfunctions are proactively rectified. For example, a blower motor bearing noise may be
24 heard during HVAC maintenance and would indicate a pending failure. Logging a
25 corrective work order when this noise is heard permits timely replacement before the
26 unit fails and contributes to the air quality in work centres and other facilities.

1 **Reactive Maintenance:** Toronto Hydro employs reactive maintenance strategies to
2 address specific issues that are observed from time to time through various reports and
3 requests. Program employees, other employees, and contractors all contribute to the
4 effort of flagging failures, near misses, and related observations in the field. Despite the
5 utility's effective preventative maintenance program, reactive work is a recurring element
6 of the Program driven by run-to-fail assets, external factors (e.g. extreme weather,
7 property damage), and a deferred maintenance backlog (e.g. work deferred due to
8 budget constraints). The deferred maintenance backlog represents real-time deficiencies
9 in the field that at the time of diagnosis were deemed less critical (i.e. postponed repairs),
10 but could deteriorate to the point of unplanned asset failure or impacted building
11 functionality. The decision to defer work is the result of budget constraints, which means
12 deficiencies are evaluated based on system criticality, building functionality, safety,
13 tenant comfort, etc. This is a repetitive process that compares incoming work orders to
14 the deferred maintenance backlog to manage the budget. Furthermore, the utility uses
15 an industry metric called the Facilities Condition Index (FCI) to evaluate, monitor, and
16 project the level of in-field deficiencies. The FCI represents the ratio of the estimated
17 value of deferred maintenance to the replacement value of the respective assets.
18 Therefore, it relates the predicted impact of planned capital to the allocated operational
19 expenditures. Figure 1 shows the mix of FCI scores by building age. The colour represents
20 the classification of the condition.

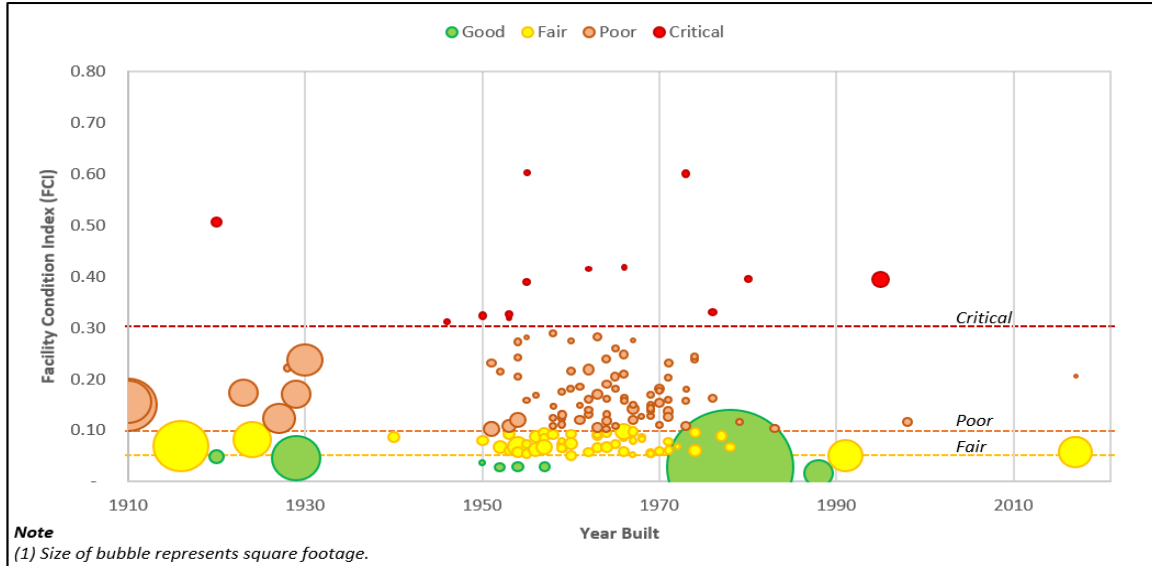
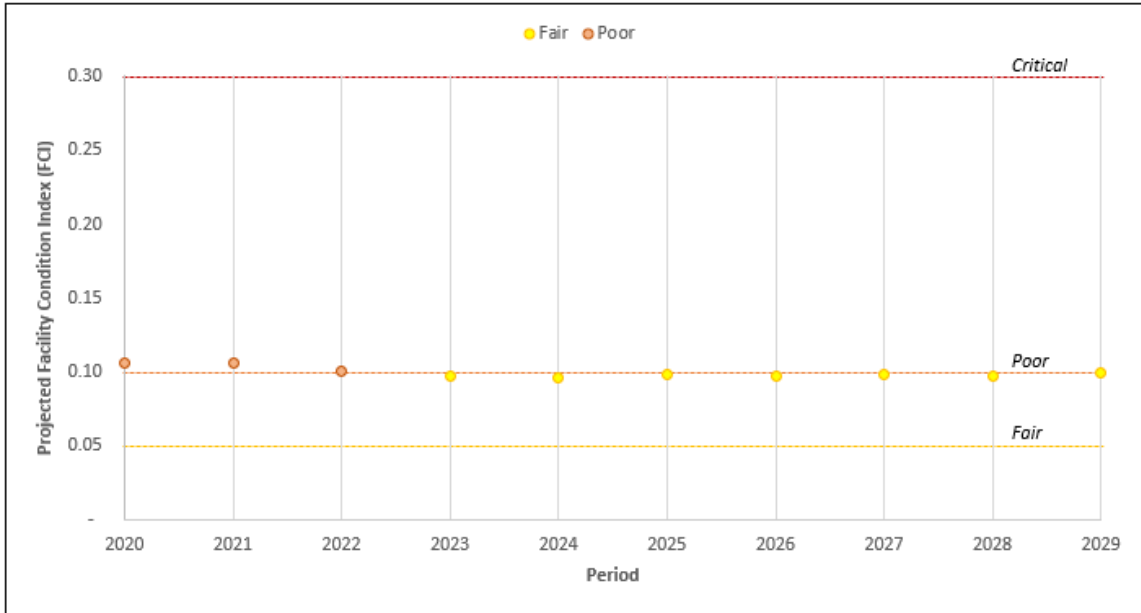


Figure 1: Current State of the Facilities Condition Index ("FCI")

1
2
3
4
5
6

Using the FCI allows for the monitoring and projection of the index score by accounting for the utility's planned operational and capital investments. Therefore, Toronto Hydro is able to predict and control the level of deficiency that it experiences period over period as seen in Figure 2.



1 **Figure 2: Current and Projected State of the Consolidated Facilities Condition Index**
 2 **("FCI")**

3
 4 The utility anticipates that it will sustain the current consolidated FCI level around the
 5 'Fair-Poor' threshold for the duration of the 2025-2029 rate period through a combination
 6 of the operational expenditures for the Facilities Maintenance Services Segment
 7 discussed in Section 4.2 below and the planned capital investments discussed in Exhibit
 8 2B, Section E8.2.

9
 10 **5.2 Facilities Maintenance Services Segment Costs**

11 Table 5 below provides the Historical (2020-2022), Bridge (2023-2024) and Forecast Years
 12 (2025-2029) expenditures for the Facilities Maintenance Services Segment. These costs
 13 include both internal and external work, vehicle costs for travel between sites, and other
 14 related expenses, driven by the factors discussed above under subsection 3.1.1.

5.2.1 Facilities Maintenance Services Segment Cost Control Measures

Through competitive procurement, the Program reduced the base cost of its hybrid maintenance approach described in section 3.2.2 by applying lessons learned from previous vendor contracts and better customizing scopes of work for the third-party service providers in accordance with the utility’s property and business needs. The reduction of base contract costs enabled the allocation of more funds to reactive and deferred maintenance while controlling the growth of the overall Program. This is further outlined in the 2021-2022 variance description of the segment found at section 4.3.

Table 5: Facilities Maintenance Services Segment Expenditures (\$ Millions)

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Facilities Maintenance Services	16.6	18.4	17.4	18.0	19.6	19.4	19.8	20.1	20.6	21.0

5.3 Facilities Maintenance Services Segment Year-over-Year Variance Analysis

2020 – 2021 Variance Explanation

The \$1.8 million increase from 2020 to 2021 is attributable to:

- A \$1.5 million increase resulting from a combination of corrective and reactive maintenance activities. This increase in maintenance activities was driven by the need to address the increasing age of assets and the backlog of deferred maintenance which grew due to the slowdown of work during the COVID-19 pandemic; and
- A \$0.3 million increase resulting from inflationary pressures on contractual agreements, reactive maintenance (i.e. material and service pricing), and compensation increases.

1 2021 – 2022 Variance Explanation

2 The \$1 million decrease from 2021 to 2022 is attributable to:

- 3 • Contract management related to a new RFP; and
- 4 • Offsetting inflationary pressures.

5

6 2022 – 2025 Variance Explanation

7 The \$2 million increase from 2022 to 2025 is attributable to:

- 8 • A \$0.2 million decrease in operational cost drivers, corresponding to capital
9 investment in the 2023 period;
- 10 • A 0.3 million decrease to adjust investments to sustain facilities assets in
11 alignment with the Fair-Poor threshold of the consolidated FCI and management
12 of the deferred maintenance backlog;
- 13 • An increase of \$1.7 million to address an increased emphasis on security
14 equipment maintenance and strategy due to increased criminal activity (e.g. cable
15 thefts, trespassing, vandalism, etc.); and access control availability for system
16 reliability and response;
- 17 • An increase of \$0.8 million dollars in headcount and compensation to support
18 increased capabilities to perform a higher complexity of work;
- 19 • The go-live of functional operations at Toronto Hydro's second control room;⁸ and
- 20 • Inflationary pressures.

⁸ From the completion of the Control Operations Reinforcement program in Exhibit 2B, Section E8.1 of Toronto Hydro's 2020-2024 Custom Incentive Rate Application (EB-2018-0165). See also Exhibit 2B, Section E4 of this application.

1 2025-2029 Variance Explanation

2 Between 2025 and 2029 costs in this segment are expected to increase by \$1.6 million, or
3 an average of \$0.4 million per year. Without the requested funding over the upcoming
4 rate period, Toronto Hydro faces the following risks:

- 5 • Costly business interruptions caused by fines, penalties, and equipment lockouts
6 for non-compliance with applicable legislative and regulatory requirements;
- 7 • Deferred maintenance that compromises building envelope integrity and puts at
8 risk the functioning of critical distribution assets, jeopardizing the reliability of the
9 utility's key systems;
- 10 • Physical security threats and vulnerabilities (e.g. theft, trespassing, vandalism) due
11 to the inability to maintain security equipment such as the video management and
12 access control systems;
- 13 • Diminished productivity resulting from malfunctioning or unavailable assets and
14 other pending repairs that put the utility's office safety, office ergonomics, and air
15 quality initiatives at risk; and
- 16 • Employee and public safety risks resulting from deteriorating assets, inadequate
17 response times, and deferred maintenance that fails to identify and rectify in a
18 timely manner safety issues or equipment malfunctions.

19

20 **6. Rentals & Leases Segment**

21 **6.1 Segment Description**

22 The utility's rentals and leases expenditures are driven by electrical distribution assets
23 located within transmission corridors and on private lands. Furthermore, many of the
24 joint tenancy agreements are with other utilities, which maximises the utility of the
25 properties.

1 **6.2 Rentals & Leases Segment Costs**

2 Table 7 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast Year
 3 (2025-2029) expenditures for the Rentals and Leases segment.

4
 5 **6.2.1 Rentals and Leases Segment Cost Control Measures**

6 Toronto Hydro minimizes costs within this segment by routinely reassessing agreements
 7 for distribution related leases. This strategy focuses on delineating space usage and
 8 holding partners to fair market value (“FMV”) when Toronto Hydro is the lessor.

9
 10 **Table 7: Rentals & Leases Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Rentals & Leases	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6

11
 12 **6.3 Rentals & Leases Segment Year-over-Year Variance Analysis**

13 Variance Year-Over-Year Explanation

14 The primary driver of variances is the amendment of long-standing agreements with
 15 different utilities and agencies (e.g. Hydro One, City of Toronto, Toronto Community
 16 Housing Corporation) that expire and require renewal. As some of these agreements date
 17 back more than 20 years, at time of renewal, renegotiation with the landlords typically
 18 results in the utility’s costs increasing to FMV.

19
 20 2025-2029 Variance Explanation:

21 Between 2025 and 2029 costs in this segment are expected to increase by \$0.1 million.
 22 Without the requested funding over the upcoming rate period, Toronto Hydro would face
 23 the following risk:

- An inability to pay for rentals and leases, diminishing the utility’s ability to obtain access to real property and equipment and impeding operational effectiveness.

7. Utilities & Communications Segment

7.1 Segment Description

The Utilities & Communications segment includes the costs of providing water, electricity, natural gas, and related services to Toronto Hydro’s office buildings, work centres, and stations. The utility’s costs for this segment are primarily driven by the prescribed costs charged by various service providers. Additional drivers of year-over-year cost variances are weather fluctuations, such as extremely hot summers that increase electricity consumption or cooler-than-normal winters that result in higher heating expenditures.

Toronto Hydro works to manage its costs by promoting conservation and improving the energy efficiency of its facilities. To facilitate consistent implementation of energy efficiency standards, Toronto Hydro developed standards that outline the relevant energy, water, and gas efficiency criteria for the utility’s new and renovated work spaces. The utility routinely reviews and amends these standards are to align with emerging conditions and corporate objectives such as the utility’s Net Zero 2040 Strategy.⁹ Examples of decarbonization actions by Toronto Hydro include the conversion to energy efficiency lighting, the implementation of building automation system (“BAS”) controls for new space build-out, and retrofitting activities for corrective maintenance when feasible.

To support the utility’s goal to reach Net Zero by 2040 by reducing scope 1 greenhouse gas (“GHG”) emissions, Toronto Hydro also continues to integrate and revise the

⁹ Exhibit 2B, Section D6.

1 programming for its legacy HVAC units to reduce energy consumption of its existing
 2 equipment. For more information on the capital investments in fuel switching Toronto
 3 Hydro is making to support this goal, please refer to the Facilities Management & Security
 4 capital program in Exhibit 2B, Section E8.2.

5

6 **7.2 Utilities and Communications Segment Costs**

7 Table 9 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast Year
 8 (2025-2029) expenditures relating to Utilities and Communications.

9

10 **7.2.1 Utilities and Telecommunication Segment Cost Control Measures**

11 To mitigate energy costs, Toronto Hydro is using BAS integration and programming to
 12 improve the electricity, natural gas, and water consumption efficiency of the utility’s
 13 legacy equipment. These efficiency gains directly support the utility’s Net Zero by 2040
 14 goal by reducing the utility’s associated scope 1 GHG emissions.

15

16 **Table 9: Utilities and Communications Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Utilities & Communications	2.3	2.2	2.1	2.3	2.4	2.5	2.5	2.6	2.6	2.7

17

18 **7.3 Utilities and Communications Segment Year-over-Year Variance Analysis**

19 2020 – 2021 Variance Explanation

20 The \$0.1 million decrease from 2020 to 2021 was attributable to:

- 21 • Low building occupancy during the COVID-19 pandemic reducing overall HVAC
 22 load.

1 2021 – 2022 Variance Explanation

2 The \$0.1 million decrease from 2021 to 2022 was attributable to:

- 3 • Continuing to integrate legacy HVAC equipment into the BAS to improve efficiency
4 as part of Toronto Hydro's Net Zero 2040 Strategy.

5

6 2022 – 2025 Variance Explanation

7 Between 2022 and 2025, costs in this segment are expected to increase by \$0.4 million or
8 an average of \$0.1 million per year. This increase is attributable to:

- 9 • Increases in costs attributable to building occupancy due to the adoption of hybrid
10 work at Toronto Hydro's work centres as of July 2022 and inflationary pressures;
11 • Continued enhancement of the BAS controls and optimization of the BAS
12 programming to hybrid work trends;
13 • Continued enhancement of the BAS controls; and
14 • Impacts from fuel switching, and offsetting efficiency gains from asset
15 replacements related to Toronto Hydro's Net Zero by 2040 Strategy.

16

17 2025-2029 Variance Explanation:

18 Between 2025 and 2029 costs in this segment are expected to increase by \$0.2 million, or
19 an average of \$0.1 million per year. Without the requested funding over the upcoming
20 rate period, Toronto Hydro faces:

- 21 • An inability to pay for utility and communications services, resulting in
22 productivity losses.

1 **8. Property Taxes Segment**

2 **8.1 Segment Description**

3 Property taxes are calculated based on the amount of the property owned by Toronto
 4 Hydro, in accordance with municipal tax rates and any applicable credits. With more than
 5 5,000,000 square feet of property in the City of Toronto, property taxes are a significant
 6 expense for the utility. Historically, Toronto Hydro’s property taxes have increased at the
 7 rate of inflation and a similar trend is expected to continue through the 2025-2029 rate
 8 period, which is reflected in the utility’s forecasts.

10 **8.2 Property Taxes Segment Costs**

11 Table 11 below provides the Historical (2020-2022), Bridge (2023-2024) and Forecast
 12 Years (2025-2029) expenditures relating to Property Taxes.

14 **Table 11: Property Taxes Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Property Taxes	5.0	4.9	5.0	5.2	5.4	5.5	5.6	5.7	5.8	6.0

16 **8.3 Property Taxes Segment Year-over-Year Variance Analysis**

17 2020 – 2021 Variance Explanation

18 The \$0.1 million decrease from 2020 to 2021 was attributable to:

- 19 • The sale of one property; and
- 20 • Tax cap adjustments for two work centres.

22 2021-2022 Variance Explanation

23 The \$0.1 million increase from 2021-2022 was attributable to municipal property
 24 assessments and inflationary escalation.

1 2022-2025 Variance Explanation

2 Between 2022 and 2025, costs in this segment are expected to increase by \$0.5 million,
3 or an average of \$0.2 million per year due to municipal property assessments and
4 inflationary escalation

5

6 2025-2029 Variance Explanation

7 Between 2025 and 2029 costs in this segment are expected to increase by \$0.5 million, or
8 an average of \$0.1 million per year. Without this level of funding for this segment over
9 the upcoming rate period, Toronto Hydro faces:

- 10 • An inability to pay property taxes in full and on time, leading to higher costs due
11 to interest payments on deferred amounts and a deterioration of the utility's
12 relationship with the City of Toronto, affecting the overall viability of distribution
13 operations.

1 **SUPPLY CHAIN SERVICES**

2

3 **1. OVERVIEW**

4 **Table 1: Supply Chain Services Program Summary**

Supply Chain Program Summary									
Outcomes: Operational Effectiveness - Reliability, Environmental, Financial Performance									
Segments:									
<ul style="list-style-type: none"> Supply Chain Services 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
15.8	12.9	13.8	16.7	18.8	21.5	23.5	24.9	25.5	27.1

5

6 The Supply Chain Services program (the “Program”) provides procurement and
 7 warehousing activities that support the execution of Toronto Hydro’s capital and
 8 operating programs. The objectives of the Program are to facilitate timely and cost-
 9 effective acquisition of services, materials and equipment, maintain sufficient inventory
 10 to support uninterrupted work execution, and manage material handling costs. This
 11 Program is anticipated to grow significantly over the upcoming 2025-2029 rate period in
 12 order to facilitate the utility’s growth, modernization and sustainment investments, and
 13 fulfil its capital plan.

14

15 The Program consists of two interrelated functions: (i) Demand and Acquisition Services;
 16 and (ii) Warehouse and Logistics. The Demand and Acquisition Services function secures
 17 the requisite equipment, materials and services for Toronto Hydro within specified
 18 timelines and at an optimal cost. It also monitors vendor performance to ensure that the
 19 goods and services acquired are being delivered to Toronto Hydro in an efficient and
 20 effective manner. The Warehouse and Logistics function facilitates coordinated, cost-
 21 effective and timely receiving, stocking and distribution of materials and equipment

1 required to execute Toronto Hydro’s capital and maintenance work programs. The
 2 Program and its activities are a continuation of the Supply Chain Services program
 3 described in Toronto Hydro’s 2020-2024 rate application.¹

4

5 **2. OUTCOMES AND MEASURES**

6 **Table 2: Supply Chain Services Program Outcomes and Measures Summary**

Operational Effectiveness - Reliability	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s system reliability objectives (e.g. SAIDI, SAIFI, FESI-7) by: <ul style="list-style-type: none"> ○ Supporting the effective execution of capital and maintenance programs by fulfilling warehouse orders and fulfilling supplier deliveries; and ○ Supporting Toronto Hydro’s ability to respond to outages promptly and restore power through effective management of inventory.
Environment	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s environmental objectives by ensuring Toronto Hydro meets all Municipal, Provincial and Federal regulations related to managing hazardous materials by safely collecting, storing, and removing hazardous waste from work sites. • Supports Toronto Hydro’s decarbonization efforts by procuring materials and equipment (e.g. electric vehicles) with a view to reducing greenhouse gas emissions where possible and cost-effective
Financial Performance	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s financial performance objectives as measured by the total cost and efficiency measures by: <ul style="list-style-type: none"> ○ Implementing processes such as automating the disbursement of certain inventory stock and purchasing certain equipment directly from the manufacturer; and ○ Maintaining an optimal level of inventory of materials and equipment to support uninterrupted work execution with minimal carrying cost.

¹ EB-2018-0165, Exhibit 4A, Tab 2, Schedule 13.

1 **3. PROGRAM DESCRIPTION**

2 The Program is comprised of two interrelated functions: Demand and Acquisition
3 Services and Warehouse and Logistics, each of which are described in the sections below.

4
5 **3.1 Demand and Acquisition Services**

6 The Demand and Acquisition Services function supports Toronto Hydro's capital and
7 maintenance work programs, and enables the utility's day-to-day operations, by
8 providing the goods and services required to perform the work. The employees who
9 deliver this function require an extensive set of supply chain and electricity industry-
10 specific skills, including understanding of the competitive bid process, in-depth
11 knowledge of quantitative analysis and inventory management tools, familiarity with
12 changing electricity system equipment standards, and advanced negotiation and
13 communication skills.

14
15 *3.1.1 Procurement and Contract Management*

16 Demand and Acquisition Services' activities involve sourcing of reputable and reliable
17 suppliers, monitoring their performance to ensure that they meet their contractual
18 obligations, and generating the purchase orders that underlie each agreement. Working
19 with the various parts of the utility's operations, Demand and Acquisition Services leads
20 the competitive bid generation and evaluation processes, and conducts market trend
21 analysis to identify emerging industry trends and locate suitable suppliers.

22
23 Toronto Hydro's competitive bid selection process is based on pre-established selection
24 criteria that balance the quantitative and qualitative aspects of each desired proposal.
25 The proposals and the criteria are developed in collaboration with the internal business
26 units that require the goods or services in question.

1 After the supplier is chosen, Toronto Hydro negotiates the contract terms and conditions
2 relevant to the goods or services provided. Demand and Acquisition Services monitors
3 supplier performance through collaboration with other departments and regular
4 meetings with the supplier.

5

6 In 2021, Demand and Acquisition Services implemented an enhanced Contract
7 Management Framework (CMF). CMF is a set of guiding principles, documents,
8 procedures, and Management Control and Reporting System (MCRS) designed to govern
9 the end-to-end sourcing process. The framework is a part of the Contract Management
10 section of Demand and Acquisition Services' overall Supplier Relationship Management
11 Framework (SRM), as shown in Figure 1, below. The full SRM is in the process of
12 development and is expected to be fully executed by 2027.



13

Figure 1: Supplier Relationship Management Framework (SRM)

14

15 CMF allows proactive governance of active contracts while ensuring full compliance with
16 internal policies and contractual obligations. The implementation of CMF has enhanced
17 the Demand and Acquisition Services team's ability to:

- 1 • Engage business units more frequently to keep them up to date on contract spend,
2 which enables a proactive management approach;
- 3 • Immediately highlight violations to contract spend and contract data integrity
4 through implementation of KPIs, reporting, and short interval control;
- 5 • Better forecast and balance annual workload, which helps manage resource
6 constraints and reduce bottlenecks;
- 7 • Standardize training and data management approach to ensure process
8 consistency and data integrity; and
- 9 • Enhance visibility and increase alignment of aggregate data from SAP and Ariba.

10

11 The enhanced CMF has resulted in the following impacts from 2022 to 2023:

- 12 • Greater compliance with internal policies related to authorized spend amounts,
13 resulting in a 76% decrease in over-committed contracts;
- 14 • Improved proactive management of contracts to reduce compliance, legal, and
15 operational risks, resulting in an 84percent decrease in expired contracts;
- 16 • Improved purchase order management and reduced open liability, resulting in a
17 54 percent decrease in aging purchase order balances; and
- 18 • Increased alignment of aggregate data from SAP and Ariba, resulting in a 25
19 percent increase in data accuracy and integrity.

20

21 The outcome of the enhanced CMF contributes to improved contract management
22 practices, productivity and data integrity, and ensuring efficient procurements at the
23 most favourable acquisition cost.

1 *3.1.2 Material Requirements Planning*

2 The Demand and Acquisition Services function manages inventory levels in Toronto
3 Hydro's warehouses in support of the utility's capital and maintenance programs. This
4 involves reviewing historic use trends and known work projects to develop planned work
5 requirement forecasts and supplier orders.

6
7 In addition, Demand and Acquisition Services oversees materials and equipment
8 inventory for reactive work driven by adverse weather, system contingencies and other
9 unforeseen events. To facilitate efficient and expedient execution of reactive work,
10 Toronto Hydro establishes minimum and maximum inventory settings for each
11 warehouse location, and determines appropriate material re-order points and quantities
12 that trigger purchase order generation as inventories are gradually depleted. Toronto
13 Hydro maintains inventory levels by setting and regularly reviewing reorder points, which
14 consider historic demand, material lead time, service requirements, and critical spare
15 requirements. Late shipments that can affect available inventory for either planned or
16 reactive work are expedited with suppliers, and optimal delivery dates are ascertained
17 and communicated to warehouses and requesting areas of the utility.

18
19 Demand and Acquisition Services also works with other operational groups at Toronto
20 Hydro to identify certain materials and equipment that are critical to the ongoing
21 operation of the distribution network (e.g. various models and vintages of pad mounted
22 switchgear and transformers) and to introduce new technology and models of
23 equipment. Once critical materials are identified, these inventory items are flagged as
24 critical spares and segregated from general stock for specific use in reactive situations,
25 which ensures investment levels are sufficient to support system reliability. New
26 technology is researched thoroughly by subject matter experts to ensure compatibility

1 with the distribution network. Demand and Acquisition Services supports the rollout of
2 new technology and models of equipment by setting up stock codes and negotiating
3 contracts with suppliers to ensure favourable lead times and pricing are in place.

4
5 *3.1.3 Third-Party Procurement Provider*

6 Since 2015, Toronto Hydro has been using a Third-Party Procurement (“3PP”) provider to
7 complement internal resources and improve productivity. This approach:

- 8
- 9 • Reduces the overhead cost per purchase order;
 - 10 • Provides better operational cost certainty; and
 - 11 • Provides more operational flexibility to meet Toronto Hydro’s varying operational
12 requirements consisting of managing over 10,000 active inventory codes linked to
13 individual assets, issuing 32,000 purchase order lines, and executing 76
14 solicitations, averaged over 2020-2022.

15 The 3PP provider’s employees are now fully integrated and act as an extension of the core
16 Demand and Acquisition Services team by performing the full range of procurement and
17 vendor performance and inventory management activities. In 2022, the 3PP provider was
18 responsible for managing 96 percent of 10245 active inventory codes, issuing 97 percent
19 of 34656 purchase orders, and executing 97 percent of 79 solicitations annually. From
20 2020 to 2022, this represents an increase of 3 percent of active inventory codes, 32
21 percent of purchase orders, and 2 percent of solicitations managed by the 3PP provider.

22
23 The 3PP provider has demonstrated its ability to effectively adapt to Toronto Hydro’s
24 business processes and systems and work alongside other operational groups at Toronto
25 Hydro. The Demand and Acquisition Services team leveraged the competencies of the
26 3PP provider’s employees to expand their responsibilities to:

- 1 • Coordinate equipment repairs with repair and recertification suppliers and liaise
2 between suppliers and Toronto Hydro quality assurance engineers;
- 3 • Attend capital project planning meetings with other operational groups to provide
4 inputs related to material forecasts; and
- 5 • Support the product change committee with the introduction or change of stock
6 coded items used in Toronto Hydro's distribution system.

7

8 By complementing the core Demand and Acquisition Services team, the engagement of
9 the 3PP provider has resulted in the following productivity impacts from 2022 to 2023:

- 10 • Improved competitive sourcing turnaround times, resulting in a 64 percent
11 reduction in median business days between contract award to fully published
12 state; and
- 13 • Increased agility to process purchase orders, resulting in a 46 percent reduction in
14 purchase requisition to purchase order conversion days.

15

16 The integration and expansion of responsibilities of the 3PP provider has allowed the core
17 Demand and Acquisition Services team to focus on strategic endeavours to secure a
18 reliable supply of materials and equipment and mitigate supply chain challenges,
19 including:

- 20 • Implementing system enhancements and upgrades to enable better decision
21 making for forward buys and material demand planning;
- 22 • Optimizing inventory schedules with suppliers and improving and embedding
23 material demand planning across the organization;
- 24 • Conducting frequent short interval control meetings with operational leaders to
25 maintain visibility, provide status updates of expected deliveries, and prioritize
26 material allocations; and

- 1 • Creating critical asset forecasting models to anticipate, predict, and accommodate
2 market changes in real-time by implementing predictive forecasting.

3
4 3.1.4 *Response to Global Supply Chain Disruption*

5 Major world events in the 2020-2024 rate period, such as the COVID-19 pandemic,
6 changes to work patterns, geopolitical conflict, and high inflation, significantly disrupted
7 the global supply chain by adversely affecting manufacturing capacity and transportation
8 networks. These disruptions have caused a number of risks to materialize with respect to
9 the timely and cost-effective procurement of materials and equipment. As examples, the
10 lead times for acquiring certain items have significantly increased, requiring capital
11 projects to be planned further ahead of time. Higher raw material and labour costs have
12 put upward pressure on the price of materials. The timely delivery of orders has become
13 less reliable, requiring greater stock to ensure the availability of critical spares.
14 Collectively, all of these effects have increased the risk of materials shortages, with the
15 potential to adversely affect project schedules.

16
17 To mitigate these issues and ensure reliability of supply, Demand and Acquisition Services
18 updated its procurement strategy to incorporate a comprehensive assessment of supply
19 chain risks and address challenges with a combination of proactive, long-term measures
20 and reactive, short-term actions. The revised strategy adopts a 360-degree view of
21 Toronto Hydro's supply needs in the present and into the short- and medium-term, as
22 informed by engagements with business units, while simultaneously keeping track of
23 market conditions through touchpoints with vendors and manufacturers. In light of these
24 inputs, Demand and Acquisition Services has adopted an approach that focuses on 5
25 critical factors:

- 1 • **Product:** In order to increase resiliency against material constraints, Demand and
2 Acquisition Services conducts diligent reviews of alternative sources of supply and
3 alternative products for equipment, and negotiates forward buys with suppliers
4 for major components and materials in order to secure manufacturing slots with
5 factories ahead of time. Sharing known work projects and planned work
6 requirement forecasts with supplier partners more frequently and at longer time
7 horizons affirm supply plans and provisions. Demand and Acquisition services
8 prudently negotiate proposed price increases and structure supply and service
9 contracts to maintain a favourable position for Toronto Hydro.
- 10 • **Parameter:** Inventory parameters, including re-order points, lead times, and
11 critical spares, are strategically reviewed and adjusted to proactively respond to
12 changes in the demand forecast.
- 13 • **People:** Internal and outsourced resourcing are ramped up to increase flexibility
14 of the workforce and manage ongoing disruptions and challenges.
- 15 • **Program:** Internal business units are continuously engaged to provide status
16 updates on expected deliveries, prioritize material allocation for major assets, and
17 conduct material demand planning workshops for planned projects.
- 18 • **Process:** With respect to the governance of materially impactful price increases
19 and streamlining processes, additional due diligence procedures are implemented
20 and used to evaluate change requests and other procurement decisions.

21

22 Examples of achievements resulting from this strategy between 2020 to 2022 include:

- 23 • **Product:** In 2020, the Utility's primary transformer supplier advised that they were
24 not able to keep up with the demand due to global supply chain challenges. In
25 order to maintain a steady supply of critical assets to sustain the capital program,
26 Demand and Acquisition Services, along with Standards and Quality, diligently

1 sourced and approved two new suppliers to supply the equipment, with pricing in
2 line with market rates, and lead times 12 weeks shorter than the industry average
3 of 60 weeks. Detailed tests were conducted to ensure specifications meet
4 approved standards and that the transformers are compatible with existing
5 infrastructure. Furthermore, with respect to cable, the Utility's primary cable
6 supplier was faced with labour disruptions between 2021-2022 and the
7 unexpected loss of one of their copper suppliers in 2022 due to an incident at the
8 plant, which constrained their ability to supply and extended lead times. Demand
9 and Acquisitions Services worked closely with the supplier to ensure production
10 slots are allocated to the utility, increase communication in regards to production
11 and shipping statuses of existing commitments, and negotiate forward buys to
12 secure production slots for future demand ahead of lead time. In tandem, a
13 secondary cable supplier was sourced to minimize material disruptions and
14 establish forward buy agreements. This outcome successfully reduced the risk of
15 material shortage for planned capital and reactive work, and ensured critical
16 materials were on hand for emergency situations.

- 17
- 18 • **Parameter:** In 2022, Demand and Acquisition Services updated contract lead
19 times for major assets in SAP to reflect current vendor lead times for material
20 requirements planning. With global disruptions significantly effecting lead times,
21 it was necessary to adjust the lead times in the system to align with the current
22 macroeconomic environment. This outcome enables more accurate forecasting,
23 project planning, and re-order point calculation, and thus contribute to
24 strengthening the ability to manage and minimize the risk of material disruptions.

- 1 • **People:** In 2022, Demand and Acquisition Services put together a dedicated
2 demand planning team to work with execution business units on the alignment of
3 strategic project planning, forecasting and budgeting, and materials management
4 to enable balanced, dynamic, and choreographed execution and decision making.
5 This outcome enhances information sharing, establish greater control and
6 monitoring, and drives discussions for future state improvement opportunities to
7 further increase resiliency in Toronto Hydro’s supply chain.
8
- 9 • **Program:** In 2020, Demand and Acquisition Services sourced a supplementary
10 transformer supplier to ensure a steady supply of padmount and vault
11 transformers, which are major assets commonly used in the distribution system.
12 Internal business units were continuously engaged to provide status updates on
13 expected deliveries, and to shift projects into future periods when material will be
14 available. This outcome contributes to the sustainment of Toronto Hydro’s capital
15 program by providing an alternative source of supply of such equipment, and
16 ensuring project are planned with realistic and tangible inputs.
17
- 18 • **Process:** For critical network protectors and network protection accessories,
19 Demand and Acquisition Services negotiated a proposed price increase, driven by
20 material increases in raw material costs, that was approximately 43 percent lower
21 than the supplier’s originally requested increase. This outcome successfully
22 reduced the risk of equipment shortage for planned capital and reactive work
23 while limiting cost increases to a reasonable degree, and thus contributed to
24 Toronto Hydro’s system reliability outcomes.

1 3.1.5 *Procurement Consulting Services*

2 In 2023, Demand and Acquisition Service engaged a procurement consulting service
3 provider to conduct an analysis of Toronto Hydro’s Procurement Policy and to establish
4 an ongoing supply chain market intelligence and analytical reports for the continuous
5 improvement of the utility’s procurement practices. The consultant will be responsible
6 to:

- 7 • Assess policy performance in relation to industry peers (including public utilities)
8 and in relation to the latest best practices within the North American utility
9 industry;
- 10 • Develop gap analysis and provide specific recommendations on how to improve
11 the Procurement Policy to meet or exceed industry best practices;
- 12 • Review current supply chain environment within Toronto Hydro;
- 13 • Provide recommendations on the most appropriate areas for monitoring; and
- 14 • Develop and provide on an ongoing basis a standardized report with respect to
15 the above elements.

16

17 The resulting policy analysis and market intelligence reports will provide insights to
18 emerging opportunities and potential threats to the business to allow for better strategic
19 decision making and improved sourcing strategies, in conjunction with the approaches
20 outlined in Section 3.1.4, Response to Global Supply Chain Disruptions. These macro level
21 insights will enable Toronto Hydro to reduce and mitigate risks related to macroeconomic
22 factors such as inflation and price indices, supply chain constraints, and global trade
23 policies such as tariffs, duties, and sanctions. In turn, the utility’s risk mitigation measures
24 will allow it to better manage supply risks of critical materials and equipment and work
25 more efficiently with suppliers to identify and adopt innovative delivery practices.

1 **3.2 Warehouse and Logistics**

2 **3.2.1 Inventory Management**

3 The Warehousing and Logistics function receives, stocks, and supplies all inventory
4 materials in accordance with Toronto Hydro’s capital and operational program
5 requirements. Field crews receive the requisite equipment and materials from any of the
6 five warehouses which are strategically situated across the City.

7

8 The typical activities of the Warehousing and Logistics function includes:

- 9 • Unloading, visually inspecting, receiving, and storing materials and supplies from
10 vendor vehicles to issue to crews;
- 11 • Selecting, staging, and loading distribution equipment and materials onto fleet
12 vehicles to facilitate a quick exit from work centres at the beginning of each
13 workday;
- 14 • Delivering and distributing requisite materials to and from job sites and between
15 warehouses to facilitate faster and more efficient materials distribution;
- 16 • Issuing miscellaneous (over-the-counter) items such as tools, clothing and safety
17 equipment to ensure that field crews have the mandatory safety equipment and
18 necessary tools to perform work;
- 19 • Handling excess materials returned from the field upon work completion, such as
20 partial cable reels which can be re-entered into inventory and issued to other jobs;
- 21 • Arranging for field equipment set aside for repairs or replacement to be returned
22 to vendors and suppliers;
- 23 • Establishing and maintaining appropriate minimum and maximum inventory
24 levels at each warehouse to ensure that the appropriate product mix is available
25 to support the work performed by the crews of each work centre; and

- 1 • Performing daily inventory cycle count activities to ensure the accuracy of Toronto
2 Hydro’s financial reporting and recordkeeping, and reconcile physical inventory
3 on the shelf with records.
4

5 3.2.2 *Third-Party Logistics Provider*

6 Since 2013, Toronto Hydro has been using a Third-Party Logistics (“3PL”) warehousing
7 services provider to support the scale of its capital program in a flexible and sustainable
8 manner. The 3PL provider uses Toronto Hydro’s Warehouse Management System
9 (“WMS”) software and provides services at competitive market rates. This service is
10 competitively sourced. Utilizing a 3PL provider gives the utility the flexibility (across and
11 within rate periods) to quickly adjust to fluctuating inventory demands; such as those that
12 were experienced throughout the pandemic. In 3PL’s absence, Toronto Hydro would have
13 the responsibility and would need to assume the risk of investing in additional warehouse
14 space, equipment and resources to support a growing capital program.
15

16 The 3PL provider owns and operates two warehouses located just north of Toronto as an
17 addition to the three existing Toronto Hydro warehouses. While the 3PL provider has
18 assumed a significant portion of Toronto Hydro’s warehousing duties, the internal work
19 centres continue to play a key operational role by facilitating prompt materials issuance
20 to the crews departing from the three work centres, and facilitating timely response to
21 emergency response needs. Toronto Hydro crews are able to reach job sites faster by
22 being able to pick up materials from the warehouses across the City. This creates greater
23 efficiency and execution of planned work and faster power restoration during reactive
24 assignments.

1 **3.3 On-Cost**

2 The cost of Warehouse and Logistics function and a portion of the Demand and
 3 Acquisition Services function are recovered internally through the materials on-cost rate,
 4 which is applied to the value of the goods issued to crews for specific projects, and
 5 ultimately reflected in the projects' overall capital costs.²

6
 7 On-cost rates shown in Table 3 below reflect the historical rates over the previous 3-year
 8 actual period (2020-2022), bridge period (2023-2024) and forecast period (2025-2029).
 9 The increase in the on-cost rate is driven by increased throughput to support the growth
 10 in the capital project program in the forecast period, and the need for additional staff to
 11 support the material issuances.

12
 13 **Table 3: On-cost rates for 2023-2029**

Year	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
On-Cost Rate	12.0 %	10.5 %	10.0 %	13.1 %	13.3 %	13.2 %	13.6 %	13.8 %	14.5 %	14.9 %

14
 15 **4. PROGRAM COSTS**

16 Toronto Hydro is requesting an average of \$24.5 million per year over the 2025-2029 rate
 17 period to efficiently execute the Program functions described above.

18
 19 Table 4, below, provides the Actual (2020-2022), Bridge (2023-2024), and Forecast (2025-
 20 2029) expenditures for the Program.

² Toronto Hydro calculates the annual rate by dividing the applicable Program costs over the anticipated cost of materials supplying that year's capital and maintenance work program. The resulting rate (%) is then added to the materials charged to the capital and maintenance projects.

1 **Table 4: Supply Chain Services Program Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Supply Chain Services	15.8	12.9	13.8	16.7	18.8	21.5	23.5	24.9	25.5	27.1
Total	15.8	12.9	13.8	16.7	18.8	21.5	23.5	24.9	25.5	27.1

2

3 **4.1 Cost Drivers**

4 The cost increases in this program are primarily a result of:

- 5 • **Increase in requests for materials:** To meet the volume of materials and
 6 equipment required to fulfill Toronto Hydro’s capital program for the 2025-2029
 7 rate period, the Program anticipates a commensurate rise in costs. Program costs
 8 have a direct relationship with the amount of material movements required by
 9 the utility, which are tied to its capital investments. The Program will additionally
 10 require an increase in headcount in order to process material movements, and
 11 competitively bid for strategic projects.
- 12 • **Challenging procurement environment:** With increased volume in capital projects
 13 and a disrupted procurement environment requiring a greater degree of advanced
 14 planning, more resources are needed to process purchase orders, conduct
 15 efficient competitive sourcing at the most favourable acquisition cost, collaborate
 16 with business units, and mitigate material supply risks to support grid
 17 modernization and electrification initiatives.
- 18 • **Increase in payroll and labour costs:** Internal labour, responsible for monitoring,
 19 controlling, governance, and continuous improvement initiatives, will supplement
 20 the operational work executed by external labour. Warehouse and Logistics will
 21 increase its hiring in 2024 to support the growth in the capital program.
- 22 • **Engagement of procurement consulting services:** Toronto Hydro engaged a
 23 procurement consulting service provider to provide consulting services and

1 conduct a thorough review of Toronto Hydro’s Procurement Policy and establish
2 the delivery of ongoing supply chain market intelligence reports. The costs of the
3 service in 2023 include the initial analysis and development of the market
4 intelligence models, which will form the gap analysis and recommendation
5 development framework. Subsequent market intelligence reports in 2024-2026
6 will provide Toronto Hydro with recommendations on risk management strategies
7 to reduce risks related to macroeconomic factors, supply chain constraints, and
8 global policies. In the future, as Demand and Acquisition Services implements risk
9 and mitigation measures from the market intelligence reports, Toronto Hydro
10 expects cost savings through improved sourcing strategies.

11

12 **4.2 Cost Control and Productivity Measures**

13 In 2018, Toronto Hydro implemented SAP Ariba, a cloud-based procurement software,
14 which connects prospective suppliers with buyers on a single platform. SAP Ariba, which
15 is part of the SAP suite of applications, synchronizes seamlessly with Toronto Hydro’s
16 Enterprise Resource Planning (“ERP”) software.

17

18 In 2022, all of Demand and Acquisition Services’ sourcing activities are conducted through
19 SAP Ariba and have provided the following benefits to Toronto Hydro:

- 20 • **Collaboration and digital transformation:** SAP Ariba enhances Toronto Hydro’s
21 competitive bid process by bringing together prospective suppliers, buyers, and
22 internal business unit collaborators on a single platform. With a cloud-based
23 solution, SAP Ariba can be accessed from different locations. Toronto Hydro
24 leverages Ariba’s ability to share documents digitally and securely in the cloud,
25 which mitigates the need for physical movement and storage of documentation,
26 and allows for more efficient record keeping. Toronto Hydro’s investment in the

1 Ariba software has helped the company reduce the environmental impact of its
2 internal operations and create a collaborative digital environment for productivity
3 and growth.

- 4 • **Operational efficiency and compliance:** SAP Ariba compliments and enhances
5 Toronto Hydro’s Contract Management Framework, which is a set of guiding
6 principles, documents, and procedures designed to govern the end-to-end
7 sourcing process. SAP Ariba improves Toronto Hydro’s operational efficiency and
8 compliance through consolidation of data and documents, and increases visibility
9 on current engagements. SAP Ariba provides notifications to Demand and
10 Acquisition Services when contracts are within the defined notification period to
11 exercise option to renew. As a result, Toronto Hydro’s risk of engaging with a
12 supplier with an expired contract is greatly reduced.

13
14 Where materials and equipment at the end of their useful lives are replaced with
15 alternatives built to newer technical standards, Toronto Hydro ensures that the existing
16 stock of the obsolete parts are used up first to minimize any residual inventory. In certain
17 cases, Toronto Hydro may also return remaining quantities of the obsolete equipment to
18 the supplier, or sell them for parts. This approach ensures that warehouse storage space
19 is used efficiently and without impeding the adoption of new technologies or types of
20 equipment.

21
22 In order to further reduce Toronto Hydro’s carbon footprint and overall costs, major
23 assets such as transformers that were used for temporary connections or capital upgrades
24 go through Toronto Hydro’s Major Asset Equipment Reuse Program when they are
25 returned from the field. Engineers from the Quality and Compliance team inspect each
26 unit carefully, and if the unit is deemed fit for reuse, it is returned to stock and issued out

1 to the next capital project. If the unit can be repaired, it is sent back to the manufacturer
2 if it is under warranty, or sent to a third-party repair and recertification supplier for a
3 small fee. By reusing and recertifying the major assets, Toronto Hydro is able to reduce
4 the amount of waste generated and reduce the lead time and costs associated with
5 purchasing a new unit. To ensure sufficient capacity to inspect and certify transformers
6 for reuse, Toronto Hydro engaged an additional contractor in 2022 to execute this work
7 and proactively manage the eligibility criteria for assets' inclusion in this program. This
8 approach further mitigates supply risks.

9

10 Toronto Hydro will continue to manage costs in this Program by leveraging the 3PP
11 provider to:

- 12 • Diversify and balance workload between internal and outsourced resources to
13 increase flexibility and resiliency in the workforce; and
- 14 • Streamline operations through the 3PP provider, and reduce costs through the
15 vendor managed inventory initiative. Under this initiative, suppliers are
16 responsible for maintaining an appropriate level of inventory to ensure material
17 is always ready for pick up. Once an order is placed, inventory is transferred from
18 the vendor managed portion of the warehouse into the main warehouse. This
19 reduces lead time and provides cost savings by engaging suppliers directly instead
20 of distributors.

21

22 Toronto Hydro will continue to manage costs in this Program by leveraging the
23 procurement consulting services provider for assessing its policies, identifying best
24 practices and developing market intelligence monitoring, including macroeconomic
25 trends and category-specific trend analysis. The trend analysis will specifically:

- 1 • Compare Toronto Hydro’s Procurement Policy with similar organizations in the
2 utilities sector, and identify leading practices and areas of improvement;
- 3 • Identify components and subcomponents for key spending categories and risks
4 that can affect supply; and
- 5 • Create a template for market intelligence monitoring containing macroeconomic
6 trends and category-specific trend analysis.

7

8 Toronto Hydro will also continue to manage costs in this Program by leveraging the 3PL
9 provider to:

- 10 • The WMS software and hardware solutions utilize barcode technology and
11 provide real-time visibility into inventory, increasing the efficiency of the receiving
12 and picking functions. Warehouse transactions are centrally prioritized and
13 assigned to warehouse employees by queuing tasks to the employees’ hand-held
14 barcode guns. Tasks such as receiving, picking, and cycle counting are carried out
15 by scanning the product bar code affixed to all incoming materials. This
16 technology significantly speeds up the previously manual tasks of keying in the
17 entries for every incoming packing slip, outgoing picking slip, or cycle count entry.
18 The use of this technology allows the warehouse to provide efficient service to
19 Toronto Hydro crews.
- 20 • In 2023, the Warehouse and Logistics function is going to upgrade its WMS to the
21 SAP Warehouse Management Module, which allows full integration with the
22 Toronto Hydro’s ERP system by SAP. This outcome will reduce the likelihood of
23 data errors and inefficiencies that may result from the use of separate WMS and
24 ERP systems, facilitate reporting and recordkeeping, and consequently reduce
25 operational costs.

1 As shown in Figure 2 below, despite challenges presenting themselves in the last three
 2 years, the Warehouse and Logistics function successfully fulfilled material requirements
 3 On Time and in Full (“OTIF”) at an average rate of 95 percent since Jan 2020. This is
 4 consistent with our fulfilment performance in the previous rate period.



5 **Figure 2: Warehouse OTIF Rate**

6
 7 **4.3 Supply Chain Services Program Year-over-Year Variance Analysis**

8 2020 – 2021 Variance Explanation

9 The Program experienced a \$2.8 million decrease from 2020 to 2021. This decline was
 10 due to the following factors:

- 11 • a \$1.9 million decrease in labour related expenses due to retirement in the
 12 workforce;
- 13 • a \$2.0 million decrease in inventory and direct purchases due to a variance of \$1.4
 14 million in inventory written off in 2021 versus 2020 resulting from revised

- 1 standards and obsolete materials, and \$0.6 million in on-cost true-down caused
2 by a lower on-cost recovery rate in 2021;
- 3 • a \$0.1 million reduction of office supply purchases due to a remote environment
4 driven by COVID;
 - 5 • a \$0.8 million increase driven by 3PL and 3PP costs as a result of increased material
6 throughput; and
 - 7 • a \$0.4 million increase in other support costs driven real inventory write offs in
8 2021 resulting from obsolete materials.

9
10 2021 – 2022 Variance Explanation

11 The Program experienced a \$0.9 million increase from 2021 to 2022. This increase was
12 due to the following factors:

- 13 • a \$1.9 million increase driven by 3PL and 3PP costs as a result of increased material
14 throughput;
- 15 • a \$1.6 million decrease in inventory and direct purchases
- 16 • a \$0.4 million in inventory written off in 2022 versus 2021 resulting from revised
17 standards and obsolete materials, and \$1.1 million on-cost variance true up
18 caused by a higher on-cost recovery rate in 2022 versus 2021
- 19 • a \$0.4 million increase in labour related expenses due to compensation and salary
20 inflationary increases;
- 21 • a \$0.1 million increase of purchases related to office supplies due a hybrid return-
22 to-office environment; and
- 23 • a \$0.1 million credit related to volume purchasing rebates in 2022 for pole line
24 hardware.

1 2022 – 2025 Variance Explanation

2 The Program is expected to experience a \$7.7 million increase from 2022 to 2025. This
3 increase is due to the following factors:

- 4 • a \$2.7 million increase in labour related expenses due to additional resources
5 required to support material demand planning and strategic sourcing initiatives,
6 and compensation and salary inflationary increases;
- 7 • a \$0.6 million increase in inventory direct purchases due to materials written off
8 resulting from revised standards and obsolete materials;
- 9 • a \$4.6 million increase driven external contract costs of due to a \$3.8 million
10 increase in 3PL and 3PP costs as a result of an increase in projected material
11 throughput and expected costs from new contract setting process, and a \$0.8
12 million increase driven by procurement consulting services to conduct a review of
13 Toronto Hydro's Procurement Policy and establish the delivery of ongoing supply
14 chain market intelligence reports;
- 15 • a \$0.1 million increase of purchases related to office supplies due a hybrid return-
16 to-office environment; and
- 17 • a \$0.2 million decrease in other support costs due to a variance caused by material
18 volume rebates not yet materializing in the latter periods.

19

20 2025 – 2029 Variance Explanation

21 Between 2025 and 2029 costs in this segment are expected to increase by \$5.6 million, or
22 an average of \$1.4 million per year Without the requested level of funding over the
23 upcoming rate period, Toronto Hydro could be exposed to a number of risks, including:

- 24 • Delayed or inefficient procurement of goods, which could affect the timely
25 completion of planned and reactive capital work as well as operations, leading to

- 1 worse reliability outcomes for customers and delays in the achievement of other
2 outcomes;
- 3 • Delayed or inefficient procurement of services, which could affect the cost of
4 third-party resources and increase overall operating costs; and
 - 5 • Errors in inventory management, such as equipment and materials being
6 misplaced, issued incorrectly, or damaged, increasing overall operating costs and
7 delaying the execution of capital programs and customer connections.

1 **CUSTOMER CARE**

2

3 **1. OVERVIEW**

4 **Table 1: Customer Care Program Summary**

Customer Care Program									
Outcomes: Customer Focus, Public Policy Responsiveness, and Financial Performance									
Segments:									
<ul style="list-style-type: none"> • Billing, Remittance, and Meter Data Management • Collections • Customer Relationship Management 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
55.7	39.3	39.3	44.9	48.4	48.6	51.6	52.5	54.4	56.1

5

6 The Customer Care program (the “Program”) addresses the direct interactions between
 7 Toronto Hydro and its approximately 791,000 customers, through customer relationship
 8 management, billing, metering, and collections functions. Providing high-quality
 9 customer service is a core priority for Toronto Hydro, and the utility is constantly seeking
 10 new ways to foster meaningful two-way communication, expand the range of service
 11 offerings to meet customers’ evolving needs, improve service convenience and
 12 experience, and integrate new technological advancements to drive improvement and
 13 productivity.

14

15 The Program is comprised of the following three segments: (i) Billing, Remittance, and
 16 Meter Data Management, which handles the reading of customer meters, upkeep
 17 associated with infrastructure and metering data management, preparation of customer
 18 bills, and payment processing; (ii) Collections, which handles all activities associated with

1 unpaid accounts; and (iii) Customer Relationship Management, which involves activities
2 related to customer interactions.

3

4 The Program and its constituent segments are a continuation of the activities described
5 in the Customer Care program in Toronto Hydro’s 2020-2024 Rate Application.¹ Adequate
6 funding for the Program is essential to the utility’s ability to provide timely, effective, and
7 efficient customer services, remain financially viable, and contribute to the billing and
8 settlement of pass-through rates and charges that relate to other stakeholders in the
9 electricity industry. Over the 2025-2029 rate period, Toronto Hydro also expects that it
10 will need to continuously evolve its business practices and service offerings to adapt to
11 broad societal developments and industry trends affecting its business and customers’
12 needs and preferences, such as new public policies, electrification, and increased
13 adoption of electric vehicles (“EVs”) and distributed energy resources (“DERs”). These
14 transformations will likely lead to numerous changes in customer expectations, including,
15 demands for greater information on and control over electricity usage and expenditures,
16 greater choice to purchase renewable power or self-generate for sale back to the grid,
17 and the incorporation of environmental, social, and governance (“ESG”) goals in energy
18 use.

19

20 Although it remains to be seen how and to what extent these industry trends, public
21 policy changes, and changes in customers’ preferences and behaviours will impact the
22 Program’s operational areas and key performance metrics such as call volumes, average
23 service times, metering, billing, and remittance, Toronto Hydro needs to be well-poised
24 to adapt to these uncertain circumstances. The 2025-2029 rate period will be crucial for
25 the utility to lay the foundation for such adaptation by continuously monitoring trends,

¹ EB-2018-0165, Exhibit 4A, Tab 2, Schedule 14.

1 modifying its business processes, achieving productivity gains through initiatives such as
2 automation, upskilling its workforce, and acquiring additional specialized resources.
3 Investing in these measures will allow the Program to remain agile and effectively meet
4 customers' needs under any scenario that may occur.

5

6 Toronto Hydro's proposed investments in the Program over the 2025-2029 rate period
7 include the following to enable the utility's effective response to the related new
8 demands and challenges:

- 9 • Contact Centre services designed to respond to new types and complexities of
10 technical, metering, and billing enquiries associated with EVs and EV charging
11 systems, DERs, and government programs and incentives;
- 12 • Enhancements to improve the customer experience and two-way communication
13 through more flexible channels such as online chat, mobile application and digital
14 self-service platforms;²
- 15 • Metering solutions associated with net metering and remote metering;
- 16 • Billing options including provincial pricing plans or utility-specific options;
- 17 • Remittance processing including support for new and emerging payment
18 methods, and for public and private EV charging systems;
- 19 • Data analytics resources including staff, business processes, and technology to
20 help capture a holistic view of customers' individual needs, preferences, and past
21 interactions to offer personalized service and allow proactive engagements;
- 22 • Information and support resources to facilitate eligible customers' access to
23 financial assistance programs, including the improvements discussed under the
24 Charitable Donations and Low-Income Energy Assistance Program;³

² Exhibit 2B, Section E8.4; and Exhibit 4, Tab 2, Schedule 17.

³ Exhibit 4, Tab 2, Schedule 19.

- 1 • Enhanced collections services and capabilities including increased self-service
- 2 functionality, multi-channel communications and proactive notifications to
- 3 support customers with on-time payments; and
- 4 • Efficiency improvements through chatbots, virtual assistants, and other
- 5 automation tools to handle routine inquiries and exception handling, based upon
- 6 artificial intelligence-powered tools to analyze customer interactions and identify
- 7 areas for improvement.⁴

8

9 **2. OUTCOMES AND MEASURES**

Table 2: Customer Care Program Outcomes and Measures Summary

Customer Focus	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s customer focus outcomes over the 2025-2029 rate period by: <ul style="list-style-type: none"> ○ Answering telephone calls within 30 seconds at least 65 percent of the time on average, as measured by the OEB’s Telephone Accessibility metric; ○ Providing written responses to qualified enquiries within ten business days at least 80 percent of the time on average, as measured by the OEB’s Written Response to Enquiries metric; ○ Addressing customers’ needs in the first instance they contact Toronto Hydro, as measured by the OEB’s First Contact Resolution measure; ○ Achieving a billing accuracy rate of at least 98 percent, as measured by the OEB’s Billing Accuracy metric; ○ Increasing the adoption of electronic billing to a total of approximately 488,000 customers, representing cumulative savings of approximately \$2.0 million by the end of the 2025-2029 rate period; ○ Meeting or exceeding the OEB’s Reconnection Standards of 85 percent; and ○ Ensuring no more than ten percent of calls are abandoned, as measured by the OEB’s Telephone Call Abandon Rate.
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⁴ Exhibit 2B, Section E8.4. and Exhibit 4, Tab 2, Schedule 19.

Public Policy Responsiveness	<ul style="list-style-type: none"> Contributes to Toronto Hydro’s public policy responsiveness outcomes by implementing legislative and regulatory requirements within mandated timelines over the 2025-2029 rate period.
Financial Performance	<ul style="list-style-type: none"> Contributes to Toronto Hydro’s financial performance outcomes as measured by the total cost and efficiency metrics by: <ul style="list-style-type: none"> Ensuring financial stability and revenue generation capabilities via timely issuance of customers’ bills and the collection and processing of customers’ payments; and Investing in process improvements that eliminate manual efforts and promote customer self-service.

1

2 **3. PROGRAM DESCRIPTION**

3 The Program is composed of three segments covering most of the direct interactions
 4 between Toronto Hydro and its customers, and the work required to support these
 5 interactions:

- 6 • **Billing, Remittance, and Meter Data Management:** Involves the reading of
 7 customer meters, upkeep of the associated metering infrastructure, management
 8 of meter data, preparation of customers’ bills, and the processing of customer
 9 payments;
- 10 • **Collections:** Involves activities to collect money associated with unpaid customer
 11 accounts; and
- 12 • **Customer Relationship Management:** Involves activities related to Toronto
 13 Hydro’s interactions with its customers.⁵

14

15 **4. PROGRAM COSTS**

16 In 2025 Toronto Hydro requires \$48.6 million in rate funding for the Customer Care
 17 program, which represents an increase of \$7.1 million over the last rebasing in 2020.

⁵ This segment excludes interactions with the utility’s large customers and key accounts, which are captured under the Key Accounts segment of the Customer Operations program in Exhibit 4, Tab 2, Schedule 8.

1 When normalized for shared services recoveries outlined in Exhibit 4, Tab 5, Schedule 1,
 2 the expected increase in this program is \$7.4 million.

3

4 Over the 2025-2029 rate period, the utility expects the cost of this program to increase
 5 by an annual growth rate of 3.7 percent which is necessary to address the program
 6 needs and deliver the customers outcomes enabled by this program.

7

8 The proposed level of Program funding is expected to maintain and improve Toronto
 9 Hydro’s level of customer service, support the implementation of public policy initiatives,
 10 be responsive to customers’ emerging needs and preferences, and support continuous
 11 improvement efforts to help the utility achieve its strategic objectives and outcomes,
 12 including the modernization of business processes in response to industry trends such as
 13 electrification and for the enhancement of customer experience.

14

15 The Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-2029) expenditures
 16 for each segment are summarized in Table 3 below.

17

18 **Table 3: Customer Care Program Expenditures by Segment (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Billing, Remittance and Meter Data Management	19.4	18.9	19.4	20.9	23.1	23.7	25.0	25.4	26.2	27.0
Collections	24.9	9.0	7.8	9.6	10.2	10.2	10.9	11.0	11.3	11.6
Customer Relationship Management	11.4	11.4	12.1	14.4	15.1	14.7	15.7	16.1	16.9	17.5
Total	55.7	39.3	39.3	44.9	48.4	48.6	51.6	52.5	54.4	56.1

1 **4.1 Cost Drivers**

2 The Program's cost increases are primarily a result of:

- 3 • Replacing retired and vacant positions to attain operationally effective staffing
4 levels;
- 5 • Building temporary backfill teams to support large-scale foundational projects
6 such as Advanced Metering Infrastructure ("AMI") 2.0 and Customer Information
7 System ("CIS") Project, and staff transitioning between these projects and day-
8 to-day operational functions;
- 9 • Increasing external vendor costs due to increases in payroll costs and other
10 inflationary pressures;
- 11 • Increased costs relating to post-COVID-19 collections activities at higher than
12 pre-COVID-19 volumes and arrears balances until electricity payment arrears are
13 normalized;⁶
- 14 • Increasing staff levels to develop and deploy new programs to enhance customer
15 service; and
- 16 • Implementing and operationalizing new public policy initiatives that may require
17 additional customer service, collections, and field resources.

18

19 As the electricity industry evolves, Toronto Hydro's customer service functions must
20 keep up with broad changes in customer needs and preferences driven by the energy
21 transition and adapt to handle evolving customer behaviour and more complex
22 information. The utility is already observing these trends even with respect to
23 traditional customer interactions. For example, a high bill inquiry now often requires a
24 frontline representative to consider more factors than before, such as the customer's

⁶Since the resumption of disconnections in June 2022, although Toronto Hydro has seen an improvement in the arrears balances of 57 percent (due to reverting to pre-COVID-19 guidelines and severance thresholds during the 2023 disconnection cycle), continued effort is required to return to pre-COVID-19 levels.

1 choice of available pricing plans (tiered, Time of Use, Ultra-Low Overnight Time of Use)
2 or the customer’s usage of electricity-intensive devices such as electric vehicle chargers
3 or heat pumps. These trends are even more pronounced with respect to services that
4 have been historically niche areas, but are gradually becoming more commonplace,
5 such as DERs. For example, the billing of net metered accounts is an order of magnitude
6 more complex than regular load accounts, due to the calculation of generation credits
7 and the treatment of Harmonized Sales Tax.

8

9 In this environment, customers’ expectations are also continually reshaped by all service
10 providers they interact with, not just utilities. As online services and electronic
11 transactions are gradually becoming the norm for the majority of small and large
12 businesses, customers are coming to expect the same standard of service from their
13 electricity distributor as table stakes.

14

15 The Program has been adapting to these trends by increasing the variety of
16 communication channels available to customers, with a focus on self-service. In 2022,
17 the number of such channels increased from seven to nine, with the addition of live chat
18 and Toronto Hydro’s mobile application.⁷ As a result, customers are currently able to
19 perform a broad variety of online transactions, such as registering for eBills, requesting
20 move-ins or move-outs, downloading consumption information for their rental property
21 to comply with the utility’s obligations under the Ontario Regulation 389/10,⁸
22 registering for pre-authorized debit payments, or reporting streetlight outages. While
23 each channel adds to customer convenience, managing interactions through different

⁷ Prior to 2022, communication channels included telephone, email, fax, mail, Toronto Hydro’s website, interactive voice response (“IVR”) through the Contact Centre function, and the online Customer Self-Serve (“CSS”) portal.

⁸ Ontario Regulation 389/10, under the *Energy Consumer Protection Act, 2010*, SO 2010, c 8.

1 channels requires different staff skills to operate systems and perform analytics for
2 gaining insights on customer behaviour and each channel's effectiveness and efficiency.

3 Against these trends, Toronto Hydro plans to transfer a portion of certain Program
4 functions from its external contact centre vendor to internal staff, in order to better
5 build, preserve, and diversify in-house knowledge and expertise of core functions and
6 leverage the same for modernization initiatives and projects or business processes
7 borne out of regulatory compliance requirements. This approach will increase
8 operational and financial flexibility for the Program by reducing dependency on external
9 vendors and mitigating the effects of associated cost increases.

10

11 Parallel to the insourcing effort, the Program will hire new staff to replace retiring staff
12 and/or fill vacant positions. The addition of new and the proportion of relatively
13 inexperienced staff will drive the need for more training time and quality assurance
14 ("QA") work, which further contributes to the Program's staffing needs. In order to
15 increase the effectiveness of QA processes, Toronto Hydro plans to increase its reliance
16 on data analytics. For example, the deployment of a speech analytics tool will
17 automatically transcribe and analyze customer interactions to provide objective
18 indicators of customer sentiment and intent, and identify call drivers. The application of
19 this data to automated quality management, powered by artificial intelligence and
20 machine learning technologies, will enable the Program to evaluate customer relations
21 representatives' performance on telephone calls based on robust empirical data and
22 provide much more precise and effective feedback. In order to fully leverage these
23 capabilities, the Program will also hire staff with the necessary data analytics skillsets.

24

1 Another area driving resourcing needs will be knowledge management. As the
2 complexity of service offerings and customer interactions grows, either through new
3 legislative and regulatory requirements or evolving customer needs and technologies, it
4 will become more important to keep knowledge management databases current. To
5 address this need, the Program will hire dedicated staff for maintaining consistent and
6 current information and making it accessible to customers and staff across all
7 engagement channels.

8

9 In addition to the cost drivers listed above, Toronto Hydro expects that broader industry
10 trends will drive costs under the Program over the 2025-2029 rate in response to the
11 following customer service expectations:

- 12 • **Support for EV Users:** As EV ownership and usage increases, the utility anticipates
13 an increase in customer inquiries related to EV's and EV charging on topics such as
14 service upgrades, infrastructure (e.g. questions about installing/troubleshooting
15 charging stations), available pricing plans, and on-street charging and billing. To
16 provide an effective response to these types of inquiries, Toronto Hydro will
17 require additional specialized resources possessing the relevant knowledge for its
18 Contact Centre, under the Customer Relationship Management segment. In
19 addition, the utility will need to develop new business processes or modify existing
20 ones to ensure the seamless management of EV-related inquiries and improve
21 related internal support systems.
- 22 • **Support for DER Owners and Operators:** As more customers adopt distributed
23 generation (e.g. solar panels) and energy storage systems, Toronto Hydro
24 anticipates an increase in customer inquiries related to these technologies, such
25 as connections to the distribution system, net metering and associated billing,
26 guidance on optimizing energy use, participation in current and future demand

1 management programs, or to report issues with DER equipment. In addition, these
2 customers will be looking for additional support in understanding and managing
3 their energy consumption patterns. To support these customers, the utility will
4 need to upskill and allocate additional resources to provide customers with timely
5 and effective service.

6 7 **4.2 Cost Control and Productivity Measures**

8 Toronto Hydro recognizes that it must remain responsive to all customers' needs and
9 preferences and the utility continues to actively seek out efficiencies and productivity
10 improvements throughout Program operations.

11 During the 2020-2024 rate period, Toronto Hydro successfully implemented numerous
12 public policy initiatives by achieving a plethora of process and technological
13 improvements, limiting the number of additional staff resources that would have been
14 required in absence of such improvements. For example, the implementation of the Ultra-
15 Low Overnight Time of Use ("ULO") Price Plan in 2023 required additional customer
16 service, meter data and billing resources to ensure appropriate processing of customer-
17 requested price plan changes and exception handling. However, Toronto Hydro was able
18 to implement the ULO Price Plan and other initiative without hiring additional resources
19 by reallocating existing resources efficiently and managing costs through the following
20 strategies:

- 21
22 • Enhancements to the Customer Self-Serve (CSS) portal made it easier for
23 residential customers to register for pre-authorized debit (PAD) online, and
24 added functionality to extend these online services to commercial customers.
25 This resulted in increased PAD adoption by 15 percent between 2020 and 2022
26 period;

- 1 • Development of a customer escalation team to respond effectively to
2 increasingly complex nature of customer complaints and escalations;
- 3 • Ongoing oversight, management, and improvements of the metering
4 infrastructure enabled Toronto Hydro to reduce estimated billing and consistently
5 exceed the OEB-prescribed Billing Accuracy target of 98 percent over 2020-2022;
- 6 • Automation of the meter exchange program to eliminate manual inputs of meter
7 data into the CIS, saving approximately 5 minutes per meter change or 4,000
8 person-hours of manual work on average;
- 9 • Reduction in paper, printing, and postage costs by converting a total of
10 approximately 381,000 customers to electronic billing since 2013, yielding
11 cumulative savings of \$4.4 million as of the end of 2022;
- 12 • Redesign of the CSS portal with additional functionalities to reduce the need for
13 customer contact, increasing the proportion of automated moves from 12 percent
14 in 2020 to 22 percent in 2022, the equivalent of 20,000 moves;
- 15 • Redesign and promotion of the customer self-service features on Toronto Hydro’s
16 website, providing easier 24/7 access to customer information, reducing the need
17 for customer contact;
- 18 • Launch of new communication channels to target a broad range of customer
19 interaction preferences, including live chat and a mobile application;
- 20 • As a result of the improvements to the accessibility and promotion of self-service
21 features, over the 2020-2022 period, the number of customer self-service
22 transactions have increased more than ten-fold from about 200,000 to almost 3.6
23 million and resulted:
- 24 ○ a 16 percent reduction (approx. 67,000) in call volumes; and
25 ○ a 24 percent reduction (approx. 23,000) in email volumes.

- 1 • Better workflow management to streamline and automate telephone and email
2 response processes and improve customer response times, which enabled the
3 utility to consistently exceed the OEB-mandated Telephone Accessibility Written
4 Response to Enquiries targets over 2020-2022;
- 5 • Introduction of pre-defined tasks to respond to common customer requests and
6 automation of process controls including bots and additional reporting, for areas
7 such as the automation of back-end meter exchanges in the CIS (e.g. filling in
8 new/old badge numbers, meter reads collected from the field, completing the
9 field activity) and the addition of meter inventory to the CIS (serial numbers,
10 nameplate information, etc.);
- 11 • Elimination of the manual work required to process and record field activities and
12 updating the CIS by automating the processing of field activities and subsequent
13 updates to the CIS through the implementation of a mobile workforce
14 management system. This system allows field staff to record and update systems
15 through hand-held devices, reducing the risk of billing errors, and enabling the
16 submission of meter reads directly from the field, contributing to timely and
17 accurate billing;
- 18 • Streamlining operations to improve access to meters, which reduced the annual
19 number of manually read meters from 885 to 162 over the 2020-2022 period;
- 20 • Developing and implementing a standard operating procedure for the cancellation
21 of bills, enabling the Billing, Remittance, and Meter Data Management segment
22 to handle billing errors in a more streamlined manner and contributing to the
23 accurate reporting of Toronto Hydro's billing accuracy performance;
- 24 • Optimizing the process for identifying customers in premises where the service is
25 energized and no account has been opened to more effectively mitigate future
26 risks associated with unbilled electricity and the accumulation of bad debt; and

- 1 • Streamlining the customer communications process for rate reclassifications to
2 better aid customer understanding and reduce the volume of administrative
3 tasks and printing costs.

4 5 **5. BILLING, REMITTANCE, AND METER DATA MANAGEMENT SEGMENT**

6 **5.1 Segment Description**

7 The Billing, Remittance, and Meter Data Management segment includes reading
8 electricity meters, the validation and management of meter data, the preparation of
9 customer bills, and the processing of payments and refunds.

10

11 The Billing, Remittance, and Meter Data Management segment is at the core of Toronto
12 Hydro's meter-to-cash process that transforms customers' electricity consumption,
13 demand, and other billable activities into bills in accordance with the utility's tariff of rates
14 and charges, OEB rate orders, and other applicable legislative and regulatory
15 requirements, and processes customers' payments and refunds. In performing this work,
16 the utility provides its customers with a variety of billing and payment options in
17 accordance with their needs and preferences. Many of these options involve high levels
18 of automation, enabling faster receipt of payments, more effective customer
19 communications, lower costs, optimal cash flow, and higher customer satisfaction. In
20 addition, the automated nature of the majority of data collection and verification
21 processes facilitate timely and accurate billing practices. Over the 2020-2022 period,
22 Toronto Hydro enhanced its automated meter data collection and verification
23 capabilities, maintained annual billing accuracy results over 99 percent, expanded its
24 offerings of online and self-service tools, and implemented numerous public policy
25 initiatives.

1 **5.1.1 Billing**

2 The Billing function is responsible for the creation and issuance of bills for electricity
3 distribution and other services. Toronto Hydro prepares and issues over nine million bills
4 annually and offers its customers multiple delivery options, including standard paper-
5 based bills and electronic bills (“eBills”). For customers with specific accessibility needs,
6 Toronto Hydro provides additional accommodation options, including bills with increased
7 text size and audio playback.

8
9 In addition to issuing electricity bills, Toronto Hydro prepares and issues over 12,300 bills
10 annually for other services, such as customer connections and expansions, including DER
11 connections, service upgrades, customer-requested disconnections and reconnections,
12 and distribution asset relocations.

13
14 Annually, the utility conducts a rate classification review for all non-residential customers,
15 per the Distribution System Code (“DSC”), to validate the rate class for these customers.
16 Where changes to a customer’s annual consumption or monthly average peak demand
17 justify a reclassification, the utility reassigns the customer to the appropriate rate class.
18 As part of the rate classification review, Toronto Hydro also reviews any pricing plan
19 elections (such as tiered, time of use, or ULO) and self-declarations to verify that the
20 customer’s account is billed on the appropriate pricing plan and enrolled in
21 programs/rebates for which the customer is eligible, such as the Ontario Electricity
22 Rebate. This process ensures the timely and accurate reclassification and billing of non-
23 residential customers, and the accurate calculation of revenue.

24
25 The utility also administers and executes the Industrial Conservation Initiative (“ICI”)
26 program whereby eligible Class A customers pay global adjustment (“GA”) charges based

1 on their contribution to Ontario's top five peak hours over the applicable base period.
2 Managing this process requires Billing staff to verify customer demand and eligibility,
3 obtain confirmation of the customer's choice to opt in or out of ICI (where applicable),
4 work with other Toronto Hydro personnel to obtain key information from and submit
5 reporting data to the IESO, and accurately reflect all applicable inputs on customers' bills
6 for the applicable adjustment period.

7

8 The utility frequently receives requests from customers for electricity consumption or
9 demand data. Two of the most common types of requests come from 1) owners of
10 commercial, industrial, and multi-unit residential buildings with a gross floor area of
11 50,000 square feet in order to comply with the requirements of the Large Buildings Energy
12 and Water Consumption Reporting and Benchmarking ("EWRB") program,⁹ and 2)
13 residential landlords of suite metered units in residential complexes.¹⁰ To respond to
14 these requests, Billing staff extract data from the CIS and provide the requested
15 information through the customer's preferred channel.

16

17 The utility also provides tailored services to its net metered customers, including
18 establishing and renewing net metering agreements, responding to inquiries related to
19 the net metering service, generating bills and issuing credits in accordance with Ontario
20 Regulation 541/05 ("Net Metering Regulation"),¹¹ including applicable taxation rules for
21 Harmonized Sales Tax ("HST") registrants.¹²

⁹ Ontario Regulation 506/18, under the *Electricity Act, 1998*, SO 1998, c. 15, Schedule. A.

¹⁰ *Supra* note 8.

¹¹ Ontario Regulation 541/05, under the *Ontario Energy Board Act, 1998*, SO 1998, c. 15, Sched. B and Section 6.7 of the Ontario Energy Board's *Distribution System Code*.

¹² *Excise Tax Act*, RSC 1985, c. E-15.

1 To ensure ongoing functionality and compliance with relevant legislative and regulatory
2 requirements of the meter-to-cash process, Toronto Hydro maintains a system of internal
3 controls for all systems and processes, and reviews these on an annual basis. These
4 controls enable the utility to discover any billing errors in a timely manner and promptly
5 take the necessary actions to correct them.

6 As the industry shifts towards electrification, the utility's billing practices must also evolve
7 to account for the evolution of customers' needs and preferences as the use of EVs and
8 EV charging stations, and DERs become commonplace.

9

10 **5.1.2 Remittance (Payment) Services**

11 The Remittance function is responsible for the management of customer payments,
12 transfers, refunds and related processes, and the processing of retailer service transaction
13 requests ("STRs").

14

15 Toronto Hydro accepts a variety of payment methods including cheques, transfers
16 through a variety of financial institutions, and electronic funds transfers ("EFT"). The
17 utility also accepts credit card payments in limited circumstances where a customer is in
18 the process of disconnection for non-payment.

19

20 Remittance staff is also responsible for setting up pre-authorized debit ("PAD")
21 arrangements upon customers' request. The utility promotes PAD to its customers to
22 optimize cash flow and minimize the risk of bad debt due to non-payment. Since October
23 2021, enhancements to the CSS portal have simplified the registration process for
24 residential customers and enabled commercial customers to register for PAD
25 electronically, which has increased PAD adoption by 15 percent between the 2020 and
26 2022 period.

1 In accordance with the OEB's Standard Supply Service Code, Toronto Hydro also offers
2 residential and general service under 50 kW customers on standard supply the option to
3 smooth out their payments through an equal monthly payment plan ("EPP").

4 Remittance staff work closely with Toronto Hydro's financial institution to process any
5 payment issues and errors such as non-sufficient funds ("NSF"), returned payments, or
6 misapplied payments.

7

8 The utility processes approximately 2,800 refunds and credits per month for customers,
9 which include: IESO payments to generation customers (e.g. participants in the Feed-in
10 Tariff program), refunds or security deposits, application of Ontario Electricity Support
11 Program ("OESP") credits, and retailer-initiated adjustments.

12

13 Remittance staff also perform other tasks such as payment tracing, transfers of balances,
14 and exception handling in the CIS as needed with respect PAD, EPP, OESP credits, refunds,
15 address errors, payment reversals, etc. These supporting tasks may also include targeted
16 customer communications relating to OESP registration renewals and a variety of other
17 scenarios, which typically generate approximately 1,600 customer letters per month.

18

19 As of 2022, 21 retailers were registered and set up on the provincial Electronic Business
20 Transaction ("EBT") System for operation within Toronto Hydro's service territory on
21 distributor-consolidated billing. Remittance staff are responsible for retailer management
22 functions such as settlements with retailers, the issuance of supply change notification
23 letters to low volume customers, the processing of STRs and historical information
24 requests, and responses to relevant retailer and customer inquiries. Remittance staff
25 ensure accurate data flows through the EBT System and timely and accurate settlements
26 with retailers.

1 Finally, Remittance staff annually issue T5 tax forms to customers accruing interests on
2 their security deposits in accordance with applicable tax legislation and regulations.
3 In support of the processes described above, Remittance staff maintains several controls
4 to ensure the accuracy of internal and external reporting and record keeping, such as a
5 daily bank reconciliation to match incoming payments through various channels to what
6 is recorded in the bank general ledger, daily refund reconciliations between the CIS and
7 the financial system, and the daily review of aged credit reports to ensure credits are
8 promptly returned to customers.

9

10 **5.1.3 Meter Data Management**

11 The Meter Data Management (“MDM”) function is responsible for the collection and
12 processing of meter data for billing and settlement purposes. As of January 1, 2023,
13 Toronto Hydro had over 803,000 installed meters, of which over 99.9 percent are read
14 remotely on a daily basis. The automated meter data is retrieved by one of Toronto
15 Hydro’s three data collection systems. Each data collection system serves different meter
16 types and customer classes, and requires specialized skills to maintain acceptable data
17 quality standards. These data collection systems further pass the data to two separate
18 meter data management systems. The two meter data management systems validate the
19 data for consistency, accuracy, and readiness for billing. If the meter data is not
20 successfully validated, the systems will automatically attempt to estimate the correct
21 reading. If the systems cannot develop an estimate for the missing data the entry is
22 directed to MDM staff to manually assess for billing, for which average volumes of
23 approximately 664 accounts are assessed on a monthly basis.

24

25 As of 2022, Toronto Hydro had approximately 160 manually read meters in locations
26 where remote data collection is not possible, such as parking garages with limited cellular

1 signals. The utility is prioritizing the installation of antenna extensions for wireless capable
2 meters experiencing such communication problems, to facilitate remote communication
3 with meters and reduce manual reads. The utility’s continuous improvement efforts to
4 expand automated meter data collection have contributed to the utility achieving strong
5 Billing Accuracy results of over 99 percent in 2022, exceeding the OEB-prescribed billing
6 accuracy performance metric.

7

8 In addition, Toronto Hydro is working on further improving the efficiency of data
9 collection by modernizing its systems, enhancing communication networks, and
10 improving system processing capabilities to increase the amount of meter data that is
11 retrieved automatically. For example, through the AMI 2.0 initiative, the utility is going
12 to replace the entire population of residential and small commercial smart meters with
13 next generation smart meters and upgrades to supporting metering infrastructure to
14 deliver certain out-of-the-box capabilities beyond AMI 1.0, which was predominantly
15 focused on meter-to-cash efficiencies. These new benefits include improved billing
16 accuracy, faster outage response, improved network range, enhanced security against
17 cyber-threats, increased grid transparency (i.e. system observability), improved data
18 granularity and analytical capabilities, and improved customer experience thanks to
19 greater meter reliability and robust integration with metering data collection and
20 reporting processes.¹³ Over the 2025-2029 period, Toronto Hydro is deploying additional
21 gate keepers and antenna extensions for interval meters to improve automatic data
22 collection.

23

24 In addition to metered customers, Toronto Hydro serves approximately 17,800
25 Unmetered Scattered Load (“USL”) connections as of 2022, which include service to bus

¹³ Exhibit 2B, Section E 5.4.

1 shelters, cable television boosters, telephone booths, traffic and park lighting, and signs.
 2 These unmetered devices typically consume the same amount of electricity each month
 3 and therefore, billing determinants are based on the technical consumption parameters
 4 of the device. The Billing, Remittance, and Meter Data Management segment is
 5 responsible for maintaining an up-to-date list of all service locations and updating usage
 6 calculations when customers make changes. To ensure accuracy in billing USL services,
 7 the utility annually conducts an average of 500 random field audits and reconciliation
 8 exercises with its customers.

9

10 **5.2 Billing, Remittance, and Meter Data Management Segment Costs**

11 Table 4 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast Year
 12 (2025-2029) expenditures for the Billing, Remittance, and Meter Data Management
 13 segment.

14

15 **Table 4: Billing, Remittance, and Meter Data Management Segment Expenditures (\$**
 16 **Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Billing, Remittance and Meter Data Management	19.4	18.9	19.4	20.9	23.1	23.7	25.0	25.4	26.2	27.0

17

18 The primary drivers of costs in this segment were, or are expected to be, the following:

- 19 • Backfilling of vacancies (2021-2023): Backfilling of vacancies due to filling current
 20 vacancies primarily attributable to retirements, resignations, promotions and CIS
 21 project requirements;
- 22 • Support the development and implementation of the CIS upgrade (2021-2022):
 23 For the period of 2021 -2022, increase in costs associated with additional temp

1 staff hired to replace the permanent staff that were moved from the CIS project
2 to support Operations, contributing to increased costs;

- 3 • Implementation of public policy initiatives (2020-2023): This cost is attributed to
4 ongoing mandatory legal and regulatory obligations such as changes to OEB and
5 IESO related programs, for example changes to Class A, OER, an introduction of
6 the ULO Price Plan as of May 1, 2023 and the Green Button Initiative by November
7 1, 2023 which require ongoing administrative costs to implement these initiatives;
- 8 • Annual compensation increases; and
- 9 • Increases to external vendor costs: As a result of inflationary pressures, increases
10 in vendor payroll due to increases in minimum wage, consumable cost etc.

11

12 The proposed level of funding is necessary to mitigate several segment-level risks,
13 including:

- 14 • Decline in timely and accurate meter reading and the resolution of meter-related
15 issues, as well as delays in the future implementation of initiatives associated
16 with the rollout of AMI 2.0;
- 17 • Decrease in timely and accurate billing, resulting in billing errors, lower customer
18 satisfaction, and risks to Toronto Hydro's financial viability;
- 19 • Reduced ability to promptly and accurately reclassify non-residential customers,
20 resulting in decreased billing accuracy;
- 21 • Inability to process payments, credits, and refunds in a timely and accurate
22 manner, jeopardizing the utility's cash flow and increasing the costs of working
23 capital;
- 24 • Failure to attain full revenue collection, resulting in higher levels of bad debt and
25 affecting the financial stability of the Toronto Hydro;

- 1 • Changes in existing or new public policy and regulatory changes may not be
2 implemented in accordance with required timelines or in the most cost-effective
3 manner;
4 • Reduced ability to respond appropriately to future changes in customers' needs
5 and preferences; and
6 • Reduced ability to automate and continuously improve the efficiency of business
7 processes.

8
9 **5.3 Billing, Remittance, and Meter Data Management Segment Year-over-Year**

10 **Variance Analysis**

11 2020 - 2021 Variance Explanation

12 Costs decreased by \$0.5 million primarily due to the following reasons:

- 13 • \$1.0 million decrease in payroll costs due to filling vacancies and transfer of staff
14 to the CIS program;
15 • \$0.3 million decrease in labour costs due to capitalization of business labour to
16 projects;
17 • \$0.1 million increase in temporary and contracted labour to backfill for vacancies;
18 • \$0.4 million decrease in postage from conversion of customers from paper bills to
19 eBills;
20 • \$0.2 million increase in business processing services due to inflation;
21 • \$0.4 million increase to adjust a bad debt accounting provision (ECL) for non-
22 electricity accounts receivables;
23 • \$0.4 million increase in contracted field services to support reactive metering
24 work, and
25 • \$0.1 million increase in printing costs due to inflation.

1 2021 - 2022 Variance Explanation

2 Costs increased \$0.5 million primarily due to the following reasons:

- 3 • \$0.3 million increase in payroll costs due to the filling of vacancies and
4 compensation increases;
- 5 • \$1.5 million decrease in labour costs due to capitalization of business labour to
6 capital projects (e.g. CIS);
- 7 • \$1.0 million increase in contracted services for temporary staff to backfill
8 vacancies and staff transferred to capital projects (e.g. CIS);
- 9 • \$0.4 million increase in contracted business processing services due to backfilling
10 for staff on capital projects (e.g. CIS) and inflationary pressures;
- 11 • \$0.1 million increase in other support costs, and
- 12 • \$0.2 million increase in postage costs due to inflation, offset by savings in
13 converting customers to eBills.

14
15 2022 – 2025 Variance Explanation

16 Between 2022 and 2025, costs in this segment are expected to increase by \$4.3 million.

17 This is primarily due to the following reasons:

- 18 • Increase in labour costs due to compensation increases, filling of vacancies and
19 planned upskilling, fewer business resources capitalized to projects, primarily
20 meter technology projects and the CIS project, higher contract costs for
21 external vendors supplying business processing services and field support to
22 maintain resourcing capacity and increased complexity, and increases in
23 postage and payment processing fees; and
- 24 • This was partially offset by a decrease in contracted services for temporary staff
25 replaced by internal staff returning from the CIS project and other technology
26 projects, a reduction in the accounting provision for bad debt for non-electricity

1 accounts, and actual and forecasted ebill adoption helping to contain postage
2 and printing cost increase impacts.

3

4 2025 – 2029 Variance Explanation

5 Between 2025 and 2029, costs in this segment are expected to increase by \$3.3 million,
6 to maintain the resourcing capacity and capabilities required to support the increased
7 volume and complexity of work discussed above. If Toronto Hydro were forced to
8 deliver this segment with a reduced level of funding over the 2025-2029 rate period, the
9 utility could face various legal and regulatory compliance risks and drawbacks, in
10 addition to the following:

11

- 12 • A decrease in timely and accurate billing, resulting in billing and settlement errors,
13 lower customer satisfaction, increased customer contacts, and risks to Toronto
14 Hydro’s financial viability;
- 15 • A decline in timely and accurate meter reading and resolution of meter-related
16 issues, which may result in greater reliance on estimated bills and lower billing
17 accuracy;
- 18 • Inability to process payments, credits, and refunds in a timely and accurate
19 manner, jeopardizing the utility’s cash flow and increasing the costs of working
20 capital; and
- 21 • Reduced ability to prioritize and schedule the AMI 2.0 implementation and attain
22 the associated benefits such as remote disconnection and improved meter
23 communication capabilities.¹⁴

¹⁴ *Ibid.*

1 **6. COLLECTIONS SEGMENT**

2 **6.1 Segment Description**

3 The Collections segment involves work related to tracking and collecting amounts owing
4 on customer accounts and administering financial assistance programs such as the Low-
5 Income Energy Assistance Program (“LEAP”),¹⁵ and the Ontario Electricity Support
6 Program (“OESP”). Toronto Hydro’s collections procedures work to minimize the bad debt
7 expenses incurred by the utility, while providing customers flexible options and assistance
8 to pay outstanding accounts. The segment plays a key role to Toronto Hydro’s financial
9 viability and settlement process through the collection of distribution revenue and other
10 rates and charges while minimizing bad debt expenditures. In the absence of a robust
11 collections process, the utility’s bad debt expenditures would increase and settlement
12 variances would grow, to the detriment of all ratepayers and other sector participants.

13

14 To assist with collections-related customer inquiries, dedicated customer relations
15 representatives are available on business days from 8:00 a.m. to 10:00 p.m. from May to
16 November, and from 8:00 a.m. to 8:00 p.m. from December to April. Customers also have
17 24/7 access to collections information through an interactive voice response (“IVR”)
18 system, Toronto Hydro’s mobile application and the CSS portal. These options assist
19 customers by providing access to key information such as current and historical account
20 balances, consumption and demand information, payment options, and bill amount
21 predictions.

22

23 To facilitate stable and predictable cash flows and manage emerging arrears, Toronto
24 Hydro proactively issues approximately 592,000 account overdue notices and places
25 842,000 account overdue reminder phone calls to its customers each year. To manage

¹⁵ *Supra* note 3.

1 the costs of these high-volume activities while maintaining the efficiency and timeliness
2 of reminders, the utility deploys automated systems for both types of notifications.

3

4 As of the end of 2022, Toronto Hydro had over 97,000 smart meters capable of remote
5 disconnection, reconnection, and intermittent disconnection. By enabling remote
6 disconnection, this technology reduces on the need for conducting costly field visits and
7 lowers the risk of accumulating bad debt. These meters also allow for remote
8 reconnections, which helps the utility meet the OEB-prescribed reconnection
9 performance standard of reconnecting customers within 2 business days of receiving
10 payment, allowing Collections staff to restore power almost immediately upon receipt of
11 payment without the need to schedule a site visit for reconnection, also positively
12 impacting the customer experience. As Toronto Hydro upgrades more of its smart meters
13 to remotely controlled models, remote disconnections and reconnections will become
14 more frequent.

15

16 To give effect to the OEB's winter disconnection moratorium in accordance with the
17 Distribution System Code, Collections staff have processes in place to rapidly identify and
18 contact residential customers previously disconnected for non-payment, process
19 reconnections, and provide information on financial assistance programs.

20

21 To encourage timely payments, proactively identify at-risk accounts, and otherwise
22 facilitate the collection of arrears, Collections staff also undertake the following activities:

- 23 • Managing and monitoring approximately 12,000 commercial accounts with
24 security deposits and overseeing the annual process of security deposit
25 reassessments;

- 1 • Preparing and sending approximately 14,000 accounts per year to external
2 collection agencies for collection;
- 3 • Establishing arrears payment agreements (“APAs”), equal payment plans, and
4 other custom payment plans to assist customers with paying off their arrears; and
- 5 • Educating customers on and overseeing the administration of financial assistance
6 programs such as LEAP and OESP.
- 7

8 On March 17, 2020, the Government of Ontario declared a state of emergency pursuant
9 to the *Emergency Management and Civil Protection Act* in response to the World Health
10 Organization declaring the COVID-19 outbreak as a global pandemic.¹⁶ This resulted in
11 immediate and material disruptions to businesses and the economy, as the Government
12 of Ontario and City of Toronto imposed various restrictions and closures on public health
13 grounds that lasted at varying degrees until the last restrictions were lifted in 2022.

14

15 More specifically in the utilities sector, on March 19, 2020, the OEB extended the winter
16 disconnection moratorium for all low-volume customers until July 31, 2020.¹⁷ As a result,
17 electricity distributors were prohibited from issuing disconnection notices for non-
18 payment to these customers until August 1, 2020. During this time, in addition to
19 complying with the requirements mandated by the OEB and different levels of
20 government, Toronto Hydro implemented several temporary changes to its customer
21 service rules and procedures to provide greater relief to its customers, consistent with
22 the approach taken by other utilities. Toronto Hydro:

- 23 • reduced its late payment charge by 75 percent;

¹⁶ RSO 1990, c. E.9. [*Emergency Management and Civil Protection Act*].

¹⁷ The OEB provided further relief through successive licence amendments in 2021 by prohibiting electricity distributors from issuing disconnection notices to residential customers from April 13, 2021 until June 2, 2021. For more information, refer to OEB decisions and orders in EB-2020-0109 and EB-2021-0137.

- 1 • waived the Returned Cheque charge, normally collected for payments returned as
2 NSF by banks due to customer account having insufficient funds to cover the
3 payment;
- 4 • sent targeted arrears communications to provide its customers with greater
5 flexibility in payment terms, offer APAs, and promote financial assistance
6 programs such as LEAP, OESP, the COVID-19 Energy Assistance Program (“CEAP”)
7 and COVID-19 Energy Assistance Program for Small Business (“CEAP-SB”), and the
8 Canada Emergency Response Benefit (“CERB”); and
- 9 • voluntarily extended its moratorium on disconnecting residential and low volume
10 customers.

11

12 Collectively, these measures remained in effect from March 2020 until July 2022, with the
13 exception of Toronto Hydro’s extended disconnection moratorium which ended in June
14 2022.

15

16 In 2020, Toronto Hydro recorded an incremental \$17.2 million in bad debt expenses as a
17 result of the COVID-19 emergency and related financial pressures. Consequently, the
18 utility adjusted its expected credit loss (“ECL”) provision based on trends for customer
19 collections, and current and forecasted economic conditions at the time to account for
20 higher levels of expected customer defaults than pre-pandemic levels. Between 2020 and
21 2022, Toronto Hydro continued to actively monitor its exposure to credit risk, including
22 the potential impacts of the pandemic, and made subsequent adjustments to the ECL
23 provision as needed.¹⁸

¹⁸ There is some uncertainty of the pandemic’s impacts, the utility could not provision for all possible outcomes.

1 As of the summer of 2022, Toronto Hydro resumed its disconnection activities for non-
 2 payment by applying a segmented approach, focusing first on customers with larger
 3 balances or higher collections risk, particularly those with pre-pandemic arrears. The
 4 utility also continued providing greater flexibility in payment terms, such as longer
 5 payment periods and reduced down payment options. Overall, Toronto Hydro expects
 6 that the measures it took in response to the COVID-19 pandemic has saved its customers
 7 from undue hardship and has better positioned the utility to deal with the bad debt
 8 impacts going forward.

9

10 **6.2 Collections Segment Costs**

11 Table 5 below provides the Historical (2020-2022), Bridge (2023-2024), and Forecast Year
 12 (2025-2029) expenditures relating to the Collections segment:

13

14 **Table 5: Collections Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Collections	24.9	9.0	7.8	9.6	10.2	10.2	10.9	11.0	11.3	11.6

15

16 The costs for 2020 are a significant outlier due to the accumulated bad debt expense
 17 recorded in that year due to the COVID-19 pandemic.

18

19 The utility’s costs in this segment are expected to increase over the 2025-2029 period
 20 primarily due to payroll compensation increases during the term and inflationary
 21 pressures impacting vendor costs to support collections activities.

22

23 Generally, the volume of collections-related work and the success of collecting accounts
 24 in arrears is heavily influenced by the number of customer interactions, the number of

1 low income customers and the available assistance programs, the availability of collection
2 tools to encourage payment (such as the ability to disconnect for non-payment), the
3 number of customers who move out and receive a final bill in any given year,
4 macroeconomic conditions, industry disruptions causing bankruptcies, and regulatory
5 changes impacting customer behaviour and collections tools. Toronto Hydro monitors
6 trends and implements strategies to minimize the cost of bad debt to ratepayers. During
7 the 2020-2024 rate period, the implementation of OEB mandated customer service rule
8 changes (such as extension of the minimum payment period from 16 to 20 calendar days),
9 the effects of the winter disconnection moratorium, and Toronto Hydro's voluntary
10 extension of the disconnection moratorium for the duration of the COVID-19 pandemic
11 contributed to the utility attaining higher unpaid balances over longer collection cycles.

12

13 The proposed level of segment funding is expected to support efforts to manage the
14 accounts receivable balances, maximize the collection of distribution revenue and other
15 rates and charges while minimizing bad debt, and continue to offer flexible and
16 meaningful payment options. On a broader scale, the requested funding will support the
17 implementation of public policy initiatives, the utility's responsiveness to customers'
18 emerging needs and preferences, and continuous improvement through business process
19 enhancements and technological solutions. The proposed level of funding is necessary to
20 mitigate several segment-level risks, including:

- 21 • Increased volumes and amounts of arrears associated with unpaid accounts,
22 causing upward pressure on rates for all customers;
- 23 • Limited capacity to offer customers flexible and personalized arrears payment
24 options;
- 25 • Reduced ability to innovate service offerings, such as self-service payment
26 arrangements;

- 1 • Reduced ability to effectively develop, deliver, and communicate financial
2 assistance programs, leading to increased financial difficulties for customers and
3 greater likelihood of disconnections for non-payment, resulting in lower customer
4 satisfaction;
- 5 • Limited ability to modify collection tools or practices in response to changes in
6 customers' evolving needs and preferences; and
- 7 • Reduced cash flow for the utility, increasing the cost of working capital to the
8 detriment of ratepayers.
- 9

10 **6.3 Collections Segment Year-over-Year Variance Analysis**

11 2020 – 2021 Variance Explanation

12 Between 2020 and 2021, costs in this segment decreased by \$15.9 million due to the
13 following:

- 14 • \$0.2 million increase due to compensation increases,
- 15 • \$0.2 million decrease in contracted field services as a result of continuing the
16 utility's customer support strategy during COVID-19; and
- 17 • \$15.9 million decrease in bad debt as a result of the significant increase in 2020
18 for the accounting provision for bad debt (i.e. ECL) due to the COVID-19
19 pandemic.
- 20

21 2021 – 2022 Variance Explanation

22 Between 2021 and 2022, costs in this segment decreased by \$1.2 million due to the
23 following:

- 24 • \$0.1 million increase in collection agency fees reflecting higher average arrears
25 balances due to COVID-19;

- 1 • \$0.3 million decrease in labour costs due to capitalization of business labour
2 to projects, partially offset by increase in payroll costs due to compensation
3 increases;
- 4 • \$0.2 million increase in contracted clerical labour to backfill for staff working
5 on capital projects (e.g. CIS);
- 6 • \$0.4 million increase in contracted field resources reflecting the additional
7 collection activity volumes post COVID-19, and
- 8 • \$1.6 million decrease in bad debt that reflects a downward risk adjustment in
9 the accounting provision for bad debt (i.e.ECL) as COVID-19 related customer
10 arrears balances decline.

11

12 2022 – 2025 Variance Explanation

13 Between 2022 and 2025, costs in this segment are expected to increase by \$2.4 million
14 due to the following:

- 15 • Increases in labour cost as staff return from capital projects (e.g. CIS), partially
16 offset by a reduction in temporary labour no longer needed to backfill for staff
17 on the CIS Project;
- 18 • Increases in collection agency fees reflecting the higher volume of accounts,
19 post COVID-19, being assigned to third party collection agencies;
- 20 • Increases in contracted field collection activities to reflect higher than
21 historical customer payment arrears volumes and balances, post-COVID-19;
- 22 • Increases in payroll costs due to filling vacancies and compensation increases;
23 and
- 24 • Increases in the accounting provision for bad debt (i.e. ECL) to account for the
25 inflationary pressure on rates and subsequently on the receivables balance.

1 2025 – 2029 Variance Explanation

2 Between 2025 and 2029, costs in this segment are expected to increase by \$1.4 million,
3 to manage increases in payroll costs due to compensation increases, inflationary
4 pressure on the accounting provision for bad debt (i.e. ECL), and inflationary pressure on
5 several contracted business process, field service providers, and other collections
6 related vendors, as discussed above. If Toronto Hydro were forced to deliver this
7 segment with a reduced level of funding over the 2025-2029 rate period, the utility
8 could face various regulatory and legal compliance risks and drawbacks, including:

- 9 • Failure to attain full revenue collection, resulting in higher levels of bad debt and
10 affecting Toronto Hydro’s financial viability; and
- 11 • Limited ability to modify collection tools or practices in response to changes in
12 customers’ evolving needs and preferences.

13
14 **7. CUSTOMER RELATIONSHIP MANAGEMENT SEGMENT**

15 **7.1 Segment Description**

16 The Customer Relationship Management (“CRM”) segment involves Toronto Hydro’s
17 communications with its customers¹⁹ to provide information relating to customer service
18 and the utility’s operations, build trust, and maintain transparency. Toronto Hydro aims
19 to build trusted relationships by engaging customers at the right time, with the right
20 information, and through the right channel to meet their preferences. This approach
21 delivers customer value by providing efficient and timely responses to all enquiries,
22 building awareness of available service choices (such as billing format or pricing plan
23 options) and financial assistance programs, and educating customers on how to better
24 manage their electricity usage.

¹⁹ *Supra* note 5.

1 The segment includes the following functional areas: the Contact Centre, Escalations and
2 Special Investigations, Customer Experience, and Quality Assurance. These functions are
3 designed to provide high-quality customer service and improve operational efficiencies
4 identified through the tracking and analysis of inbound customer inquiries, transactional
5 surveys, and other means of soliciting customer feedback.

6

7 In addition to the functional areas noted above, the CRM segment is also responsible for
8 designing and overseeing technology projects for continuous monitoring, business
9 process analysis, and performance measurement activities, which drive customer
10 experience and efficiency improvements. To provide an optimal customer experience,
11 Toronto Hydro will need to adapt its services to each customer's unique needs and
12 preferences, especially as these needs and preferences evolve in conjunction with
13 broader trends. The utility expects that the CRM segment's workforce, business
14 processes, and tools will benefit from enhancements on multiple fronts to provide this
15 level of personalized service.

16

17 The CRM segment remains responsive to customer, public policy, and industry demands
18 by monitoring trends and adapting business processes, employing technology and
19 process improvements to help contain costs, developing more effective ways to address
20 customer enquiries at first contact, and supporting staff with training and upskilling.

21

22 **7.1.1 Contact Centre**

23 Toronto Hydro's Contact Centre is the primary functional area of the CRM segment. In
24 2022, the Contact Centre received and addressed approximately 70,000 written (paper
25 mail, fax, and email) enquiries and over 343,000 telephone calls. Customers engage with
26 the Contact Centre to inquire about the utility's business practices, available programs

1 and service choices (such as pricing plan options), government incentives and rebates,
2 payment options, electricity consumption and demand, moves, collections, financial
3 assistance programs, and a variety of other topics. During significant outage events, the
4 Contact Centre also provides 24/7 support to the Emergency Response program,²⁰ and
5 customers who want to report an outage or obtain current outage information.

6

7 As part of this function, Toronto Hydro tracks and processes customer move-ins and
8 move-outs to obtain correct meter data, identify account holders, and correctly address
9 and promptly issue first and final bills. In 2022, the utility processed over 183,000
10 customer moves, of which 24 percent were partially automated moves and 22 percent
11 were fully automated self-service moves. Over 2020-2022, customers' use of the CSS
12 portal for moves has increased by 92 percent.

13

14 The Contact Centre will need to adapt its business processes over the 2025-2029 rate
15 period to respond to the evolution of customers' needs and preferences. As broader
16 societal and industry trends point towards decarbonization and greater electrification
17 (e.g. the adoption of EVs and DERs by residents and businesses in greater numbers), the
18 potential for increased electricity prices, and new pricing and service options, customers'
19 needs, the information they require, and their expectations of service from Toronto
20 Hydro are all dramatically changing. Meanwhile, emerging technologies such as artificial
21 intelligence, machine learning, and process automation are enabling new channels and
22 opportunities for customer-utility interactions, while ensuring appropriate handling of
23 customers' personal information through policies and processes. In the context of these
24 developments, the Contact Centre will need to upskill its workforce and enhance its

²⁰ Exhibit 4, Tab 2, Schedule 5.

1 business processes and tools in response to customers' changing expectations and the
2 concomitantly increasing complexity and variety of enquiries.

3 The Contact Centre closely monitors the quality and efficiency of its customer contact
4 activities using a combination of OEB-mandated, common industry and internally
5 developed measures. Toronto Hydro performs well against the OEB's performance
6 targets in the areas of telephone accessibility, telephone call abandon rate, and written
7 response, consistently exceeding the mandatory service standards, whilst balancing costs
8 and meeting customer expectations. In 2022, the Contact Centre answered 79 percent
9 of calls within 30 seconds, and responded to over 99 percent of written enquiries within
10 ten days. To support Toronto Hydro's customer service objectives, the Contact Centre
11 operates from 8:00 a.m. to 8:00 p.m.

12

13 Customers increasingly use email to interact with Toronto Hydro and expect shorter
14 response times due to the electronic medium; therefore, the utility has put significant
15 effort into improving its performance in responding to written inquiries. In 2022, Toronto
16 Hydro responded to over 90 percent of emails within one business day. The utility
17 achieved this result by implementing a number of training and process improvements,
18 including enhancements to internal email routing algorithms, to quickly identify and
19 contact the most appropriate resource that can assess the customer inquiry and respond
20 to the email. Toronto Hydro has found that responding more quickly to customers has
21 reduced the total volume of emails annually by 25 percent (approximately 23,000 emails)
22 from 2020 to 2022, and resulted in a 15 percent increase in customer satisfaction in this
23 area. The utility also continues to change and evolve its business processes to redirect
24 customers with more complex questions, such as service upgrades for EV charging, to the
25 most appropriate communication channel or subject matter experts.

1 Through the introduction of various self-service tools such as the CSS portal and mobile
2 application, targeted process improvements, and upskilling, Toronto Hydro’s customer
3 response model is becoming more efficient at understanding and adapting to customer
4 inquiries faster and improving the overall customer service experience.

5

6 **7.1.2 Escalations and Special Investigations**

7 The Escalations and Special Investigations function resolves specific customer concerns
8 that require complex or detailed analysis. The most frequently occurring issues relate to
9 energy and bill management, including high bill issues, energy management, payment
10 challenges, and power quality requests pertaining to power interruptions and other
11 technical issues. With customers increasingly working from home since 2020, any
12 interruption in power, including momentary and short duration outages, has become
13 more impactful to customers. The Escalations and Special Investigations function intakes
14 escalated matters through a variety of channels. For example, in 2022, this function
15 processed approximately 1,900 escalations received through the Contact Centre, 112
16 through the Office of the President function under the Public, Legal and Regulatory Affairs
17 program,²¹ and 38 from the OEB. The Escalations and Special Investigations function is
18 also responsible for Toronto Hydro’s consumer complaint response process and the
19 resolution of customer escalations forwarded through the OEB’s E-Portal. The function
20 deploys field resources as necessary to investigate power quality, billing, or other issues.
21 In 2022, Escalations and Special Investigations resolved 99 percent of escalated customer
22 inquiries within ten business days or less.

23

24 In recent years, the issues handled by the Escalations and Special Investigations function
25 have become progressively more complex. The investigation and resolution of these

²¹ Exhibit 4, Tab 2, Schedule 18.

1 issues typically involve greater collaboration with internal stakeholders from multiple
2 capital and OM&A programs, such as Customer Operations,²² Work Program Execution,²³
3 or Public, Legal and Regulatory Affairs, and sometimes external stakeholders such as
4 provincial and municipal transit operators, various departments of the City of Toronto, or
5 social assistance agencies. Toronto Hydro expects the complexity of issues addressed by
6 this function to increase as more customers adopt DERs and EVs and as those resources
7 are integrated into distribution operations.

8

9 **7.1.3 Customer Experience**

10 The Customer Experience function works to achieve consistency across all customer
11 interactions through the expanded use of technology. Technological solutions allow for
12 the more efficient capture of customer interactions, more effective routing and
13 streamlined processing of work, the provision of structured options, and consistent
14 customer engagement. These enhancements in turn support the provision of high-quality
15 services and communications that align with customer needs and expectations, while
16 identifying ongoing trends and opportunities for the improvement of current programs
17 and the development of new programs.

18

19 The growth and evolution of the Customer Experience function over the 2025-2029 rate
20 period will lay the foundation for future customer interactions, which Toronto Hydro
21 expects to be highly influenced by the shift towards electrification. Federal, provincial,
22 and municipal energy policies are establishing plans, guidelines, and requirements that
23 support customers' need and ability to make informed decisions about their energy
24 usage and influence their bills through consumption behaviours and technology
25 investments. Customers will look to Toronto Hydro to provide the tools and information

²² *Supra* note 5.

²³ Exhibit 4, Tab 2, Schedule 12.

1 to enable them to make informed choices that best suit their lifestyles and budgets,
2 including public policy initiatives such as Green Button to comply with Ontario
3 Regulation 633/21.²⁴ This requires the utility to modernize its business processes, invest
4 in the appropriate tools that allow customers to effectively manage their energy usage
5 in emerging contexts (e.g. with respect to EV charging or load displacement via DERs)
6 and upskill resources to respond to the changes in customers' needs and expectations.
7 Much of the relevant investments in technology, additional resourcing, and process
8 modifications need to occur in advance of these industry shifts to ensure that Toronto
9 Hydro is prepared to respond to customers' needs in time for the energy transition.

10

11 Customer engagement plays a significant role in Toronto Hydro's decision making and
12 helps inform and guide overall business planning processes. Beyond survey-based
13 research, Toronto Hydro considers direct customer feedback and the advice of a
14 Customer Advisory Panel ("CAP"), discussed in greater detail in the Public, Legal and
15 Regulatory Affairs segment.²⁵

16

17 One increasingly popular method of engagement continues to be Toronto Hydro's
18 redesigned CSS portal, which is available to both residential and commercial customers.
19 The portal offers live chat with a Toronto Hydro representative, automated move-in and
20 move-out capability, eBill and pre-authorized debit registration, and the ability to view
21 bill and payment histories. Eligible customers can also opt into outage notifications via
22 email and text message. In addition, the utility redesigned its website to increase traffic
23 and increase customers' ease of access to commonly requested information when they
24 visit the site. This redesign consisted of expanding the "My Usage" page on the CSS portal
25 to provide customers the ability to track and compare their electricity usage and costs on

²⁴ Ontario Regulation 633/21 under the *Electricity Act, 1998*, SO 1998, c. 15, Sched. A.

²⁵ *Supra* note 21.

1 an hourly, daily, monthly, and yearly basis. Furthermore, customers are able to access a
2 price comparison tool to help make an informed decision when selecting between tiered,
3 standard time of use, and the new ULO time of use electricity pricing plans.

4

5 In 2022, Toronto Hydro launched a mobile application to offer another channel for
6 customers to receive customized service based on their preferences. The mobile
7 application supports core customer inquiries such as viewing their bills and payment
8 history, addition to supporting transactions such as moves, eBill registration, and changes
9 in pricing plans. The utility promotes the adoption of this channel through marketing
10 campaigns and the Contact Centre as a means to increase customer convenience and
11 operational efficiency. Enabling customers to self-serve reduces the volume of
12 interactions with live agents and manually initiated processes, which increases
13 operational efficiency.

14

15 The Customer Experience function's increased focus on improving customer service and
16 meeting customers' expectations through the adoption of modern technology will
17 support the identification and implementation of additional services that align with the
18 changes in customers' needs and expectations. For example, current items under
19 consideration include offering enhanced bill prediction tools and alerts, online payment
20 options, proactive notifications, and expanding existing capabilities to support customers
21 in making an informed decision when choosing between different pricing options.

22

23 **7.1.4 Quality Assurance**

24 The Quality Assurance function manages knowledge and service quality, the analysis and
25 evaluation of staff performance, and the analysis of escalation trends and post-call
26 customer survey results. The function develops and distributes training materials for

1 internal and external resources, and focuses on exceeding the OEB-mandated service
2 quality requirements by identifying training gaps, and process and technology
3 improvement opportunities. The function is also responsible for maintaining knowledge
4 base tools to support staff with information on current policies, procedures, and changes
5 to legislative and regulatory requirements. This helps staff to better serve customers and
6 develop effective change management strategies to support the launch of new initiatives
7 and technologies.

8

9 The criticality of this team will grow throughout the 2025-2029 rate period, as its role
10 expands in two areas: 1) the upskilling of staff to support the enhancement of business
11 processes in response to the evolution of customer needs and preferences and industry
12 trends, and 2) the expansion of quality assurance beyond staff and into the fine-tuning of
13 systems and technology.

14

15 As mentioned earlier, customers engage in a broad variety of decarbonization and
16 electrification activities such as the adoption of EVs, elimination of natural gas and other
17 fossil fuels for heating and other needs, the installation of distributed generation and
18 energy storage equipment, the demands on Toronto Hydro staff will greatly increase and
19 the engagements with customers will become materially more complex and diverse. The
20 Quality Assurance function will need to design, build, and maintain knowledge programs
21 to prepare staff on how to respond effectively to these types of inquiries.

22

23 Second, Toronto Hydro expects the role of the Quality Assurance function to evolve as
24 new technologies and tools such as artificial intelligence, machine learning, and process
25 automation are introduced to the organization. In addition to coaching staff to provide
26 high-quality responses to emerging needs and demands of customers, the team will also

1 need to “train” systems to perform in a similar fashion by completing necessary upgrades
 2 or adopting new technology.

3
 4 **Customer Relationship Management Segment Costs**

5 Table 6 below presents Toronto Hydro’s Historical (2020-2022), Bridge (2023, 2024), and
 6 Forecast Year (2025-2029) costs relating to the Customer Relationship Management
 7 Segment:

8
 9 **Table 6: Customer Relationship Management Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Customer Relationship Management	11.4	11.4	12.1	14.4	15.1	14.7	15.7	16.1	16.9	17.5

10
 11 The proposed level of segment funding is required to support the development of human
 12 resources, implement process enhancements, and utilize technologies to meet
 13 increasingly more complex customer needs in an evolving electricity sector. Building
 14 knowledge systems to support frontline customer service representatives and
 15 streamlining internal knowledge networks will be essential to responding effectively to
 16 enquiries related to emerging topics such as EVs, DERs, and associated public policy
 17 initiatives. Automating customer contact points to provide efficient and consistent
 18 customer support will require support from self-service portals, artificial intelligence, and
 19 machine learning systems as they are integrated into the customer experience. The
 20 proposed level of funding is necessary to mitigate several segment-level risks, including
 21 the potential for:

- 22 • Backlogs of customer account updates resulting in delays in issuing bills and
 23 additional work to correct billing errors, increasing risk of non-compliance with
 24 the OEB -prescribed billing accuracy metric;

- 1 • Extended wait times to resolve calls and written inquiries, potentially leading to
2 the erosion of service level standards and lower customer satisfaction as well as
3 increasing risk of non-compliance with OEB-prescribed call response and written
4 response metrics;
- 5 • Compromised ability to enroll customers in, and educate them on, existing and
6 new energy and public policy programs, leading to lower engagement and
7 program success;
- 8 • Reduced ability to invest in modern technologies, staff capacity, and time to
9 provide customers with meaningful insights, tools, and services in an environment
10 of evolving customer expectations; and
- 11 • Limited support as customers navigate an increasingly complex energy
12 environment, leading to less customer control over their energy usage than would
13 otherwise be achieved.

14

15 **7.3 Customer Relationship Management Segment Year-over-Year Variance Analysis**

16 2020 – 2021 Variance Explanation

17 Costs remained flat with increases in contracted services for business process services,
18 IT consulting for CIS project support, and temporary staff, offset by decreases in payroll
19 and labour costs due to vacancies.

20

21 2021 – 2022 Variance Explanation

22 Costs increased by \$0.7 million due to the following reasons:

- 23 • \$0.4 million increase in payroll to fill vacant positions and annual increases in
24 compensation ;
- 25 • \$0.8 million decrease in labour costs associated with the transfer of staff to the
26 CIS upgrade project;

- 1 • \$0.3 million increase in contracted services costs for temporary staff to backfill
2 staff on the CIS upgrade project;
- 3 • \$0.2 million increase in consulting costs to support the CIS upgrade project, and
4 • \$0.6 million increase in cost for contracted business process services, including the
5 impacts of the minimum wage increase.

6

7 2022 – 2025 Variance Explanation

8 Between 2022 and 2025, costs in this segment are expected to increase by \$2.6 million
9 due to the following reasons:

- 10 • increase in payroll costs to fill vacant positions and compensation increases,
11 • increase in labour costs as staff return from the CIS upgrade project to support
12 operations, and
13 • decrease in contracted services costs and software and consulting fees due to
14 the efficiency gains expected from the CIS upgrade project.

15

16 2025 – 2029 Variance Explanation

17 Between 2025 and 2029, costs in this segment are expected to increase by \$2.8 million,
18 to maintain the resourcing capacity and capabilities required to support the increased
19 volume and complexity of work discussed above. If Toronto Hydro were forced to
20 deliver this segment with a reduced level of funding over the 2025-2029 rate period, the
21 utility could face various legal compliance risks and drawbacks, including:

- 22 • Insufficient or inadequate level of resources to provide timely and effective
23 responses to customer inquiries;
- 24 • Reduced ability to implement public policy initiatives and legislative and
25 regulatory requirements in accordance with mandated timelines or in a cost-
26 effective manner;

- 1 • Inadequate ability to research, analyze, and respond to future changes in
- 2 customers' preferences; and
- 3 • Inability to support customers' preferences and provide personalized service
- 4 through large scale technology projects such as omnichannel communication, AMI
- 5 2.0, and customer relationship management.

1 **HUMAN RESOURCES, ENVIRONMENT AND SAFETY**

2

3 **1. OVERVIEW**

4 **Table 1: Human Resources, Environment and Safety Program Summary**

Fleet and Equipment Program Summary									
Outcomes: Public Policy Responsiveness, Environment, Operational Effectiveness - Safety, Financial Performance									
Segments:									
<ul style="list-style-type: none"> • Environment, Health & Safety • Human Resources Services & Systems, Organizational Effectiveness & Employee Labour Relations • Talent Management, Change Leadership & Sustainability 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
15.5	17.6	16.7	18.9	21.3	22.6	23.2	24.2	25.3	26.3

5

6 The Human Resources (“HR”), Environment and Safety program (the “Program”) provides
 7 broad human resource management services to Toronto Hydro. The Program’s activities
 8 manage the employee lifecycle through the processes of employee recruitment,
 9 compensation and benefits, onboarding, performance management, training and
 10 leadership development, labour relations, employee communications and engagement,
 11 and human resources technology management. All of these activities are carried out
 12 within a culture of ensuring employees’ health and safety and environmental
 13 sustainability. The delivery of these activities is tailored to the utility’s complex capital
 14 program and operating environment, labour dynamics and workforce demographics.

15

16 To achieve these outcomes, adequate funding and staffing for the Program will be crucial
 17 to the utility’s success.

1 **2. OUTCOMES AND MEASURES**

2 **Table 2: Human Resources, Environment and Safety Program Outcomes and Measures**

3 **Summary**

Public Policy Responsiveness	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s public policy responsiveness objectives by ensuring regulatory and legislative requirements are met in relation to employee training, collective bargaining and the development of utility-wide policies.
Environment	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s environmental objectives and Net Zero 2040 commitment by: <ul style="list-style-type: none"> ○ Integrating environmental, social and economic issues into planning; ○ Measuring greenhouse gas (“GHG”) emissions, waste reduction, and promoting recycling and a culture of conservation; ○ Ensuring compliance with legislative and regulatory requirements such as the <i>Environmental Protection Act, 1990</i>¹.
Operational Effectiveness – Safety	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s health and safety objectives, measured through metrics like Total Recordable Injury Frequency (“TRIF”) by: <ul style="list-style-type: none"> ○ Implementing controls to reduce the risks associated with exposure to hazards and ensure employees are working safely; ○ Providing training on workplace safety to employees; ○ Closing gaps associated with audit and inspection findings; and • Ensuring compliance with legislative requirements.

¹ RSO 1990, c E.19. [*“Environmental Protection Act”*].

Financial Performance	<ul style="list-style-type: none">• Contributes to Toronto Hydro’s total cost and efficiency measures through the development and delivery of virtual training and internal training facilitation to reduce reliance on external services.• Focuses Toronto Hydro’s workforce on work aligned with organizational objectives by utilizing a rigorous performance management system, thereby decreasing costly wasted productive time.• Promotes processes that decrease Workplace Safety & Insurance Board premiums and other costs.
------------------------------	--

1

2 **3. PROGRAM DESCRIPTION**

3 The Program provides broad human resource management services to Toronto Hydro.
4 The Program’s activities enable the utility to maintain a robust and effective work
5 environment, the health and wellness of its employees, and its safety management
6 system. The Program also supports the utility’s sustainability activities and the promotion
7 of good working conditions to increase employees’ job satisfaction, facilitate productivity
8 and promote innovation.

9

10 The Program’s activities support key operational goals by deploying technology solutions,
11 applying risk-based management system standards, and supporting effective training,
12 diligent inspections, and appropriate investigations into incidents and near misses.
13 Toronto Hydro’s business operations and dense urban environment create a number of
14 distinct challenges for the Program, including:

- 15 • A complex and rapidly evolving distribution system that includes an asset-
16 intensive downtown distribution network;
- 17 • Mature and diverse grid infrastructure featuring legacy assets that require
18 specialized asset management skills (e.g. box construction and paper insulated
19 lead covered cable);

- 1 • An increasingly complex mix of load consumers and distributed energy resources
2 of varying sizes, driving the need for a broad range of advanced customer service,
3 data analysis, strategic planning, and technological know-how skills; and
4 • Unique safety challenges for executing work.

5

6 These challenges drive Toronto Hydro to maintain a high standard of health and safety
7 requirements and provide comprehensive training and apprenticeship programs for
8 employees. These challenges also make it important for Toronto Hydro to prepare talent
9 to fill future key roles so that leaders can continue to be responsive to the utility's
10 operating conditions.

11

12 The Program includes three segments, each described in detail below:

- 13 • Environment, Health & Safety;
14 • Human Resource Services & Systems, Organizational Effectiveness & Employee
15 Labour Relations; and
16 • Talent Management, Change Leadership & Sustainability.

17

18 The objective of the Environment, Health & Safety ("EHS") segment is to ensure that
19 Toronto Hydro operates in a safe, environmentally responsible, and sustainable manner.
20 Toronto Hydro achieves these operational objectives by implementing programs,
21 procedures, safe work practices, and engineering and administrative controls as required.
22 This segment also ensures that Toronto Hydro complies with applicable legislative
23 requirements pertaining to health and safety, environmental protection and
24 sustainability.

1 The objective of the Human Resource Services & Systems, Organizational Effectiveness &
2 Employee Labour Relations segment is to effectively manage labour relations with the
3 utility's employees, compensate employees appropriately and provide benefits to
4 support employee health and well-being. Activities within this segment include
5 interpreting, administering and negotiating collective agreement provisions, case
6 management, performance management, productivity measurement, designing and
7 administering the utility's compensation and benefits program, and administering
8 technology systems to support human resources, environment and safety data.

9

10 This segment also includes a program to foster innovation and another program to track
11 the benefits of initiatives undertaken by the utility. In addition, this segment supports the
12 organization to ensure workplace issues are addressed promptly and in compliance with
13 applicable legislation, policies, and collective agreements. This segment oversees all
14 employee engagement events, including Toronto Hydro's annual United Way campaign.
15 It also manages all internal communications to employees, including the semi-annual
16 publication of the utility's company magazine, Spectrum.

17

18 The objective of the Talent Management, Change Leadership & Sustainability segment is
19 to develop and execute the utility's workforce staffing and development plans and
20 conduct organization design and job design activities, to support the organization's talent
21 development and succession planning processes and programs. Teams in this segment
22 are responsible for internal and external staffing selection. They also create and
23 implement a variety of training, development, and change management initiatives to
24 ensure Toronto Hydro employees are qualified and have the necessary skills, resources,
25 and tools to successfully execute their role.

1 **4. PROGRAM COSTS**

2 In 2025 Toronto Hydro requires \$22.6 million in rate funding for Human Resources and
 3 Safety program, which represents an increase of \$7.1 million over the last Custom
 4 Incentive Risk application in 2020. When normalized for shared services recoveries
 5 outlined in Exhibit 4, Tab 5, Schedule 1, the expected increase in this program is \$6.1
 6 million.

7
 8 Over the 2025-2029 rate period, the utility expects the cost of this program to increase
 9 by annual growth rate of 3.9 percent which is necessary to address the program needs
 10 and deliver the customers outcomes enabled by this program. The Historical (2020-2022),
 11 Bridge (2023-2024), and Forecast (2025-2029) expenditures for each segment are
 12 summarized in Table 3 below.

13
 14 **Table 3: Human Resource and Safety Program Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Environment, Health & Safety	2.4	2.3	2.4	3.0	3.1	3.3	3.4	3.6	3.8	3.9
Human Resource Services & Systems, Organizational Effectiveness & Employee Labour Relations	5.9	6.3	5.9	8.0	9.4	10.0	10.4	10.8	11.3	11.8
Talent Management, Change Leadership & Sustainability	7.2	9.0	8.4	7.9	8.8	9.3	9.4	9.8	10.2	10.6
Total	15.5	17.6	16.7	18.9	21.3	22.6	23.2	24.2	25.3	26.3

15

16 **4.1 Cost Drivers**

17 The cost increases are primarily a result of:

- 18 • **Increasing Capacity to Support Investment Plan:** Staffing changes to support
 19 projects and to fill vacancies have created yearly variances in actual and budgeted
 20 segment costs. These are outlined in the sections below. Payroll costs are

1 expected to increase by approximately \$2.1 million in 2024 and \$1.3 million in
2 2025. These variances are driven by headcount increases to attract, recruit and
3 train talent, to support grid and technology modernization efforts, capital and
4 operating programs and environment, social and governance and compliance
5 activities; and

- 6
- 7 • **Legal and arbitration related expenses:** Legal expenses associated with grievance
8 arbitrations, and other employment related legal matters have trended upwards
9 in the Program. These expenses vary based on the matter's complexity, the
10 number of internal and external witnesses, and the degree of preparation and
11 legal research required. An increase in headcount in bargaining unit positions is
12 expected to increase the volume of arbitration and grievance matters. Both PWU
13 and Society IT collective agreements will be renegotiated during the next rate
14 application which will drive additional legal costs.

15

16 **4.2 Cost Control and Productivity Measures**

17 *4.2.1 Cost Management*

18 Toronto Hydro has implemented or is in the process of executing the following initiatives
19 to realize cost savings:

- 20 • Using services, including specialized software, to collect and report data on
21 incidents, inspections, audits, and facilitate contractor prequalification screening;
- 22 • Optimizing training by leveraging digital tools to facilitate sessions, clustering
23 training in concentrated blocks of one to two weeks to minimize operational
24 disruption; engaging internal resources, familiar with Toronto Hydro systems,
25 processes and equipment, to complete program development, testing, audits and
26 completion of applications;

- 1 • Toronto Hydro has completed a proof of concept for virtual reality training. This
2 training would offer employees a safe environment to learn and develop skills
3 prior to executing them in a physical environment. A request for proposal is
4 currently underway to select a vendor for this solution. This technology will
5 decrease the time required for employees to travel to training, and the time
6 required to deliver training; and
- 7 • Using existing internal resources instead of hiring specialized external service
8 providers to develop and distribute EHS related communications materials
9 including posters, Toronto Hydro TV and safety meeting materials; This results in
10 a cost savings associated with not having to hire external service providers to
11 complete this work.

12

13 The utility has negotiated a five-year collective agreement with the Power Workers’ Union
14 (“PWU”) (2022-2027) and a four-year agreement with the Society of United Professionals
15 (“Society”) (IT) (2021-2025). These agreements will provide labour stability and
16 predictability around compensation and benefits costs.

17

18 4.2.2 *Productivity*

19 The Program has enabled the utility to achieve significant and sustained productivity
20 outcomes. For example, from 2018 to 2022, the utility achieved improvements relating
21 to:

- 22 • Occupational safety, including a 43 percent improvement in total recordable
23 injury frequency;
- 24 • A 94 percent improvement in lost time severity; and
- 25 • The corporate attendance number remained stable, with an improvement of 1.9
26 percent.

1 The above was achieved despite the effects of the COVID-19 pandemic. Toronto Hydro's
2 absenteeism rate remains much lower than historic rates, both within the organization
3 and broader industry. Toronto Hydro has been able to effectively manage employee
4 absenteeism and ensure the workforce is productive and engaged.

5

6 Toronto Hydro's implementation of the cloud-based Success Factors program has
7 supported the business processes and innovation. The foundational design integrates
8 between modules and facilitates automation of workflows. The integrated solution
9 supports the employee life cycle starting with the foundation of 'Employee Central',
10 which houses core employee information from job to organizational data. The core
11 employee data is integrated with other modules within Success Factors such as
12 recruitment, on-boarding, performance management, learning, benefits and
13 compensation. The integration has expanded the capture of master data, increased data
14 accuracy and operational efficiencies. The system has enabled employees to self-serve,
15 allowing employees access to manage their own personal data such as home address,
16 phone number and emergency contact, increasing overall data accuracy. The technology
17 also supports other systems in the organization through integration, feeding real-time
18 employee master information such as job and organizational data. The cloud solution has
19 annual releases of new features to expand system functionalities and optimize business
20 processes.

- 21 • Toronto Hydro has upgraded the video and audio-conferencing applications of its
22 work centres, making remote and hybrid work more effective and reducing the
23 facilitation costs of virtual learning and training programs.
- 24 • Electronic dashboards are used by crews to complete a risk assessment digitally
25 prior to their work as part of developing a safe job plan have increased
26 productivity. This electronic tool allows leaders to access job planning details

1 without having to be on site. Moving from what was previously a paper process
2 to an electronic process has resulted in improved data analytics and auditing
3 capabilities and increased job planning quality, which has contributed to a
4 decrease in injuries. Recordable injury performance has improved by 16 percent
5 in the year following the introduction of the electronic tailboard and the utility
6 has not had any critical or fatal injury since the electronic tailboard was launched.

- 7 • A new Employee and Labour Relations solution was implemented in 2022 to
8 streamline the administration and tracking of grievances, arbitrations and to
9 facilitate contract negotiations through system integration and automation.
10 Leveraging the SuccessFactors foundation, an integration was built to pull real-
11 time employee data such as job and organizational data to effectively manage a
12 centralized employee labour relations system. Some of the features included
13 automation of the Collective Agreement, ease of updating clauses and consistent
14 policy interpretation.

15 16 **5. ENVIRONMENT, HEALTH & SAFETY SEGMENT**

17 **5.1 Segment Description**

18 The Environment, Health & Safety (“EHS”) segment ensures that Toronto Hydro operates
19 in an environmentally conscious manner and implements programs, procedures, safe
20 work practices, and engineering and administrative controls to provide a healthy and safe
21 working environment for employees.

22
23 The activities performed as part of this segment are instrumental to ensuring that the
24 utility complies with legislative and regulatory requirements. The EHS segment executes
25 operational activities, prepares the planning and delivery of targeted initiatives and
26 executes applicable internal and external reporting requirements. The work performed

1 within this segment is carried out 24 hours a day, 7 days a week in line with Toronto
2 Hydro's service obligations. Functions within this segment include Health Services and
3 Environment, Health and Safety.

4
5 *5.1.1 Health Services*

6 Toronto Hydro's health services function effectively processes and monitors occupational
7 and non-occupational health and injury claims. Health services supports injured
8 employees receiving appropriate treatment and recovery measures, and encourages their
9 participation in the workplace within their prescribed restrictions until they can safely
10 return to their pre-injury role. Health services also manages short and long-term disability
11 cases. As a result of these efforts, Toronto Hydro achieved a 94 percent improvement in
12 its lost time severity from 2018 to 2022.

13
14 During the pandemic Health Services played a significant role in supporting the utility's
15 successful response to COVID-19 through the implementation of the infectious disease
16 plan. This included the development and implementation of protocols for reporting
17 illness, returning to work, contact tracing, health screening as well as organizing
18 vaccination clinics for employees. This contributed to the company maintaining a healthy
19 and safe environment for employees, including no substantiated cases of workplace
20 transmission since the onset of the pandemic.

21
22 *5.1.2 Environment, Health and Safety*

23 Environment, Health and Safety ("EHS") activities include the following:

- 24
- 25 • **Environment, Health & Safety Management Systems ("EHSMS"):** The EHSMS
26 improves the efficiency of activities within this segment. The EHSMS system also
facilitates Toronto Hydro's compliance with applicable legislative and regulatory

- 1 requirements such as the *Utility Work Protection Code*², *Electrical Utility Safety*
2 *Rules*³, and *Occupational Health & Safety Act, 1990* and Regulations.⁴ In
3 addition, the EHSMS provides a mechanism for mitigating risk and achieving
4 corporate objectives relating to health, safety, and environmental performance.
5 The EHSMS established the frameworks (such as contact tracing) to successfully
6 manage the COVID-19 Pandemic;
- 7 • **EHS Framework:** Toronto Hydro coordinates all EHS activities in accordance
8 with internationally recognized ISO standards. Toronto Hydro is certified in
9 conformance with ISO 14001:2015 and ISO 45001:2018, both of which are
10 internationally recognized EHS standards requiring third-party audits. In line
11 with these certifications, Toronto Hydro has implemented a framework that
12 incorporates effective risk management and continual improvement to support
13 occupational health and safety performance and prevent employee illness and
14 injuries;
 - 15 • **Occupational Health and Safety Activities:** Toronto Hydro implements robust
16 occupational health and safety training programs. These programs maintain the
17 long-term health, safety and wellness of the utility’s workforce. The utility
18 continually improves these programs by developing action plans to address
19 identified gaps from investigation and audit activities. Our recordable injury
20 performance has improved by 43 percent since 2018 and we have not had any
21 critical or fatal incidents since that time; and
 - 22 • **Environmental, Social and Governance (“ESG”):** The internationally recognized
23 guidance document ISO 26000:2010 informs Toronto Hydro’s approach to social
24 responsibility. In line with this document, Toronto Hydro has integrated the

² Ontario Infrastructure Health and Safety Association, Utility Work Protection Code.

³ Ontario Infrastructure Health and Safety Association, Electrical Utility Safety Rules.

⁴R.S.O. 1990, c. O.1. [“Occupational Health and Safety Act”]

1 promotion of social responsibility into its core values, processes, and
2 operations.⁵ Toronto Hydro has leveraged this guidance document together
3 with elements of the EHS management system to develop and implement a
4 consolidated ESG strategy. The utility's ESG activities and performance have
5 been recognized with 10 ESG-related awards since 2018.⁶

6

7 EHS complies with applicable environmental legislation and regulations such as the
8 *Environmental Protection Act, 1990*⁷ and the utility's environmental policy by delivering a
9 number of environmental protection and compliance programs, such as:

- 10 • Environmental spill response, cleanup, investigation and reporting;
- 11 • Delivery of prescribed environmental training (e.g. Transportation of Dangerous
12 Goods);
- 13 • Maintenance of environmental permits for equipment that discharges
14 contaminants into the atmosphere;
- 15 • Registering Hazardous waste streams and reporting waste management
16 activities with the Ontario Ministry of the Environment, Conservation and Parks;
17 and
- 18 • Internal and External Reporting, including internal and external reporting on
19 EHS performance; external reporting including mandatory reports and
20 notifications to the City of Toronto, the Ministry of Labour, Immigration,
21 Training and Skills Development, the Work Safety and Insurance Board, the
22 Ontario Ministry of the Environment, Conservation and Parks, and Environment
23 and Climate Change Canada and Electricity Canada.

⁵ Adherence to this ISO 26000 standard is required for the utility's continued maintenance of its Sustainable Electricity Company designation from Electricity Canada.

⁶ Toronto Hydro has been recognized by Corporate Knights, Electricity Canada, Centre of Excellence and Canadian Occupational Safety Magazine.

⁷ *Supra* note 2.

1 **5.2 Environment, Health & Safety Segment Costs**

2 Table 4, below, provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 3 (2025-2029) expenditures for the EHS segment.

4
 5 **Table 4: Environment, Health & Safety Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Environment, Health & Safety	2.4	2.3	2.4	3.0	3.1	3.3	3.4	3.6	3.8	3.9

6

7 The cost increases are primarily attributable to filling employee positions in order to
 8 support the safe execution of the utility’s capital work program and inflationary
 9 pressures.

10

11 **5.3 Environment, Health & Safety Segment Year-over-Year Variance Analysis**

12 2020-2021 Variance Explanation

13 From 2020 to 2021, costs decreased by \$0.1 million due to delays in hiring as a result the
 14 COVID-19 pandemic.

15

16 2021-2022 Variance Explanation

17 From 2021 to 2022, costs increased by \$0.1 million, due to an increase in hiring that had
 18 been previously postponed due to the COVID-19 pandemic.

19

20 2022-2025 Variance Explanation

21 From the 2022 actual to 2025, costs are expected to increase by \$0.9 million. This increase
 22 is required to increase capacity and capabilities to perform the hiring necessary to
 23 facilitate the safe execution of the utility’s 2025-2029 investment plan.

1 2025-2029 Variance Explanation

2 Between 2025 and 2029 costs in this segment are expected to increase by \$0.6 million, or
3 an average of \$0.2 million per year. If the utility does not receive the funding it requires
4 to execute this segment as described, Toronto Hydro could be exposed to a number of
5 risks, including:

- 6 • Injuries, illnesses or fatalities to employees due to occupational health and
7 safety hazards;
- 8 • Stop work orders, which would halt the execution of the utility's capital work
9 program.
- 10 • An increased likelihood of safety-related incidents, including critical injuries or
11 fatalities to Toronto Hydro employees;
- 12 • An increased likelihood of incidents with a negative environmental impact or
13 worsening environmental performance;
- 14 • Legislative or regulatory non-compliance because of inadequate training and
15 resources to provide advice, consultation, and research on matters relating to
16 employment and labour relations, safety, and the environment.

17
18 **6. HUMAN RESOURCES SERVICES & SYSTEMS, ORGANIZATIONAL EFFECTIVENESS &**
19 **EMPLOYEE LABOUR RELATIONS SEGMENT**

20 **6.1 Segment Description**

21 This segment delivers Human Resources services and leverages technology solutions to
22 support the utility's employment life cycle. Its activities also drive effective performance
23 management through ensuring market competitive compensation and benefits and
24 overseeing employee and union relations.

25 Functions within this segment include:

- 26 • Employee and Labour Relations;

- 1 • Employee Engagement and Communications;
- 2 • Compensation and Benefits;
- 3 • Performance Management and Productivity;
- 4 • Innovation, and
- 5 • HR Systems and Data Governance.

6

7 6.1.1 *Employee and Labour Relations*

8 The Employee Labour Relations (“ELR”) function manages issues relating to employee and
9 labour relations and employee compliance with legislative and regulatory requirements,
10 corporate policies and collective agreement provisions. ELR also supports Toronto
11 Hydro’s unionized and non-unionized work groups by ensuring that the utility follows all
12 applicable labour and employment related legislation, policies, and collective agreement
13 requirements.

14

15 This work requires labour relations and legal professionals to provide advice, guidance,
16 and support on how to address challenges, and where necessary, assist in preparing for
17 dispute resolution. This dispute resolution can include grievance arbitration, civil
18 employment claims, Ontario Labour Relations Board matters, and human rights claims.

19 Toronto Hydro has a diverse workforce that includes both unionized and non-unionized
20 employees. Over half of Toronto Hydro’s employees belong to a union. There are two
21 unions at Toronto Hydro – the Power Workers’ Union (PWU) and the Society of United
22 Professionals. Unionized employees are organized into four bargaining units. Inside
23 workers and outside workers are represented by the PWU, and information and
24 technology employees and professional engineers are represented by the Society of
25 United Professionals.

1 6.1.2 *Employee Engagement and Communications*

2 The Employee Engagement and Communications function provides employees with
3 awareness of important and key messages through multiple channels such as, company
4 intranet, mass communications, pulse surveys, posters, employee magazine, and in-
5 person gatherings. This function also oversees all employee events including the annual
6 United Way campaign.

7
8 6.1.3 *Compensation and Benefits*

9 This function oversees and administers Toronto Hydro’s workforce compensation
10 strategy and practices. This function is critical to maintaining a workforce that is skilled,
11 adaptable, committed, and performance-driven within a tight labour market. Toronto
12 Hydro strives to achieve these key outcomes in a financially responsible manner by
13 providing employees with a competitive total reward offering. This function compensates
14 employees for contribution to individual, divisional, and corporate performance goals. For
15 more information on Toronto Hydro’s compensation and benefits program.⁸

16
17 6.1.4 *Performance Management and Productivity*

18 Toronto Hydro utilizes a Management Control and Reporting System (“MCRS”) which sets
19 forth a disciplined methodology to forecast, plan, control and report on its processes in
20 order to keep focused on organizational objectives and continually improve.

21 Every year, Toronto Hydro reviews its corporate objectives in light of organizational
22 priorities and updates its balanced scorecard to ensure appropriate targets are set. The
23 same is done at the divisional and department level to result on a fresh slate of objectives
24 at the beginning of each year, where progress is then reported out on a monthly basis.

⁸ Exhibit 4, Tab 4, Schedule 4.

1 The performance management process also provides employees and managers with
2 multiple opportunities to set individual goals throughout the year that are aligned with
3 corporate objectives and outcomes. This ensures that employees understand their job
4 expectations and how their roles support the utility's strategic objectives.⁹ There is
5 ongoing feedback to ensure project deadlines and goals are achieved. All employees are
6 coached on aligning individual and organizational outcomes.

7

8 This rigorous performance system has become instrumental to Toronto Hydro's success
9 in the face of challenges to the utility such as COVID-19 and extreme weather. Looking
10 forward, this performance system will help the organization adopt new technologies and
11 support new ways of operating (e.g. distributed energy resources) through setting
12 evidence based goals, tracking progress and having past results inform future goals.

13 This function also includes various productivity initiatives such as LEAN and 5S (a subset
14 of LEAN pertaining to workspace organization) which have allowed for the elimination of
15 waste from printing rooms to warehouse environments.

16

17 *6.1.5 Innovation*

18 Further to the performance systems, Toronto Hydro also has an "Innovation @ Toronto
19 Hydro" program which sets aside an annual budget to incubate and bring employee
20 innovation to life. Projects with a completed proof of concept to-date include virtual
21 reality training and implementation of project management software.

22

23 *6.1.6 HR Systems and Data Governance*

24 The HR Systems and Data Governance function supports the organization's technology
25 needs with respect to employee data. The team oversees all HR related technology

⁹ Exhibit 1B, Tab 2, Schedule 1.

1 solutions and develops the utility’s long term system plan. This function conducts a
 2 regular review of systems to identify opportunities to optimize functionality and maximize
 3 benefits. SuccessFactors has enabled the utility to integrate and automate management
 4 of the employee life cycle from hire to retire.

5

6 **6.2 Human Resources Services & Systems, Organizational Effectiveness & Employee**
 7 **Labour Relations Segment Costs**

8 Table 5, below, provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 9 Year (2025-2029) expenditures for the Human Resource Services and Employee Relations
 10 segment.

11

12 **Table 5: Human Resources Services & Systems, Organizational Effectiveness &**
 13 **Employee Labour Relations Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Human Resource Services & Systems, Organizational Effectiveness & Employee Labour Relations	5.9	6.3	5.9	8.0	9.4	10.0	10.4	10.8	11.3	11.8

14 **6.3 Human Resources Services & Systems, Organizational Effectiveness & Employee**
 15 **Labour Relations Segment Year-over-Year Variance Analysis**

16 2020 – 2021 Variance Explanation

17 Costs increased by \$0.4 million from 2020 to 2021 due to inflationary pressures.

18

19 2021 – 2022 Variance Explanation

20 Costs decreased by \$0.4 million from 2021 to 2022 due to hiring plan adjustments.

1 2022 – 2025 Variance Explanation

2 From 2022 to 2025, costs are expected to increase by approximately \$4.1 million due to
3 reorganization within the HR, Environmental & Safety division to align leadership and
4 support delivery on current and upcoming organizational operational strategies and
5 strategic projects. This reorganization will support the following outcomes:

- 6 • Support for the SAP S4 HANA upgrade as outlined in Exhibit 2B, section E8.4,
7 specifically for the component associated with human resources data, including
8 timekeeping and employee master data systems;
- 9 • Increased headcount due to the delay in hiring from the pandemic;
- 10 • Support succession planning and development within the division; and
- 11 • Support the Human Resources, Environment and Safety division in the rate
12 application.

13
14 2025 – 2029 Variance Explanation

15 Between 2025 and 2029 costs in this segment are expected to increase by \$1.8 million, or
16 an average of \$0.5 million per year. If the utility does not receive the funding it requires
17 to execute this segment as described, Toronto Hydro could be exposed to a number of
18 risks, including:

- 19 • Insufficient resources to monitor, advise, and enforce compliance with the
20 utility's legislative and regulatory obligations;
- 21 • Insufficient resources to investigate and remedy employment issues such as
22 attendance management, lowering workforce productivity;
- 23 • A lack of competitive and informed total rewards compensation offerings
24 contributing to an inability to attract talent in a tight labour market in a large
25 urban city, as well as losing talent to other utilities, resulting in an insufficient

- 1 workforce to execute the utility's capital program and growth and
2 modernization programs;
- 3 • An inability for the utility to defend itself against civil employment claims,
4 Ontario Labour Relations Board matters, and human rights claims;
 - 5 • A lack of resources to improve the utility's innovation capabilities and a lack of
6 productivity support to run lean programs that decrease organizational waste
7 (e.g. time, materials, etc); and
 - 8 • A lack of modern technology solutions requiring employees to focus more on
9 manual and tedious data work rather than focusing on higher-level value-added
10 work;

11

12 **7. TALENT MANAGEMENT, CHANGE LEADERSHIP & SUSTAINABILITY SEGMENT**

13 **7.1 Segment Description**

14 The Talent Management, Change Leadership & Sustainability segment governs the
15 development and execution of the utility's workforce staffing plan, career succession, and
16 employee development strategies and programs. The primary objective of this segment
17 is to align workforce and culture change strategies to organizational strategies and key
18 competencies for current and future workforce requirements. This enables the
19 advancement of the organization as an employer of choice, builds workforce competence
20 to drive technology, process change and innovation, and enhances leadership skills and
21 competence. Functions within this segment include:

- 22 • Short and long-term workforce staffing and planning;
- 23 • Talent attraction and retention;
- 24 • Succession planning and career development;
- 25 • Organization and job and design;
- 26 • Diversity, equity and inclusion; and

- 1 • Change management systems; training and development.

2

3 7.1.1 *Talent Management*

4 The Talent Management function plans and executes the utility's short and long-term
5 workforce strategy,¹⁰ which includes: (i) mapping the resources that the utility needs to
6 execute its capital plans and operational programs; (ii) analyzing the availability of talent
7 within the utility and in the external labour market; and (iii) understanding the utility's
8 actual and projected turnover rates. This information forms the basis of the utility's
9 workforce strategy. This segment is also responsible for administering collaborations with
10 colleges and universities and its talent attraction strategies.

11

12 The utility has evolved its talent management processes to build a more diverse
13 workforce. Specific plans to support these objectives include creating engagement,
14 communication and educational opportunities to build employees' understanding of
15 unconscious bias and the importance of inclusive leadership. For example, as of June 1,
16 2023, 241 leaders (91 percent) have completed unconscious bias training.

17

18 The utility's Talent Management processes supports a bias and barrier-free recruiting
19 experience. Toronto Hydro is committed to attracting, retaining and promoting qualified
20 individuals to meet its resourcing requirements. Toronto Hydro uses a competency-based
21 selection approach to align candidates to behavioural corporate competencies and
22 technical job specific requirements. This process mitigates operational and safety risks for
23 the organization due to poor hiring decisions.

¹⁰ Exhibit 4, Tab 4, Schedule 3.

1 Toronto Hydro collaborated with George Brown College to develop curriculum for the
2 Electromechanical Engineering Technology – Power and Control Program. Graduates of
3 this program will meet minimum entry qualifications to Power Line Technician,
4 Engineering Technologist, Distribution System Technology, Power System Controller and
5 Certified Meter Mechanic Tester roles. All of these are key certified and skilled trades and
6 designated technical professional roles that support the safe, productive, design and
7 operation of the distribution system. This program was launched in 2021 and
8 demonstrates the utility’s commitment to investing in future talent by giving back to the
9 diverse community it serves. The first graduates of this program will reach the labour
10 market in the spring of 2024.

11

12 Team members from this segment work directly with educational institutions, including
13 George Brown College, to lead the establishment of collaboration outcomes. These
14 include annual goal setting in the areas of curriculum development, training support,
15 recruitment and marketing for current and prospective students, scholarships and awards
16 and work integrated learning program support, and lab equipment upgrades. Expected
17 outcomes for the utility include a ready talent pool versed in relevant knowledge to fill
18 short and long-term workforce needs over the 2025-2029 period.

19

20 *7.1.2 Organization Design*

21 Toronto Hydro’s organization design function collects information on business
22 departments’ functional responsibilities and processes for the purpose of optimizing
23 business functionalities, identifying strategies that enhance existing processes, seeking
24 options to increase workforce flexibility, achieving operational efficiencies and cost
25 savings, and improving overall organizational performance. This function ensures that job
26 roles are clearly defined. This function also assesses the utility’s management systems

1 and operational processes to identify short and long-term talent needs and opportunities
2 and support succession plans at all levels. This organizational design process flows into
3 creating tailored short-term and long-term workforce and leadership requirements to
4 meet the utility's objectives.

5

6 *7.1.3 Change Leadership*

7 The change leadership function enables Toronto Hydro's journey to transform the
8 workforce through key business processes alignment, continual improvement and
9 innovation. In addition, this team supports the people side of change with upskilling,
10 development and engagement and communication as applicable.

11

12 This function also supports the utility's culture change goals with its hybrid work
13 arrangement and its focus on ESG and diversity, equity and inclusion goals. This function
14 further executes strategies to maintain employee engagement and productivity
15 throughout the planning, delivery and sustainment of these projects.

16

17 One example of organizational change at Toronto Hydro has been the development of
18 the "Enterpriser" community across the organization. Enterprisers are a network of
19 approximately 80 employees who are involved as change agents in the business. This
20 cross divisional network has been maintained for five years following the implementation
21 of SAP, and has supported system enhancements, adherence to standards and processes
22 and the learning of employees who are onboarded or transition to new roles.

23

24 *7.1.4 Training and Development*

25 Toronto Hydro provides training and development programs to sustain a qualified and
26 competent workforce. These include an onboarding program to support employees'

1 transitions to new roles, apprenticeship training, leadership, technical, legislative, and
2 Toronto Hydro-specific compliance programs. For example, in 2022, the Sustainability and
3 Training team organized and delivered 655 scheduled classes across 86 distinct training
4 programs. Toronto Hydro primarily develops these programs in-house. This in-house
5 development has accelerated training program development time, increased the quality
6 of training materials, and improved training material maintenance for a lower overall
7 cost. External designers are only used for complex legislative compliance matters or
8 complex technologies such as virtual reality.

9

10 Effective leadership and succession planning are essential to the utility's success. They
11 provide value to Toronto Hydro's customers by driving productivity and efficiency and by
12 protecting the continuity of the utility's operations. Leadership responsibilities include:
13 championing environmental, social and governance programs, training, performance
14 management, employee engagement, coaching and mentoring, and employee
15 development.

16

17 The Sustainability and Training team facilitates these objectives, in conjunction with the
18 performance management program, which allows employees to identify career
19 development goals, specific interests, and any skill or knowledge gaps that they would
20 like to fill. This information is critical to recognizing and developing potential leaders and
21 successors from within the utility and to delivering Toronto Hydro's staffing strategy.¹¹
22 Through well-developed processes for identifying and developing leadership potential,
23 Toronto Hydro has successfully improved leadership bench strength, creating a pool to fill
24 this critical function. Leadership training is provided to employees at all levels of the
25 organization.

¹¹ *Ibid.*

1 Toronto Hydro’s technical training and development programs are an essential resource
2 for meeting all legislative, compliance and utility specific training requirements.
3 Comprehensive training is not only a legislative requirement under the *Occupational*
4 *Health Safety Act, 1990*¹² and other key statutes and codes that govern Toronto Hydro,
5 but it also contributes to higher employee productivity, efficiency and safer operations.
6

7 Toronto Hydro administers four certified apprenticeship training programs :

- 8 • Power Line Technician (“PLT”);
 - 9 • Distribution System Technologists (“DST”);
 - 10 • Power System Controllers (“PSC”); and
 - 11 • Certified Meter Mechanics (“CMM”).
- 12

13 Toronto Hydro also administers two technical training programs: (i) Engineering
14 Technologists; and (ii) Engineers.
15

16 Together, these programs play a key role in facilitating the development and transfer of
17 core knowledge about the complexities of Toronto Hydro’s distribution system and in
18 maintaining the specialized work skills which are critical to the utility’s capital program
19 and operations (e.g. network switching, positive identification of underground cable and
20 lead cable splicing in the underground system). Informal mentorship also occurs,
21 providing experienced employees with an opportunity to share best practices along with
22 greater understanding of the complexities of the utility’s assets.
23

24 Toronto Hydro was granted Training Delivery Agent status by the Provincial training
25 authority to provide training to the utility’s Powerline Technicians. Its other three

¹² *Supra* note 4.

1 apprenticeship programs are structured and designed in a similar fashion with the
 2 objective of developing and maintaining the specialized skills and knowledge that
 3 certified and skilled trades and designated and technical professionals require to work on
 4 Toronto Hydro’s distribution system safely and efficiently.

5

6 **7.2 Talent Management, Change Leadership & Sustainability Segment Costs**

7 Table 6, below, provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 8 Years (2025-2029) expenditures associated with the Talent Management, Change
 9 Leadership & Sustainability segment.

10

11 **Table 6: Talent Management, Change Leadership & Sustainability Segment**
 12 **Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Talent Management, Change Leadership & Sustainability	7.2	9.0	8.4	7.9	8.8	9.3	9.4	9.8	10.2	10.6

13

14 **7.3 Talent Management, Change Leadership & Sustainability Year-over-Year**
 15 **Variance Analysis**

16 2020 – 2021 Variance Explanation

17 From 2020 to 2021, costs increased by \$1.8 million due to:

- 18 • The introduction of additional headcount as additional trainers for the
 19 apprenticeship program in Sustainability & Training;
- 20 • The re-initiation of training programs that were paused in 2020 due to the COVID-
 21 19 pandemic; and
- 22 • Headcount to support programs such as leadership development and corporate
 23 engagement and communication.

1 2021 – 2022 Variance Explanation

2 From 2021 to 2022, costs decreased by \$0.6 million due to hiring plan adjustments.

3

4 2022-2025 Variance Explanation

5 From 2022-2025, costs are expected to increase by \$0.9 million due to:

- 6 • Investments in headcount to support leadership development, diversity equity
7 and inclusion programs and resources to attract and train the talent required to
8 support capital and operational work programs

9

10 2025-2029 Variance Explanation

11 Between 2025 and 2029 costs in this segment are expected to increase by \$1.3 million, or
12 an average of \$0.3 million per year. If Toronto Hydro does not receive the requested level
13 of funding to perform the functions and satisfy the responsibilities identified in this
14 segment, the utility could be exposed to a number of risks, including, a reduced ability to
15 successfully recruit, advance the inclusive culture and develop the skilled and specialized
16 resources that Toronto Hydro requires in the next five years.

1 **FINANCE**

2

3 **1. OVERVIEW**

4 **Table 1: Finance Program Summary**

Finance Program									
Outcomes: Public Policy Responsiveness, Financial Performance									
Segments:									
<ul style="list-style-type: none"> • Controllership • Financial Services • External Reporting 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
16.4	17.9	18.4	20.9	22.9	24.4	26.2	27.6	29.4	31.1

5

6 The Finance Program (the “Program”) supports Toronto Hydro’s operations through
 7 financial planning, management reporting, capital planning and reporting, payroll and
 8 disbursements, corporate tax, treasury, insurance and internal audit as well as external
 9 reporting and financial regulatory and revenue management.

10

11 The Program provides value to customers through the oversight of financial planning
 12 activities that support the utility’s ability to execute long-term and short-term strategic
 13 plans, the appropriate governance of key performance measures such as operating
 14 expenses, regulated capital, in-service assets, net income, investor and stakeholder
 15 engagements, and compliance with applicable statutory and regulatory financial
 16 requirements.

17

18 The Program includes the following three segments:

- 1 • **Controllership:** Encompasses oversight and governance of Toronto Hydro’s
2 financial activities. This includes financial planning, management reporting,
3 capital planning and reporting, and payroll and disbursements.
- 4 • **Financial Services:** Governs the activities permitting Toronto Hydro to meet its
5 financial obligations. This includes treasury, insurance, corporate tax, and internal
6 audit. These functions are integral to contributing to financial compliance and
7 solvency.
- 8 • **External Reporting:** Oversees preparation and compilation of financial reporting
9 materials for external parties, including, but not limited to, the Ontario Energy
10 Board (“OEB”), and the Ontario Securities Commission (“OSC”).

11

12 The Program and its constituent segments are a continuation of the activities described
13 in the Finance program in Toronto Hydro’s 2020-2024 Rate Application.¹

14

15 Functionally, these segments work to support Toronto Hydro’s operations through
16 diligent financial planning, management reporting, capital activities, payroll and
17 disbursements, corporate tax, treasury, insurance, and compliance with internal and
18 external auditing standards.

¹ EB-2018-0165, Exhibit 4A, Tab 2, Schedule 16.

1 **2. OUTCOMES AND MEASURES**

2 **Table 2: Finance Program Outcomes and Measures Summary**

Public Policy Responsiveness	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s public policy responsiveness objectives by: <ul style="list-style-type: none"> ○ Providing accurate and timely reporting pursuant to the OEB’s Electricity Record Keeping Requirements (the “RRR”) and compliance with the Accounting Procedures Handbook (“APH”) by maintaining the necessary processes and controls; and ○ Preparing and issuing quarterly and audited annual financial statements, including the Management Discussion & Analysis (“MD&A”) and Annual Information Form (“AIF”) as required by the OSC and the Canada Revenue Agency (“CRA”).
Financial Performance	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s financial performance objectives by: <ul style="list-style-type: none"> ○ Leading the governance of the DSP Implementation Progress Metric and Financial Ratios as annually reported via the OEB Distributor Scorecard; ○ Meeting the financial obligations and maintenance of compliance requirements imposed by the relevant regulatory bodies and debt holders; ○ Raising capital and providing financial services that enable the uninterrupted continuation of the utility’s capital investments and distribution activities.

3

4 **3. PROGRAM DESCRIPTION**

5 The Program provides financial support to every aspect of Toronto Hydro’s operation
 6 through business planning activities, management reporting, capital planning, payroll
 7 services, accounts payable, internal audits, and other issue-specific functions. It also
 8 enables compliance with statutory and regulatory requirements and reporting
 9 obligations. These requirements primarily relate to the preparation and issuance of
 10 securities-related continuous disclosure information that is completed on a consolidated
 11 basis. Regulatory financial reporting required by the OEB includes quarterly and annual
 12 reporting under the RRR and compliance with the APH.

1 The Program also delivers traditional finance functions such as payroll and disbursement
2 services, treasury, corporate tax, and internal audit that allow Toronto Hydro to meet its
3 short and long-term financial, legal, and legislative obligations to its employees, external
4 suppliers, service providers, debt holders, government agencies, board of directors, and
5 its external auditors. In addition, the Program oversees a number of operational
6 processes (i.e. management reporting and analysis and capital planning and reporting)
7 that monitor the utility's financial performance and support management's ability to
8 make informed, strategic decisions.

9

10 The Program also provides oversight and governance of the utility's business planning
11 activities through the financial planning function. This function is responsible for the
12 assessment and recommendation of short and long-term strategic plans and integration
13 of operational, financial and regulatory plans. The Program also manages the co-
14 ordination and consolidation of the annual budget.

15

16 The activities described above are accomplished via the following three segments:

- 17 • **Controllership:** includes functions such as financial planning, management
18 reporting and analysis, capital planning and reporting, and payroll and
19 disbursements;
- 20 • **Financial Services:** includes functions such as corporate tax, treasury, insurance,
21 and internal audit; and
- 22 • **External Reporting:** includes statutory and regulatory reporting functions such as
23 external reporting and regulatory financial reporting and revenue management.

1 **4. PROGRAM COSTS**

2 In 2025 Toronto Hydro requires \$24.4 million in rate funding for the Finance program,
 3 which represents an increase of \$8 million over the last Custom Incentive Rate Application
 4 in 2020. When normalized for shared services recoveries outlined in Exhibit 4, Tab 5,
 5 Schedule 1, the expected increase in this program is \$7.5 million.

6
 7 Over the 2025-2029 rate period, the utility expects the cost of this program to increase
 8 by an annual growth rate of 6.1 percent which is necessary to address the program needs
 9 and deliver the customers outcomes enabled by this program

10
 11 Table 3, below, provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 12 (2025-2029) expenditures for each of the Program’s segments:

13
 14 **Table 3: Finance Program Expenditures by Segment (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Controllership	6.5	6.9	6.9	7.7	8.8	9.4	10.1	10.5	11.0	11.4
Financial Services	6.7	7.7	8.4	9.3	9.7	10.5	11.4	12.2	13.3	14.4
External Reporting	3.2	3.3	3.1	3.9	4.4	4.5	4.7	4.9	5.1	5.3
Total	16.4	17.9	18.4	20.9	22.9	24.4	26.2	27.6	29.4	31.1

15
 16 **4.1 Cost Drivers**

17 The primary driver of cost increases in the program is compensation cost increases due
 18 to an increase in staffing levels and general compensation increases of existing
 19 employees. As the volume and complexity of Toronto Hydro’s capital investments and
 20 operations increase in the 2025-2029 period, the Program will require a highly skilled and
 21 dedicated workforce to perform all of the Program functions in a timely and effective
 22 manner.

1 Secondly, the Program costs are expected to increase due to higher insurance premiums,
2 reflecting expected cost increases for general and cyber security insurance. The upward
3 trend in insurance costs is attributable to higher premiums on the existing insurance
4 programs of property, liability and cyber insurance policies. In particular, cyber security
5 insurance premiums are increasing in correlation with growing and more acute cyber
6 security threats that affect large organizations such as Toronto Hydro each year.²
7 Additionally, Toronto Hydro's rate base is expected to increase from \$5.2 billion in 2022
8 to \$7.6 billion in 2029 which has a direct impact on the future property and liability
9 insurance premiums.

11 **4.2 Cost Control and Productivity Measures**

12 The Program has undertaken cost control measures over the 2020-2024 plan period to
13 control costs and offset cost increases identified above in Section 4.1. Some of these
14 measures are expected to result in cost savings through the 2025-2029 forecast period.
15 The Program continuously engages in the assessment and review of its processes to
16 explore opportunities to streamline functions and make process improvements.

17
18 Within the controllership segment, some of the examples of these departmental
19 efficiencies include:

- 20 • Process improvement and automation of the payroll processing and disbursement
21 functions resulting in sustained annual savings of \$0.2 million starting in 2021; and
- 22 • Annual cost avoidance of \$0.4 million through the elimination of manual
23 processes and use of technology to automate repetitive tasks starting in 2022.

² Exhibit 4, Tab 2, Schedule 17.

1 These savings of \$0.6 million are forecasted to be sustained for through the bridge years
2 (2023-2024) and forecast years (2025-2029). These forecasted efficiencies enable the
3 segment to maintain the same staffing levels as 2025 through the 2026-2029 forecast
4 years despite the increase in the volume and complexity of the capital and operating work
5 programs.

6

7 **5. CONTROLLERSHIP SEGMENT**

8 **5.1 Segment Description**

9 The controllership segment provides oversight and governance of Toronto Hydro's
10 financial planning activities, timely and accurate financial information and support to
11 Toronto Hydro's senior management and operational business units. This segment also
12 allows the utility's financial reports to meet both statutory and regulatory financial
13 reporting requirements. The controllership segment leverages knowledge of operational
14 processes to produce accurate and relevant financial information, and provides
15 appropriate financial context for decision making by the operational business units and
16 senior management. This segment is crucial to enabling senior management to make
17 informed decisions, and for monitoring and analyzing the utility's financial performance
18 against short-term goals, long-term plans and regulatory filings. The activities comprising
19 this segment encompass the following functions: (i) financial planning; (ii) management
20 reporting and analysis; (iii) capital planning and reporting; and (iv) payroll and
21 disbursements. Further details about these activities are below.

22

23 *5.1.1 Financial Planning*

24 The financial planning function provides centralized oversight and governance of the
25 utility's financial planning activities including the assessment and recommendation of
26 long-term strategic plans and the integration of operational, financial, and regulatory

1 plans. This function coordinates the development and execution of the utility's annual
2 budget, long-term financial projections, and support for electricity distribution rate
3 applications. The group leverages the analysis provided through the management
4 reporting and analysis function described below to identify issues that may impact
5 Toronto Hydro's ability to achieve its financial objectives. Financial planning allows the
6 utility to make effective decisions that enable the achievement of the company's strategic
7 goals and objectives and outcomes to the benefit of ratepayers while ensuring
8 governance and oversight of all financial planning activities. Without this function,
9 Toronto Hydro's business planning and budgeting processes would be decentralized,
10 which would introduce a variety of governance risks to the utility.

11

12 *5.1.2 Management Reporting and Analysis*

13 The management reporting function oversees internal management reporting and
14 supports operational groups through month-end activities and financial analysis for
15 decision making and achievement of strategic objectives. Responsibilities of this function
16 include: managing financial systems and processes to effectively deliver timely reports
17 and outlooks; reviewing, consolidating and preparing analyses for management reports
18 to enable timely decision making; providing support for external reporting and disclosure;
19 performing core month-end accounting functions such as month-end close entries,
20 account reconciliation, and analysis to ensure compliance with OSC, OEB and audit
21 requirements; and reviewing and consolidating monthly financial outlooks. By providing
22 regular reports and analysis of the utility's operational expenditures, this function enables
23 Toronto Hydro to track and monitor its performance relating to execution of the
24 operational work plan. In addition, the team collaborates with operational groups to
25 develop, implement and optimize internal controls and processes to maintain the
26 integrity of financial data and improve efficiency. These services are essential to Toronto

1 Hydro’s ability to comply with regulatory and statutory accounting standards, to produce
2 accurate financial statements, and to successfully deliver the utility’s operating work
3 plans.

4

5 *5.1.3 Capital Planning and Reporting*

6 The capital planning function oversees the development of the utility’s annual capital
7 expenditure budget and long-term capital expenditure projections. The Capital Reporting
8 function records capital projects in the fixed asset register, and maintains tangible,
9 intangible, regulatory and statutory assets, and financial data under both Modified IFRS
10 and IFRS. The team provides fixed assets, capital expenditure (“Capex”), depreciation
11 expense, construction work in process (“CWIP”) and ISA continuities, reconciliations,
12 reports and analysis to ensure compliance with OSC, OEB and audit requirements. By
13 providing regular reports and analysis of the capital work plan, this function enables
14 Toronto Hydro to track and monitor its performance relating to execution of the plan. In
15 addition, the team collaborates with operational groups to develop, implement and
16 optimize internal controls and processes to maintain the integrity of financial data and
17 improve efficiency. These services are essential to Toronto Hydro’s ability to comply with
18 regulatory standards, to produce accurate financial statements, and to successfully
19 deliver the utility’s capital work plans.

20

21 *5.1.4 Payroll and Disbursements*

22 The payroll function ensures that Toronto Hydro employees are compensated for their
23 services in a timely and accurate manner, consistent with relevant time-keeping and other
24 records. The function also ensures that all relevant legislative requirements and statutory
25 deductions are appropriately applied to employee payments and that payroll

1 withholdings amounts are remitted on a timely basis. In addition, the function maintains
 2 accurate OMERS pension fund records for participating employees.

3
 4 The disbursements function facilitates timely and accurate payment of valid vendor
 5 invoices. It also processes payments for eligible customer refunds initiated by Toronto
 6 Hydro’s Customer Care Program. In performing these tasks, the disbursements function
 7 utilizes financial software to validate and, if necessary, correct the amounts and timing of
 8 payment of supplier invoices. In addition, it reviews software generated payment files
 9 and approves the resulting bank transfer files or cheque runs.

10
 11 **5.2 Controllership Segment Costs**

12 Table 4, below, provides the Historical (2020-2022), Bridge (2023-2024), and Test Year
 13 (2025-2029) expenditures for the controllership segment.

14
 15 **Table 4: Controllership Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Controllership	6.5	6.9	6.9	7.7	8.8	9.4	10.1	10.5	11.0	11.4

16
 17 **5.3 Controllership Segment Year-over-Year Variance Analysis**

18 2020 – 2021 Variance Explanation

19 An increase of \$0.4 million was primarily due to:

- 20 • Sustained increase in headcount in 2021 to support the increased size and
 21 complexity of the 2020-2024 capital program approved in the last OEB decision
 22 and general compensation increases of existing employees. These increases were
 23 net of sustained cost savings of \$0.2 million annually from 2021 and beyond as a
 24 result of the payroll and disbursement process automation.

1 2021 – 2022 Variance Explanation

2 There was no sustained variance. General compensation increases in 2022 of existing
3 employees were offset by lower headcount in 2022. The 2022 headcount was lower than
4 expected due to unplanned employee turnover; these roles are expected to be filled in
5 2023. Additionally, through continued adoption of technology and automation of
6 business processes, costs reduction and avoidance of \$0.4 million was achieved annually
7 from 2022 and beyond.

8

9 2022 – 2025 Variance Explanation

10 A forecasted increase of \$2.5 million due to:

- 11
- 12 • Increase in payroll costs as a result of backfilling of open positions that were left
13 vacant in 2022, general compensation increases of existing employees, and
14 recruitment of additional resources to support the increased size and complexity
15 of the capital program and to support the 2025-2029 rate application.

15

16 2025 – 2029 Variance Explanation

17 Between 2025 and 2029, costs in this segment are expected to increase by \$2.0 million,
18 or an average of \$0.5 million per year. Without the requested funding, Toronto Hydro
19 faces the following risks:

- 20
- 21 • Reduced governance and oversight of financial planning activities that can limit
22 the organization's ability to execute its long-term and short-term strategic vision
23 and plans and deliver outcomes to the benefit of ratepayers;
 - 24 • Reduced governance of key performance measures such as operating expenses,
25 regulated capital investments, in-service assets, and net income;
 - 26 • Increased risk of de-centralization of financial planning activities resulting in lack
of integration of operational, financial, and regulatory plans;

- 1 • Compromised month-end and financial analyses for management reports to
2 enable timely decision making related to operational expenditures and capital
3 investment;
- 4 • Reduced management of fixed assets and oversight of capital program spending
5 and ISAs that can impact approved commitments in prior OEB decisions and
6 compromise the achievement of strategic and financial objectives;
- 7 • Increased risk of delays and compromised accuracy of payroll remittances to
8 employees for their services, remittances of payroll withholding amounts and
9 payments of valid vendor invoices, which could result in non-compliance with
10 employment standards and an increase in litigation involving employees and
11 vendors; and
- 12 • Compromise on the quality of record keeping of OMERS pension fund for
13 participating employees.

14

15 **6. FINANCIAL SERVICES SEGMENT**

16 **6.1 Segment Description**

17 The financial services segment encompasses the functions that enable Toronto Hydro to
18 meet its regular and long-term financial obligations to its external suppliers, service
19 providers, and debt holders, and the government. It also allows the utility to plan for,
20 secure, and provide timely payments for market-competitive debt instruments that it
21 needs to finance its capital work program.

22

23 The financial services segment provides Toronto Hydro with a means to objectively
24 evaluate its core functions in order to ensure compliance to internal and external policies
25 and facilitate transparency in all corporate activities. The scope of activities comprising

1 this segment includes the following functions: (i) Corporate Tax; (ii) Treasury; (iii)
2 Insurance; and (iv) Internal Audit.

3
4 *6.1.1 Corporate Tax*

5 The corporate tax function facilitates the utility's compliance with all relevant tax laws
6 and regulations. In addition, it ensures that taxes are appropriately recorded and
7 reflected in accounting records and external financial statements. This function is
8 responsible for preparing and submitting timely tax filings and applicable payments that
9 include corporate income taxes, the harmonized sales tax, and the non-resident
10 withholding tax. The group executes tax-related financial planning activities, performs
11 tax-related monitoring and reporting work, and supports both internal and external tax
12 compliance audit activities as required by applicable legislation and internal policies.
13 Corporate tax is also responsible for regulatory tax reporting and compliance, such as the
14 Payment in Lieu of Taxes ("PILs") calculations for the purposes of rate filings.³

15
16 *6.1.2 Treasury*

17 The treasury function oversees Toronto Hydro's cash management, debt management,
18 and investor relations activities. Cash management activities include: (i) borrowing to
19 provide the utility with adequate funds to meet its financial obligations, or investing any
20 excess funds on hand; (ii) managing and implementing risk controls, including segregation
21 of duties and independent verification and approval of borrowing activities; and (iii) daily
22 reporting and reconciliation of Toronto Hydro's cash position and general ledger and sub-
23 ledger accounts. Debt management activities include the issuance of both long-term and
24 short-term debt instruments to fund the capital programs and for general corporate
25 purposes. Investor relations activities include developing and managing relationships

³ Exhibit 6, Tab 2.

1 with bank lenders, bond investors, independent financial and credit analysts, and the
2 credit rating agencies in order to optimize the cost of funding. The activities performed
3 by this function help facilitate access to the debt capital markets from which Toronto
4 Hydro accesses funds to carry out its operations and fund its long-term capital program.

5

6 *6.1.3 Insurance*

7 The insurance function oversees the utility's comprehensive insurance requirements, the
8 purpose of which are to provide Toronto Hydro protection for asset exposure, corporate
9 liability and other activities which may expose the utility to a financial loss. Current
10 insurance policies administered by this group provide coverage for a variety of losses and
11 expenses, including comprehensive general liability, all risk property and boiler and
12 machinery insurance, liabilities of directors and officers, automobile liability, professional
13 liability, and crime and cyber security insurance.

14

15 *6.1.4 Internal Audit*

16 Internal audit provides independent and objective reporting to Toronto Hydro
17 Corporation's Audit Committee and management through operational, compliance, and
18 performance audits. Internal audit focuses on assessing the adequacy and effectiveness
19 of the utility's risk management, governance, and system of internal controls, and
20 provides consultation and advisory services on the design, implementation, and
21 maintenance of internal controls and reporting systems, governance activities, fraud
22 detection procedures, and other matters requested by senior management or the Audit
23 Committee.

1 **6.2 Financial Services Segment Costs**

2 Table 5, below, provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 3 (2025-2029) expenditures for the financial services segment:

4

5 **Table 5: Financial Services Segment Expenditures (\$ Millions)**

6

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Financial Services	6.7	7.7	8.4	9.3	9.7	10.5	11.4	12.2	13.3	14.4

7

8 The expected increase in costs are primarily due to higher premiums on the existing
 9 insurance programs for property, liability and cyber insurance policies. These programs
 10 are in place to cover all material risks to Toronto Hydro. Toronto Hydro’s rate base is
 11 expected to increase from \$5.2 billion in 2022 to \$7.6 billion in 2029 which has a direct
 12 impact on the future property and liability insurance premiums. The cyber insurance
 13 premium increase is being driven by global geopolitical tensions, privacy regulations,
 14 ransomware evolution and the capacity constraints of insurers. For the 2023 to 2024
 15 bridge years and 2025 to 2029 forecast years all policy and self-insured deductible limits
 16 are expected to be at 2023 levels.

17

18 **6.3 Financial Services Segment Year-over-Year Variance Analysis**

19 2020 – 2021 Variance Explanation

20 An increase of \$1.0 million was primarily due to:

- 21 • The utility having sustained increased property and cyber security insurance
 22 costs of \$0.8 million, and
- 23 • General compensation increases for existing employees of \$0.2 million.

1 2021 – 2022 Variance Explanation

2 An increase of \$0.7 million was primarily due to:

- 3 • The utility having sustained increased property, general and cyber security
- 4 insurance costs of \$0.5 million, and
- 5 • General compensation increases for existing employees of \$0.2 million.

6

7 2022 – 2025 Variance Explanation

8 A forecasted increase of \$2.1 million is primarily due to:

- 9 • An increase in costs for general and cyber security insurance of \$1.2 million
- 10 • General compensation increases for existing employees of \$0.7 million, and
- 11 • Increased support costs for tax audits of \$0.2 million.

12

13 2025 – 2029 Variance Explanation

14 Between 2025 and 2029, costs in this segment are expected to increase by \$3.9 million,
15 or an average of \$1.0 million per year. Without the requested funding, Toronto Hydro
16 faces the following risks:

- 17 • Compromised ability to secure funding to finance the capital programs and risk of
- 18 violation of the covenants contained in existing debt issuances;
- 19 • Increased difficulty maintaining compliance with relevant tax laws, rules,
- 20 regulations and appropriate tax reporting and disclosure requirements, which
- 21 could cause an increase in tax risks and related costs;
- 22 • Reduced ability to ensure operational compliance and performance due to lack of
- 23 design, implementation, and maintenance of internal controls and reporting
- 24 systems, governance activities, and fraud detection procedures; and
- 25 • Inability to effectively protect the utility against a variety of potential insurance
- 26 risks and losses outside of normal business operations.

1 **7. EXTERNAL REPORTING SEGMENT**

2 **7.1 Segment Description**

3 The external reporting segment oversees the preparation and compilation of external
4 financial reporting materials, such as those required by the OSC and the OEB. Among
5 other things, this function requires the preparation of publicly filed annual and interim
6 financial statements and disclosures and reporting to the Board Audit Committee. The
7 segment is also responsible for assessing, reviewing, documenting and communicating all
8 changes in accounting standards to relevant stakeholders, and assessing the accounting
9 treatment for new or complex transactions.

10

11 The specific activities and internal controls underlying Toronto Hydro's external reporting
12 processes are subject to regular reviews by independent internal and external auditors.

13

14 To enable timely and accurate execution of its core functions, the segment undertakes
15 two sets of primary activities. First, the segment performs central accounting functions
16 such as consolidation entries, intercompany settlements and eliminations, accounting for
17 post-employment benefits, and other account reconciliation and management activities.
18 Second, it uses information in the company's accounting systems to prepare all required
19 financial filings. These filings include the audited annual financial statements and notes
20 (consolidated and for each legal entity separately), the MD&A, the AIF and other reporting
21 requirements from time to time. With the exception of the AIF, the above documents are
22 filed quarterly.

23

24 In addition, the external reporting segment is responsible for the regulatory reporting and
25 revenue management function which oversees financial activities associated with the
26 OEB and is responsible for the accounting in relation to Toronto Hydro's transactions with

1 the IESO and other suppliers for cost of power expenses and other related regulatory
 2 settlements. Other responsibilities include budgeting, forecasting, financial analysis and
 3 related preparation of information for reporting under the RRR and for the purpose of
 4 rate applications. This function also supports OEB audits, enables compliance with the
 5 OEB-mandated financial and regulatory accounting requirements outlined in the APH,
 6 and supports the external reporting, management reporting, analysis, and financial
 7 planning in relation to regulatory assets and liabilities.

8

9 **7.2 External Reporting Segment Costs**

10 Toronto Hydro requires approximately \$4.9 million per year over the 2025-2029 plan
 11 period to execute the functions in the external reporting segment, as described above.

12

13 Table 6, below, provides the Historical (2020-22), Bridge (2023-2024), and Forecast (2025-
 14 2029) expenditures for the external reporting segment:

15

16 **Table 6: External Reporting Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
External Reporting	3.2	3.3	3.1	3.9	4.4	4.5	4.7	4.9	5.1	5.3

17

18 **7.3 External Reporting Segment Year-over-Year Variance Analysis**

19 2020 – 2021 Variance Explanation

20 An increase of \$0.1 million was due to:

- 21 • Inflationary impacts on non-payroll costs.

22

23 2021 – 2022 Variance Explanation

24 A decrease of \$0.2 million was due to:

- 1 • Lower payroll costs as a result of lower headcount in 2022. The 2022 headcount
2 was lower than expected due to unplanned employee turnover; these roles are
3 expected to be filled in 2023; and
4 • The lower payroll costs were partially offset by general compensation increases
5 of existing employees and inflationary impacts on non-payroll costs.

6

7 2022 – 2025 Variance Explanation

8 A forecasted increase of \$1.4 million is due to:

- 9 • Increases in payroll costs due to hiring of open positions that were left vacant in
10 2022,
11 • General compensation increases of existing employees,
12 • The recruitment of additional resources to support the rate application, partially
13 offset by staff reduction upon winding down of rate application support, and
14 • Inflationary increases on non-payroll costs.

15

16 2025 – 2029 Variance Explanation

17 Between 2025 and 2029, costs in this segment are expected to increase by \$0.8 million,
18 or an average of \$0.2 million per year. Without the requested funding, Toronto Hydro
19 faces the following risks:

- 20 • Increased risk of reporting errors and material misstatements for financial
21 disclosures;
22 • Compromised ability to accurately prepare and compile external financial
23 reporting materials, such as those required by the OSC;
24 • Compromised quality of financial activities associated with the OEB, accounting in
25 relation to Toronto Hydro's settlements and transactions with the IESO, and other
26 related regulatory settlements;

- 1 • Lack of appropriate governance to support the Board of Directors' responsibilities
- 2 with respect to financial and audit matters; and
- 3 • Lack of regulatory and revenue management leading to increased risk of material
- 4 misstatements and inability to comply with the OEB's financial and regulatory
- 5 accounting requirements.

1 **INFORMATION TECHNOLOGY**

2

3 **1. OVERVIEW**

4 **Table 1: Program Summary**

Information Technology Program									
Outcomes: Customer Focus, Operational Effectiveness - Reliability, Public Policy Responsiveness, Operational Effectiveness - Safety, and Financial Performance									
Segments:									
<ul style="list-style-type: none"> • Security & Enterprise Architecture • IT Operations • Project Execution • IT Governance 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
48.0	50.6	53.5	57.5	61.1	63.3	65.8	68.7	71.7	75.1

5

6 The Information Technology (“IT”) program (the “Program”) supports all aspects of
 7 Toronto Hydro’s business. The IT infrastructure, cybersecurity controls, business
 8 applications and services supported and delivered by this Program enable efficient
 9 operations of the utility and play a critical role in achieving Toronto Hydro’s objective to
 10 provide safe, secure and reliable electricity.

11

12 The Program deploys, operates and supports all information systems and controls,
 13 including:

- 14 • **IT Hardware Support:** includes the core back-end infrastructure assets (e.g.
 15 servers, storage, backup, networks and data centres), cybersecurity components
 16 and endpoint assets (e.g. desktop computers, laptops, printers, smart phones, and
 17 tablets) that support Toronto Hydro’s day-to-day operations and core systems;

- 1 • **IT Software Support:** includes software applications such as cybersecurity,
2 databases, middleware and business-facing applications; and
- 3 • **Communication Support:** includes assets that enable the monitoring and control
4 of distribution communication infrastructure, including fibre-optic assets and
5 wireless Supervisory Control and Data Acquisition (“SCADA”) infrastructure, as
6 well as communication cost provided by third-party vendors.

7

8 Toronto Hydro performs this work under clearly defined IT architectural standards and
9 governance frameworks, defined in the IT Investment Strategy (“the Strategy”).¹

10 The Program consists of the following four segments:

- 11 • **Security and Enterprise Architecture:** Defines and implements a utility-wide IT
12 strategy, develops and oversees corporate IT policies and standards, assesses and
13 evaluates the suitability of new technologies to support the growth and
14 modernization of IT business processes and systems. This segment also performs
15 security operations, and manages enterprise IT risks including cybersecurity,
16 restore & recover, and disaster recovery.
- 17 • **IT Operations:** Supports and maintains the day-to-day operation of Toronto
18 Hydro’s IT assets, including core back-end infrastructure (e.g. servers, local area
19 networks and data storage/centres), security appliances and endpoint assets (e.g.
20 desktop computers, laptops, printers, smart phones, and tablets and end-user
21 applications).
- 22 • **Project Execution:** This segment is responsible for the implementation of new IT
23 solutions (programs, projects, and applications), that are required to achieve
24 Toronto Hydro’s strategic objectives in accordance with the IT expenditure plan.
25 This segment also includes the implementation costs for cloud solutions.

¹ Exhibit 2B, Section D8.

- 1 • **IT Governance:** Provides support to the IT investment planning process by
2 ensuring documentation and justification are developed to align with the Strategy.
3 This includes developing program and project level artifacts, and establishing
4 program goals and benefits. This segment provides financial and data governance
5 in accordance with the Strategy and the Enterprise Technology Portfolio (“ETP”)
6 Framework.¹ This segment also oversees IT administrative and procurement
7 activities and processes, as well as records management, reporting on IT Key
8 Performance Indicators (“KPIs”) and program planning.

9
10 The Program and its constituent segments are a continuation of the activities described
11 in the Information Technology program (OM&A) in Toronto Hydro’s 2020-2024 Rate
12 Application.²

13
14 **2. OUTCOMES AND MEASURES**

15 **Table 2: Information Technology Program Outcomes and Measures Summary**

Customer Focus	<ul style="list-style-type: none">• Contributes to Toronto Hydro’s customer focus objectives by:<ul style="list-style-type: none">○ Ensuring that IT assets which support Toronto Hydro’s customer-service and communication tools and systems (e.g. email and telephony systems and the Customer Information System) are available and in reliable working condition.○ Maintaining the integrity and availability of key external customer facing applications such as the Customer Self-Serve Web Portal, Toronto Hydro website and the interactive Outage Map (i.e. a map of Toronto Hydro’s service area displaying outage zones and estimated restoration times).
-----------------------	---

² EB-2018-0165, Exhibit 4A, Tab 2, Schedule 1.

<p>Operational Effectiveness - Reliability</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s system reliability objectives (e.g. SAIDI, SAIFI, FESI-7) by: <ul style="list-style-type: none"> ○ Supporting and maintaining the availability of modern, reliable and secure enterprise-wide IT/OT systems that monitor and control the performance of distribution. assets (e.g. SCADA), and by providing system operators timely and accurate information about these assets. ○ Supporting the outage restoration efforts by ensuring that system operators have the necessary IT/OT System tools to promptly identify incidents, develop effective resolution plans and communicate them to operational teams. ○ Supporting the creation and maintenance of cybersecurity controls to mitigate against potential vulnerabilities and threats that may jeopardize the safe and proper functioning of IT/OT assets. ○ Investing in innovative solutions including cloud solutions to ensure alignment of IT/OT systems with industry best practices and trends and support the growth and modernization of business operations.
<p>Public Policy Responsiveness</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s public policy responsiveness objectives by: <ul style="list-style-type: none"> ○ Enabling the efficient implementation of new policy initiatives and compliance with regulatory requirements. ○ Providing the technological infrastructure required by the utility to continuously improve and adapt its IT business processes to changing customers’ needs and preferences as a result of future industry challenges such as electrification.

<p>Operational Effectiveness - Safety</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s safety objectives, measured through metrics like the Total Recordable Injury Frequency ("TRIF") by: <ul style="list-style-type: none"> ○ Enabling more substation and field assets to be constantly monitored. ○ Ensuring underlying IT/OT Systems such as SCADA are functioning properly and are consistently available; and ○ Driving safety performance using: <ul style="list-style-type: none"> ▪ On-premises software systems such as SCADA, Network Management System (NMS) including Utility Work Protection Code (UWPC), and Radio Panic Button. ▪ Cloud Solutions systems such as: Automated Vehicle Location (AVL) for House of Services Regulation O.Reg.555/06, Electronic Tailboard (eTailboard), Intelx, Learning Management System (LMS).
<p>Financial Performance</p>	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s financial performance objectives by ensuring that core systems are operational with high reliability and availability supporting all areas of Toronto Hydro’s business, including operations, customer service, and regulatory, management, and internal and external financial reporting.

1
2
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11

3. PROGRAM DESCRIPTION

The Program provides reliable technology solutions to Toronto Hydro and its customers in a secure, timely, and cost-effective manner by implementing products that meet the utility’s evolving operational needs. Timely technical maintenance and support under this Program ensures the ongoing reliability, availability, security and operability of key business applications and underlying IT infrastructure. The Program also continues to ensure preventative and detective system controls are aligned with industry best practices including the Ontario Energy Board’s (“OEB”) Cybersecurity Framework.³ Ultimately, Toronto Hydro relies on the Program to satisfy its obligations to customers, maintain system reliability, availability and safety, and to comply with existing and

³ Ontario Energy Board, *Ontario Cybersecurity Framework* (December 6, 2017).

1 emerging requirements of the various regulatory bodies that govern the utility's
2 operations.

3

4 IT infrastructure, cybersecurity controls, and software applications must be periodically
5 refreshed and enhanced to maintain the reliability and availability of systems to support
6 core operations, mitigate against potential cybersecurity vulnerabilities and threats, and
7 minimize the risks of system failure. Accompanying this infrastructure, software
8 applications, and communications capital expenditures is the associated support in the
9 form of asset maintenance, licensing, and subscriptions, as well as the internal resources
10 required to support and maintain these assets. IT infrastructure, cybersecurity controls
11 and software applications must be kept current to mitigate the risks of cyber-attacks that
12 can disrupt day-to-day operations, compromise or exfiltrate sensitive data as well as to
13 prevent obsolescence and reduce interruptions to the distribution system.

14

15 The Program supports the automation of core processes and functions, such as customer
16 billing and outage management. It also enables the utility to evolve its existing business
17 processes to meet new business objectives and requirements in response to changes in
18 customers' needs and preferences due to industry changes. For example, the shift
19 towards electrification will require the need for additional energy data storage and
20 processing capabilities, and these IT systems will enable the connection of Distributed
21 Energy Resources ("DER") by streamlining the evaluation and technical assessment of the
22 connection. The IT systems will also provide the capability to remotely monitor and
23 control assets (e.g. DERs, switches, breakers, etc.).

24

25 All of these activities are provided through IT's program four segments: (i) Security and
26 Enterprise Architecture; (ii) IT Operations; (iii) Project Execution; and (iv) IT Governance.

1 **4. PROGRAM COSTS**

2 In 2025, Toronto Hydro requires \$63.3 million in rate funding for the Information
 3 Technology (IT) Program, which represents an increase of \$15.3 million over the last
 4 rebasing in 2020. When normalized for shared services recoveries outlined in Exhibit 4,
 5 Tab 5, Schedule 1, the expected increase in this Program is \$14.9 million.

6
 7 Over the 2025-2029 period, the utility expects the cost of this Program to increase by a
 8 compounded annual growth rate of 4.4 percent which is necessary to ensure the efficient
 9 execution of the functions in this Program.

10
 11 The Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-2029) expenditures
 12 for each segment are summarized in Table 3 below.

13
 14 **Table 3: Information Technology Program Expenditures by Segment (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Security & Enterprise Architecture	3.7	4.5	6.1	6.6	7.3	7.6	7.9	8.4	8.8	9.3
IT Operations	36.9	38.4	39.9	43.0	44.8	46.0	47.5	49.1	50.8	52.2
Project Execution	4.7	4.9	5.0	5.6	6.7	7.4	8.0	8.8	9.7	11.1
IT Governance	2.7	2.8	2.5	2.3	2.3	2.3	2.4	2.4	2.4	2.5
Total	48.0	50.6	53.5	57.5	61.1	63.3	65.8	68.7	71.7	75.1

15

16 **4.1 Cost Drivers**

17 Maintenance and subscription costs account for 47 percent of the increase from 2020 to
 18 2024 and 52 percent of the increase from 2025 to 2029. Software applications and
 19 hardware systems require ongoing maintenance and subscription contracts ranging from
 20 regular upgrades, to simple patches and updates, to targeted problem resolution (e.g.
 21 defect fixes). The maintenance and subscription fees associated with software and

1 hardware are required to ensure systems receive support from vendors, align with
2 industry best practices, remain integrated with other relevant software systems, and are
3 protected against future cybersecurity threats. These contracts allow Toronto Hydro to
4 maintain the integrity, reliability, availability, and security of its IT systems.

5
6 Factors driving the expected increase in maintenance and subscription costs include:

- 7 • Implementation of new applications such as Oracle Field Services Cloud (“OFSC”),
8 an upgrade to the mobile workforce management system for Grid Emergency
9 Management which replaced the legacy on-premises in-house developed
10 solution. OFSC is a tool that allows Dispatchers and Grid Response crews to
11 collaboratively manage outage events that include: assembling crews, managing
12 priorities, and communicating across different groups to respond to an unplanned
13 outage event in a timely and effective manner.
- 14 • Modernization to the external Customer Self-Serve (“CSS”) Web portal and mobile
15 application to provide additional channels and functionalities to customers.
16 Functionalities include proactive outage notifications, automated move-in and
17 move-out processes, and the ability to view consumption in real time.
- 18 • E-Tailboard application allows field staff to conduct electronic worksite risk
19 assessments. This solution provides an efficient, comprehensive and transparent
20 digital platform which highlights the safety aspects, precautions, and risk levels
21 while ensuring all safety procedures & protocols are in place at the job sites before
22 crews carry out their duties.
- 23 • Increases in cybersecurity maintenance and subscription fees as a result of new
24 continued investments into cloud based, AI-enabled prevention, detection, and
25 response solutions in addition to cybersecurity hardware and software to
26 adequately protect current systems, applications, and endpoints against the

1 evolving cybersecurity threat landscape and to fulfill regulatory compliance
2 obligations. This ensures that cybersecurity processes and controls are capable of
3 adequately responding to the evolving threat. Cybersecurity requirements need
4 to adapt to changes in the environment, such as hybrid work model, evolving
5 cybersecurity landscape, geo-politically driven Advanced Persistent Threats (ATP),
6 supply chain attacks and zero-day vulnerabilities. Toronto Hydro plans to meet
7 its security requirements arising from such scenarios by continuing to invest in its
8 robust infrastructure using layered Defence-in-Depth model to ensure the
9 protection of both IT and OT assets, in response to future industry challenges such
10 as electrification. Additional investments will be required to take a more proactive
11 approach to cybersecurity, including threat hunting, Extended Detection &
12 Response (XDR), attack surface management and Red/Purple Team simulations.
13 Additionally, a growing number of cybersecurity solutions are moving to
14 subscription licensing models, driving further increases in maintenance costs.

- 15 • Increases in subscription fees due to greater investments in cloud solutions, as
16 deemed appropriate in alignment with the Strategy. This shift to subscription from
17 the traditional perpetual licensing model is expected to grow as more IT vendors
18 move towards a subscription model for both cloud-based and on-premises
19 systems. Many vendors are adopting "cloud only" solutions that rely solely on
20 cloud technologies instead of providing an option to host a solution on-premises.
- 21 • On aggregate, all maintenance costs have been increasing as a result of
22 inflationary contract escalation increases and the relative depreciation of the
23 Canadian dollar against the U.S. dollar.

24

25 Other labour, including internal and external resources, account for 51 percent of cost
26 increases from 2020 to 2024 and 48 percent of the cost increases from 2025 to 2029.

1 Adequate resourcing for this program will be critical to supporting all of Toronto Hydro's
2 business units and enabling the execution of the business plan over the 2025-2029 rate
3 period. As examples, Toronto Hydro has observed the following workload trends driving
4 the program's resourcing needs:

- 5 • From 2020-2024 to 2025-2029, an increase of 18% in the number of complex
6 systems operated and maintained by the program;
- 7 • From 2020 to 2023, an increase of 22% in IT service requests handled by the
8 program;
- 9 • From 2020-2024 to 2025-2029, an increase of 9% in cyber security systems and
10 controls overseen by the program; and
- 11 • From 2020-2024 to 2025-2029, an increase of 6% in the number of endpoint
12 devices supported by the program.

13
14 The external labour includes consulting costs primarily related to cloud implementation,
15 temporary staff that were engaged in cloud project work or backfill for permanent staff,
16 and managed services for security services and for Toronto Hydro's Enterprise Resource
17 Planning ("ERP") system. Filling vacancies due to retirements and resignations and the
18 need for additional headcount are the contributing factors for internal and external
19 labour rate increases. Additional headcounts with specialized skillsets are also forecasted
20 to support the increased investments in IT systems both on-premises and cloud (such as
21 Asset Investment Planning ("AIP"), OFSC, CSS portal etc.), and the ongoing sustainment
22 and support of new and existing IT systems. The expected increase in headcount will
23 ensure Toronto Hydro has the appropriate level of resources to achieve the objectives of
24 the Program.

1 **4.2 Cost Control and Productivity Measures**

2 Toronto Hydro’s IT and Operational Technology Systems Program aims to modernize
3 business processes sustainably to support customer and business-facing services in
4 response to future industry shifts towards electrification.⁴ The IT team continuously
5 explores and implements opportunities to improve productivity by supporting the
6 modernization and automation of IT business processes, while meeting the program
7 objectives. Some examples of productivity improvements are outlined below.

8

9 For example, IT Service Management (“ITSM”) automated processes in the areas of
10 Service Request Management, Help Desk Support, and the Application Deployment
11 Management. High-volume service requests such as system and folder access,
12 onboarding, offboarding and unlocking user accounts are now fully automated. Reducing
13 time spent on repetitive calls frees helpdesk teams to focus on more complex issues.
14 Although IT Service requests increased by 79 percent between 2020 – 2022, all service
15 level targets were achieved without requiring additional headcount. In addition,
16 automation in the ITSM processes resulted in a cost savings of \$0.5 million over the two
17 years.

18

19 In managing software subscription and maintenance costs, Toronto Hydro developed an
20 IT maintenance and subscription dashboard to support its application rationalization
21 process. The dashboard allows teams to identify opportunities to keep, replace, retire, or
22 consolidate business applications. Toronto Hydro examines various factors prior to
23 renewing a maintenance and subscription contract to determine if there are any
24 efficiencies or cost-savings to be leveraged before renewal. This allows IT to consolidate
25 and rationalize applications, optimize license usage, resulting in anticipated operational

⁴ Exhibit 2B, Section 8.4.

1 savings of approximately \$1 million between 2022-2025. Toronto Hydro was able to
2 effectively negotiate multi-year contracts to mitigate inflationary risk and take advantage
3 of volume discounts, where appropriate.

4

5 The IT team evaluates global technology trends to identify improvement opportunities
6 for Toronto Hydro's IT hardware environment. This includes identifying more efficient
7 hardware options and life-cycle hardware for different environments, thus optimizing
8 investments and limiting costs. This strategy allows Toronto Hydro to align its IT system
9 investments with the industry best practices and be equipped to meet customers' needs
10 and preferences in the face of future industry challenges such as electrification.

11

12 The Project Execution team continues to refine and enhance the project management
13 framework by studying and implementing the lessons learned from prior projects and
14 adopting industry best practices and standards. This approach reduces the risk of cost
15 overrun and helps to avoid redundant IT investments that do not align with Toronto
16 Hydro's Information Technology Asset Management Strategy and Investment Planning
17 procedures or the organization's modernization strategic objective.⁵ This team delivers
18 value to the business quickly while maintaining the timely completion of high-quality
19 deliverables. In the period from 2020 to 2022, this team generated cost savings of \$0.8
20 million.

⁵ *Supra* note 5.

1 **5. SECURITY AND ENTERPRISE ARCHITECTURE SEGMENT**

2 **5.1 Segment Description**

3 The Security and Enterprise Architecture segment manages Toronto Hydro's
4 cybersecurity function, oversees the corporate Information Technology portfolio,
5 implements utility-wide IT strategy, and develops and oversees corporate IT policies.

6

7 This segment addresses cybersecurity at Toronto Hydro by implementing preventative
8 and detective controls aligned with industry best practices, including the OEB's
9 Cybersecurity Framework.⁶ IT is becoming increasingly important as a key business
10 enabler, which also carries the increased risk of cybersecurity exposure. The global
11 cybersecurity threat landscape is constantly evolving, with attacks ranging from social
12 engineering to destructive ransomware attacks to nation-state backed Advanced
13 Persistent Threats (APT). A recent Statistics Canada survey of more than 12,000
14 companies revealed that the number of cybersecurity incidents and the costs associated
15 to detect and prevent these incidents increased in 2021 from 2019.⁷ Recent ransomware
16 attacks include a 2020 attack on Colonial pipeline (a major fuel pipeline in United States
17 that carries gasoline, diesel and jet fuel from refiners),⁸ a 2021 attack on the Toronto
18 Transit Commission (TTC),⁹ a 2022 attack on Toronto's Hospital for Sick Children on
19 December 18, 2022,¹⁰ and a January 2023 cybersecurity incident at the Liquor Control
20 Board of Ontario highlight the ongoing need to prevent security breaches before they

⁶ *Supra* note 3.

⁷ Statistics Canada, *Impact of cybercrime on Canadian businesses, 2021*, (October 18, 2022) online: <
<https://www150.statcan.gc.ca/n1/daily-quotidien/221018/dq221018b-eng.htm>>.

⁸ Colonial Pipeline, *Media Statement Update: Colonia Pipeline System Disruption* (May 17, 2021);

⁹ Toronto Transit Commission, *TTC provides update on cyber security incident*, (November 8, 2021) online:
<[https://www.ttc.ca/news/2021/November/TTC-provides-update-on-cyber-security-](https://www.ttc.ca/news/2021/November/TTC-provides-update-on-cyber-security-incident#:~:text=Today%2C%20the%20TTC%20is%20providing,TTC%20promptly%20began%20an%20investigation.>)

[incident#:~:text=Today%2C%20the%20TTC%20is%20providing,TTC%20promptly%20began%20an%20investigation.>](https://www.ttc.ca/news/2021/November/TTC-provides-update-on-cyber-security-incident#:~:text=Today%2C%20the%20TTC%20is%20providing,TTC%20promptly%20began%20an%20investigation.>).

¹⁰ Sick Kids, *SickKids Lifts Code Grey with 80 percent of priority systems restored* (January 5, 2023) online:<
[https://www.sickkids.ca/en/news/archive/2023/sickkids-lifts-code-grey-with-80-per-cent-of-priority-systems-](https://www.sickkids.ca/en/news/archive/2023/sickkids-lifts-code-grey-with-80-per-cent-of-priority-systems-restored/#:~:text=Summary%3A,a%20ransomware%20attack%20on%20Dec.>)
[restored/#:~:text=Summary%3A,a%20ransomware%20attack%20on%20Dec.>](https://www.sickkids.ca/en/news/archive/2023/sickkids-lifts-code-grey-with-80-per-cent-of-priority-systems-restored/#:~:text=Summary%3A,a%20ransomware%20attack%20on%20Dec.>).

1 happen in order to protect the privacy of Toronto Hydro’s customers and employees and
2 maintain the integrity of the grid.¹¹

3

4 The OEB’s Cybersecurity Framework acknowledges the criticality of these emerging
5 threats to utility operations, and prescribes regulatory requirements to address the
6 associated risks.¹² The Security function’s efforts work towards ensuring the
7 confidentiality, integrity, and availability of the utility’s information assets, including the
8 protection of customer information. This segment also deals with an increasing volume
9 of threats to the energy sector including but not limited to sophisticated phishing,
10 impersonation and social engineering campaigns, ransomware that includes data
11 exfiltration functions, targeted industrial control systems attacks, and the malicious use
12 of Artificial Intelligence (“AI”) to automate malware creation and distribution. The
13 evolving cybersecurity threat landscape drives the need to continuously improve
14 cybersecurity posture and associated preventative and reactive controls.

15

16 The Enterprise Architecture function develops architecture practices and standards, and
17 identifies and manages key enterprise IT risks, such as cybersecurity, disaster
18 recoverability and IT restore & recover.

19

20 The IT Disaster Recovery (“DR”) program enables Toronto Hydro to maintain the delivery
21 of its technical services when operationally impacted by major events such as a data
22 center failure. These could be the result of weather-related incidents, widespread power
23 outages, large scale application/system failures, or cybersecurity events. An IT DR

¹¹ Liquor Control Board of Ontario, *LCBO Statement Regarding Cybersecurity Incident and Response*, (January 12, 2023) online: < <https://www.lcbo.com/content/lcbo/en/corporate-pages/about/media-centre/news/2023-01-12.html>>.

¹² *Supra* note 5.

1 program that is continuously maintained, validated and improved upon helps Toronto
2 Hydro mitigate technical, operational, and financial risks to ensure business continuity.

3
4 The IT Restore & Recover (“R&R”) program enables Toronto Hydro to safely practice the
5 recovery of its critical applications from backup, validating the recovery plans for each
6 application using both on-line and offline/offsite backups. This enables IT teams to
7 rehearse data recovery in a segregated environment without impacts to production
8 systems, confirming data recoverability in the event of a ransomware attack or a major
9 system failure. The R&R program focuses on different applications each year in order to
10 cover all critical applications. This program allows Toronto Hydro to mitigate technical,
11 operation and financial risks by ensuring adequate tools and processes are in place and
12 practiced ahead of the actual need.

13
14 The function fulfills several key responsibilities:

- 15 • Establishes and maintains corporate IT standards, policies, and enterprise
16 architecture principles and standards based on best practices;
- 17 • Establishes and maintains IT disaster recovery program/framework and ensure
18 readiness to respond to an event;
- 19 • Ensures Toronto Hydro’s readiness to recover and restore data from back up
20 environments;
- 21 • Evaluates new technologies through Proof of Concepts (“PoC”) to identify
22 opportunities to modernize existing IT processes and systems. This includes
23 trialing an IT solution for a period to learn and understand its capabilities, benefits,
24 and assess alignment with the organization’s technical landscape and business
25 needs. PoC also enables the Enterprise Architecture team to update the IT
26 standards, policies, and frameworks, accordingly;

- 1 • Manages compliance and ensures programs adheres to the above policies,
 2 architecture principles and standards;
- 3 • Manages the enterprise information security posture and risk profile; and
- 4 • Drives operational cost efficiencies and business process streamlining.

5

6 **5.2 Security and Enterprise Architecture Segment Costs**

7 Table 4, below, provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 8 Year (2025-2029) expenditures for the Security and Enterprise Architecture segment.

9

10 **Table 4: Security and Enterprise Architecture Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Security & Enterprise Architecture	3.7	4.5	6.1	6.6	7.3	7.6	7.9	8.4	8.8	9.3

11

12 Without this level of funding for this segment, Toronto Hydro could be exposed to a
 13 number of risks, including:

- 14 • Increased risk of a successful cyber attack that could disrupt grid operations,
 15 impact system safety, compromise the confidentiality and availability of customer,
 16 employee, and corporate data, and ultimately, undermine the integrity of the
 17 entire distribution system;
- 18 • Cybersecurity asset and control obsolescence resulting in cybersecurity posture
 19 and lack of vendor support, may lead to frequent system outages and increased
 20 vulnerability of critical systems to cyber security threats;
- 21 • Shortages in technical subject matter experts and Managed Services resources
 22 leading to the inability to adequately maintain and support the cybersecurity
 23 ecosystem, further eroding the cybersecurity defenses, leaving critical systems
 24 vulnerable to attacks;

- 1 • Undue pressure on infrastructure reliability and capacity as requirements may not
2 align with the long-term IT growth plan;
- 3 • Inability to evaluate new and emerging technologies (e.g. PoCs) to ensure
4 alignment with industry best practices and support organization’s modernization
5 objectives, in response to future industry challenges such as electrification;
- 6 • Reduced or lack of technical capacity to lead IT and business teams in accordance
7 with IT standards;
- 8 • Increased risk of greater service outages due to a lack of IT architecture and
9 governance oversight;
- 10 • Inefficient design or configuration of ongoing and planned IT capital programs due
11 to a lack of IT architecture and security oversight;
- 12 • Lack of corporate IT standards/policies and enterprise architecture principles
13 increases tech sprawl which will result in increased operational costs due to higher
14 licensing, maintenance and support costs;
- 15 • Inability to support the successful implementation of IT programs and projects in
16 accordance with corporate IT standards and policies; and
- 17 • Lower customer experience due to inadequate or lack of integration in IT system
18 as a result of using various technologies that are incompatible or obsolete or due
19 to greater service disruptions as a result of weaker cybersecurity posture.

20

21 **5.3 Security and Enterprise Architecture Segment Year-over-Year Variance Analysis**

22 2020-2021 Variance Explanation

23 Between 2020 and 2021 costs in this segment increased by \$0.8 million due to:

- 24 • An increase of \$0.6 million in maintenance and subscription costs consisting of:
 - 25 • \$0.1 million increase was due to inflationary pressures on existing contracts; and

- 1 • \$0.5 million for net new contracts and full year subscription costs (e.g. detection
2 and prevention of cybersecurity attacks);
- 3 • An increase of \$0.2 million in consulting services to keep up with the evolving
4 cybersecurity threat landscape.

5

6 *2021-2022 Variance Explanation*

7 Between 2021 and 2022, costs in this segment increased by \$1.6 million due to:

- 8 • An Increase of \$0.8 million due to consultant services to keep up with the evolving
9 cybersecurity threat landscape. The Security Information and Event Management
10 system was reviewed to determine if the service met its business needs without
11 having to incur large up-front investment associated with implementing the
12 system. In addition, the failover capabilities and disaster recovery preparedness
13 for Toronto Hydro's data centre network infrastructure between its two main data
14 centre locations was reviewed and updated. This work contributed to the zero-
15 downtime goal of critical IT infrastructure services;
- 16 • An increase of \$0.4 million for labour costs for filling of vacancies due to
17 resignations; and
- 18 • An increase of \$0.5 million in maintenance and subscription fees consisting of \$0.3
19 million for net new contracts (e.g. detection and prevention of cybersecurity
20 attacks) and \$0.2 million due to inflationary pressures on existing contracts.

21

22 *2022-2025 Variance Explanation*

23 Between 2022 to 2025, costs in this segment are expected to increase by \$1.5 million,
24 due to:

- 25 • Compensation increases;

- 1 • Net new additions to the cybersecurity software and hardware capital program to
2 respond to evolving cybersecurity threat landscape consisting of higher volumes
3 and greater complexity of cybersecurity attacks;
- 4 • An increase in consulting costs for a cybersecurity audit to be completed in
5 2024 and other consulting such as POCs; and
- 6 • An increase in maintenance and subscription costs due to inflationary pressures
7 on existing contract and net new contracts (e.g. detection and prevention of
8 cybersecurity attacks).

9
10 These increases were partially offset by decreases in temporary staff costs due to reduced
11 need for temporary staff to back fill for vacancies due to all full-time vacancies filled by
12 the end of 2022 and decrease in temporary staff required for security services as more
13 services are moving to the cloud.

14
15 2025-2029 Variance Explanation

16 Between 2025 to 2029, costs are expected to increase by \$1.7 million, or an average of
17 \$0.4 million per year, to support the new additions to the cybersecurity software and
18 hardware capital program to protect against increased volume and complexity of
19 emerging cybersecurity threats, as described above. If Toronto Hydro were forced to
20 deliver this segment with a reduced level of funding over the 2025-2029 rate period, the
21 utility could face legal compliance risks and drawbacks including:

- 22 • Failure to maintain compliance with all applicable laws;
- 23 • An inability to effectively administer controls for the protection of customer
24 privacy;
- 25 • An inability to effectively administer legal and transactional controls for the
26 protection of utility information data in the cybersecurity landscape;

- 1 • Increased exposure to cybersecurity risk which could compromise customers’
2 and employees’ personal information and operational data and jeopardize the
3 safe and proper functioning of IT/OT assets;
4 • Inability to ensure IT systems can meet changing customers’ expectations in
5 response to future industry changes such as electrification and alignment with
6 the Strategy.

7

8 **6. IT OPERATIONS SEGMENT**

9 **6.1 Segment Description**

10 The IT Operations segment is responsible for day-to-day operation and support of all IT
11 systems at Toronto Hydro and also includes ITSM, IT Deskside and Helpdesk support. This
12 includes maintaining the integrity and availability of all corporate data, ensuring adequate
13 end user devices and backend infrastructure are available to support real-time data
14 processing of applications and databases, proactive capacity and performance planning,
15 routine systems maintenance, and continuous monitoring of all critical business systems
16 including radio and telephony.

17

18 The IT Operations segment consists of three core functions: (i) Hardware; (ii) Software;
19 and (iii) ITSM.

20

21 The Hardware function is responsible for the deployment and management of the
22 following asset components and services:

- 23 • Data and voice networks, fibre optic and radio infrastructure, telephony and
24 communication infrastructure;
25 • Advanced Metering Infrastructure and grid management networks;
26 • Servers, virtualization and operating system infrastructure;

- 1 • Data storage and backup environments; and
2 • Physical data centre infrastructure (cabling and racking).

3

4 The Software support function is responsible for the introduction and continuous
5 operation of the following asset components and services:

- 6 • Customer-facing software assets;
7 • Integrations between IT systems and applications;
8 • Database and middleware software assets such as Messaging Systems, Integration
9 Platforms, Application Servers, Web Servers, Oracle and Microsoft SQL Databases;
10 • End user devices, including desktops, laptops, phones, printers, as well as services
11 such as the deployment of operating system and software applications; and
12 • End user application development and reporting software assets and services.

13

14 The ITSM function is responsible for maintaining the reliability, availability and security of
15 all hardware, software and communication assets. To facilitate the continued operation
16 of these and other systems, Toronto Hydro follows the Information Technology
17 Infrastructure Library (ITIL) framework for effectively managing IT services throughout the
18 entire service lifecycle. This includes a 24/7 IT Helpdesk response structure that is vital to
19 ensuring timely resolution of incidents and problems to quickly respond to major system
20 outages. The Toronto Hydro ITSM has a three-level support path to effectively manage
21 and resolve issues and incidents. The path uses hierarchical structure to triage, i.e. assign
22 issues to the relevant technical specialists, thus facilitating effective troubleshooting and
23 resolution. This segment is responsible for incident, problem and change management
24 functions to ensure business continuity by restoring critical operations in a timely and
25 efficient manner during unplanned outages or a change (modification, addition or

1 removal) of an IT service or system. The problem management process investigates the
 2 root causes of an incident and develops a corrective action plan to prevent its recurrence.

3
 4 The IT Operations segment includes maintenance and subscription contracts, which
 5 provide vendor support for technology, performance and security fixes (e.g. patches), and
 6 new features and functionality. The IT operations segment also installs patches to the
 7 utility’s technology assets, when they are released by vendors, thereby mitigating
 8 cybersecurity and system performance risks. Prior to installing a patch, this segment is
 9 responsible for conducting extensive testing to ensure the patch does not impede existing
 10 functionality, and does not introduce reliability risk across different testing environments.

11
 12 **6.2 IT Operations Segment Costs**

13 Table 5, below, provides the Historical (2020-2022), Bridge (2023-2024), and Test Year
 14 (2025) expenditures for the IT Operations Segment.

15
 16 **Table 5: IT Operations Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
IT Operations	36.9	38.4	39.9	43.0	44.8	46.0	47.5	49.1	50.8	52.2

17
 18 Without this level of funding for this segment, Toronto Hydro could be exposed to a
 19 number of risks, including:

- 20 • Increase in frequency and duration of IT service outages and reduced availability
 21 of critical IT systems;
- 22 • Inability to adequately maintain and support critical systems, processes and
 23 functions such as security systems, metering, stations and SCADA

1 communications, radio, telephony and business and customer applications
2 services;

- 3 • Inability to install patches for utility's technology assets, resulting in inadequate
4 protection of critical business operations against expected increases in security
5 threats as a result of industry shift towards electrification;
- 6 • Inefficient or delayed execution of ongoing and planned IT capital programs and
7 risk of applications running out of vendor support, including initiatives related to
8 safety, reliability, regulatory compliance and customer service;
- 9 • Increase in resolution time of incidents and problems to prevent outages to critical
10 systems; and
- 11 • Inability to support end-users with day-to-day technical issues and remotely
12 deploy applications and install patch updates to hundreds of devices.

13
14 **6.3 IT Operations Segment Year-over-Year Variance Analysis**

15 2020-2021 Variance Explanation

16 Between 2020 and 2021, costs in this segment increased by \$1.5 million due to the
17 following:

- 18 • An increase of \$1.7 million in maintenance contracts and subscription fees
19 consisting of \$0.5 million due to inflationary pressures of existing contracts and
20 \$1.2 million for net new contracts,
- 21 • Increases of \$0.9 million in consultant services such as vendor support during
22 warranty periods of deployed software solutions and PoC;
- 23 • A decrease of \$0.9 million for retirements at the end of 2020 which were not filled
24 until 2021; and

- 1 • A decrease of \$0.2 million in labour costs due to the implementation of
2 productivity improvements through the automation of IT Service Management
3 ("ITSM") processes.

4

5 2021-2022 Variance Explanation

6 Between 2021 and 2022, costs in this segment increased by \$1.5 million due to the
7 following:

- 8 • Increases of \$1.0 million due to inflationary pressures on maintenance and
9 subscription costs; a \$0.6 million increase for existing contracts and the remaining
10 \$0.4 million for net new contracts;
- 11 • Increases of \$0.4 million in payroll costs due to compensation increases and the
12 transferred headcount from the Governance segment to the Service Management
13 segment;
- 14 • An increase of \$0.2 million in payroll costs due to compensation increases;
- 15 • An increase of \$0.2 million due to inflationary pressures on telecom costs; and
- 16 • A decrease of \$0.3 million in labour costs due to implementation of productivity
17 improvements through the automation of IT processes.

18

19 2022-2025 Variance Explanation

20 Between 2022 and 2025, costs in this segment are expected to increase by \$6.1 million,
21 due to:

- 22 • Increases in maintenance and subscription costs for existing, some of which were
23 subject to US Dollar exchange rate fluctuations and inflationary pressures and net
24 new contracts. This increase was mitigated by implementing application
25 consolidation and rationalization initiatives;

- 1 • Compensation increases and increases in labour costs to fill vacancies between
2 2022-2023 in order to support new systems (e.g. patching) and ensure availability
3 of these systems;
- 4 • Increases in consultant services for post project go-live vendor support for the CIS
5 Project;
- 6 • Increases in employee related expenses incurred to support a hybrid work
7 environment such as computer peripherals; and
- 8 • Increases in telecom costs due to inflationary pressures.

9
10 2025-2029 Variance Explanation

11 Between 2025 and 2029, costs in this segment are expected to increase by \$6.2 million,
12 or an average of \$1.6 million per year to support the continued growth of the capital
13 program, including increases in maintenance and subscription costs for existing and net
14 new contracts and increases in consulting costs, as described above. If Toronto Hydro
15 were forced to deliver this segment with a reduced level of funding over the 2025-2029
16 rate period, the utility could face various legal compliance risks and drawbacks, including:

- 17 • Limited ability to monitor and control assets if critical systems (e.g., SCADA,
18 NMS, Energy Centre) are not adequately maintained;
- 19 • Inability to remotely monitor and control assets that include DERs, switches,
20 breakers, etc. due to system unavailability;
- 21 • Risk of increased outage durations if critical systems (e.g. SCADA, NMS, OFSC,
22 tailboard, Radio Communication, Telephony, Metering, and Customer Care
23 applications) are not adequately maintained;
- 24 • An increase in field crew idle time as the critical safety systems are not available
25 for crews to carry out their duties such as responding to outages (e.g. SCADA,

1 NMS, OFSC, eTailboard, Radio Communication, Telephony, Metering, and
2 Customer Care applications);

- 3 • Unavailability of the Customer-Self-Serve Web Portal, Toronto Hydro website,
4 and Outage Map resulting in customers' inability to monitor their energy
5 consumption usage, view or receive outage notifications and restoration
6 timelines, leading to an increase in customer call volumes and lower satisfaction;
7 and
- 8 • Delay or failure to provide the required support and maintenance for IT capital
9 programs including initiatives related to safety, regulatory compliance, reliability
10 and customer service.¹³

11 12 **7. PROJECT EXECUTION SEGMENT**

13 **7.1 Segment Description**

14 The Project Execution segment is responsible for the execution of Toronto Hydro's IT
15 software programs both on-premises and in the cloud. This segment is also responsible
16 for the implementation of new IT cloud solutions (e.g. projects, programs and
17 applications).

18
19 Toronto Hydro's IT project execution practices are consistent with industry best practices
20 for project management frameworks. Toronto Hydro governs each project using a hybrid
21 project management framework that combines waterfall and agile methodologies. The
22 implementation approach for each project is based on the project complexity, use cases,
23 and timeline. For example, Toronto Hydro used Agile methodology to deliver Web-based
24 projects that require more frequent releases, whereas Waterfall methodology is best
25 suited for large, multi-year, Tier 1 system upgrade complex, high-risk projects. Toronto

¹³ *Supra* note 4.

1 Hydro's hybrid project execution approach strives to modernize the organization's project
2 management and execution processes and supports the growth in investment plans. The
3 combination of these two different methodologies enables the Project Management
4 Office to become adaptive, flexible, innovative, and efficient in delivering different types
5 of projects. Toronto Hydro governs each project using the Modern Project Management
6 methods, and produces a mature scorecard which demonstrates the overall health of the
7 project.

8
9 In addition, the segment is responsible for continuous improvement of various project
10 processes and procedure and ensures projects are implemented on-time, on-budget and
11 meets project/program objectives. This segment monitors project performance through
12 short-interval control by ensuring the Project Status Reports (PSRs) are completed on a
13 monthly basis and associated project risks are identified and addressed through
14 Management Control & Reporting System ("MCRS") process on an ongoing basis.

15 Greater investment in cloud solutions was required in the 2020-2022 period and is
16 expected to grow in the 2024-2025 period and 2025-2029 period to keep up with industry
17 trends. Where deemed appropriate and feasible as per the Strategy, cloud solutions will
18 equip the utility with the tools needed to support the modernization of business
19 processes. As the industry trend moves towards offering more cloud-based solutions,
20 these costs are expected to grow. Costs to implement the cloud-based solutions include
21 project initiation, planning, execution (e.g. configuration, development, testing,
22 customization, etc.), monitoring & control and deployment. Existing accounting rules
23 under International Financial Reporting Standards ("IFRS") require these costs to be
24 expensed.

1 The successful execution of ongoing and planned IT software programs allows IT to
 2 support the organization’s modernization strategic objective.

3

4 **7.2 Project Execution Segment Costs**

5 Table 6, below, provides the Historical (2020-2022), Bridge (2023-2024) and Forecast
 6 Years (2025-2029) expenditures for this segment.

7

8 **Table 6: Project Execution Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Project Execution	4.7	4.9	5.0	5.6	6.7	7.4	8.0	8.8	9.7	11.1

9

10 **7.3 Project Execution Segment Year-over-Year Variance Analysis**

11 The IT industry is currently trending towards more cloud offerings, and with this shift to
 12 the cloud, the forecast anticipates cloud implementations and subscriptions will be
 13 required to replace or enhance the current on-premises solutions.

14

15 2020-2021 Variance Explanation

16 Between 2020 and 2021, costs in this segment increased by \$0.2 million due to the
 17 following:

- 18 • An increase of \$0.8 million in external costs (e.g. consultant services) for the
 19 implementation of a full year of cloud-based solution such as Non-conformance
 20 Management System, Crew Management Systems and Electronic Tailboard
 21 solutions; and
- 22 • A decrease of \$0.6 million in labour costs due to the introduction of a modernized
 23 project management framework to streamline processes.

1 2021-2022 Variance Explanation

2 Between 2021 and 2022 costs in this segment increased by \$0.1 million due to the
3 following:

- 4 • Increases of \$0.5 million in external costs, including consulting costs and
5 additional headcount to implement cloud computing solutions with the
6 implementation of new cloud projects such as Customer Connection Portal, and
7 OFSC; and
- 8 • A decrease of \$0.4 million in labour costs due to redeployment of internal staff to
9 focus on capital work.

10

11 2022-2025 Variance Explanation

12 Between 2022 and 2025 costs in this segment increased by \$2.4 million, due to:

- 13 • An increase in external costs consisting of consulting services and additional
14 headcount to implement cloud-based solutions such as Customer Connection
15 Portal and OFSC;
- 16 • Compensation increases; and
- 17 • Headcount increases between 2023-2024 to support CIS cloud-based solutions.

18

19 2025-2029 Variance Explanation

20 Between 2025 and 2029 costs in this segment are expected to increase by \$3.7 million, or
21 an average of \$0.9 million per year, to support the implementation of cloud-based
22 solutions including increases in external costs, as discussed above. If Toronto Hydro were
23 forced to deliver this segment with a reduced level of funding over the 2025-2029 rate
24 period, the utility's capital investments could be at risk of falling behind industry best
25 practices which can result in financial risk to the organization, including:

- 1 • Limiting the utility’s flexibility to adopt cloud solutions, where necessary, in
2 alignment with industry best practices to continue to modernize and innovate;
- 3 • The inability to identify and execute IT projects that best support the utility’s
4 operations. Reductions in this area could place implementation of the planned IT
5 capital programs at risk, including initiatives related to safety, regulatory
6 compliance and customer service;
- 7 • The inability to execute IT projects to support the modernization of business
8 processes in response to industry shift towards electrification; and
- 9 • A reduced or limited ability to implement cloud solutions, which may be better
10 positioned to efficiently handle the growing technology requirements in storage
11 and computing and often required by investments technologies such as smart grid
12 and DER integrations.

13

14 **8. IT GOVERNANCE SEGMENT**

15 **8.1 Segment Description**

16 The IT Governance segment supports the IT investment planning process by ensuring
17 appropriate documentation (e.g. scope of work, change requests, purchase requisitions)
18 and justification are in place to support the IT programs. This includes developing program
19 and project-level artifacts and establishing program goals. This segment is further
20 responsible for providing budget control and oversight to track and report on IT program
21 expenditures and their alignment with the overall budget. This enables Toronto Hydro to
22 record IT expenditures correctly in accordance with OEB’s and IFRS reporting
23 requirements. The IT financial governance process includes conducting cost variance
24 analysis and determining program forecasts, as per the Enterprise Technology Portfolio
25 or in accordance with Toronto Hydro’s Information Technology Asset Management

1 Strategy and Investment Planning procedures.¹⁴ Administratively, it oversees the
 2 administration of external IT vendors maintenance and subscription contracts and third
 3 party contractors.

4
 5 This segment supports the enterprise-wide tracking and reporting requirements needed
 6 to comply with Toronto Hydro’s Records Management Policy and Record Management
 7 Framework, as well as applicable regulatory requirements, such as the OEB’s Electricity
 8 Reporting and Recordkeeping Requirements.¹⁵

9
 10 **8.2 IT Governance Segment Costs**

11 Table 7, below, provides the Historical (2020-2022), Bridge (2023-2024), and Forecast
 12 Years (2025-2029) expenditures for the IT Governance segment.

13
 14 **Table 7: IT Governance Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
IT Governance	2.7	2.8	2.5	2.3	2.3	2.3	2.4	2.4	2.4	2.5

15
 16 Without this level of funding for this segment, Toronto Hydro could be exposed to a
 17 number of risks, including:

- 18
- 19 • Financial risk due to lack of oversight on capital planning, operational budgets,
 20 contract and vendor management and compliance tracking of IT
 projects/programs;
 - 21 • Inability to continuously monitor changes in industry best practices and customer
 22 needs to prioritize new IT capital investments accordingly, leading to delayed

¹⁴ *Supra* note 5.

¹⁵ Ontario Energy Board, Electricity Reporting & Record Keeping Requirements (March 8, 2023).

1 execution of ongoing and planned IT capital programs including initiatives related
2 to safety, reliability, regulatory compliance, or customer service;

- 3 • Failure to meet regulatory and legal obligations with respect to records
4 management and data governance; and
- 5 • Failure to comply with privacy legislation and regulations governing the retention
6 of personal information.

7

8 **8.3 IT Governance Segment Year-over-Year Variance Analysis**

9 2020–2021 Variance Explanation

10 Between 2020 and 2021 the costs in this segment increased by \$0.1 million due to
11 compensation increases.

12

13 2021-2022 Variance Explanation

14 Between 2021 and 2022 the costs in this segment decreased by \$0.3 million due to labour
15 costs decreased as the function of Service Management is redeployed to Operations
16 Segment.

17

18 2022-2025 Variance Explanation

19 Between 2022 and 2025 the costs in this segment decreased by \$0.2 million, due to:

- 20 • Mitigating compensation increases by assigning staff to capital planning work and
21 streamlining governance activities to redeploy staff to other functions; and
- 22 • Decrease in consulting costs for a one-time a Disaster Recovery assessment
23 incurred in 2022.

1 2025-2029 Variance Explanation

2 Between 2025 and 2029 costs in this segment are expected to increase by \$0.2 million, or
3 an average of \$0.1 million per year, to maintain the resourcing capacity and capabilities
4 required to support the anticipated increases in volume and complexity of work for a
5 growing capital program. If Toronto Hydro were forced to deliver this segment with a
6 reduced level of funding over the 2025-2029 rate period, the utility could face various
7 legal compliance risks and drawbacks, including:

- 8 • Increased financial risk due to inadequate IT governance procedures and
9 oversight of capital planning, operational budgets, and contract and vendor
10 management and compliance tracking of IT projects/programs; and
- 11 • Reduced ability to meet the utility's regulatory and legal obligations,
12 including records management and data governance.

1 **PUBLIC, LEGAL AND REGULATORY AFFAIRS**

2

3 **1. OVERVIEW**

4 **Table 1: Public, Legal and Regulatory Affairs Program Summary**

Public, Legal & Regulatory Program									
Outcomes: Customer Focus, Public Policy Responsiveness, and Financial Performance									
Segments:									
<ul style="list-style-type: none"> • Legal Services • Regulatory Affairs • Communications and Public Affairs 									
Program Costs (\$ Millions)									
2020A	2021A	2022A	2023B	2024B	2025F	2026F	2027F	2028F	2029F
18.5	19.0	19.2	24.7	28.0	29.9	30.9	32.0	33.2	34.2

5

6 As the electricity distributor providing an essential service to the residents and businesses
 7 of City of Toronto, the utility is responsible for cultivating and maintaining open channels
 8 of communications with its diverse stakeholders, including customers, media, the general
 9 public, the Ontario Energy Board (“OEB”), the Independent Electricity System Operator
 10 (“IESO”), industry associations, municipal councillors and provincial and federal
 11 government officials. Through effective and timely communication and engagement,
 12 Toronto Hydro aims to build trust and maintain its strong brand and reputation. These
 13 duties are fulfilled by the highly-trained professional teams operating in this Program.

14

15 The Public, Legal and Regulatory Affairs program (“Program”) provides specialized legal,
 16 regulatory and public relations professional services to the utility and its affiliates. The
 17 Program addresses Toronto Hydro’s extensive legal, regulatory and communication
 18 needs; being one of the largest electricity distributors in the province of Ontario and
 19 serving Canada’s largest city. The objective of this Program is to sustain and improve

1 utility performance and compliance with external requirements through expert
2 management of the ongoing and evolving external demands and expectations of the legal,
3 regulatory, and public policy environment within which Toronto Hydro operates each day.

4

5 Under the umbrella of this Program, Toronto Hydro manages its corporate governance,
6 securities and disclosure, commercial law matters, construction, real property, litigation,
7 claims, privacy, regulatory reporting and compliance, energy policy and stakeholder
8 relations, rate application, regulatory law and compliance matters, load forecasting,
9 wholesale settlement, and rate-making processes. It also manages communication
10 channels with the public, outage notifications, strategic communications, ongoing
11 customer engagement, digital communications, media relations, issues management,
12 municipal stakeholder engagement, customer escalations and community relations.

13

14 Reflecting both the breadth and depth of the issues and matters that must be addressed
15 in the electricity sector, resources responsible for executing this Program have academic
16 backgrounds, experience and professional designations and skills in areas as such as law,
17 public policy, engineering, economics, communications, business management and
18 accounting. The resources conduct a large workload year-round, consisting of a variety
19 of high-volume processes and activities, such as preparing customer connection
20 agreements (including offers to connect and customer contribution agreements),
21 negotiating complex relocation agreements to facilitate large transit projects, drafting
22 and reviewing legal agreements with service providers and suppliers, processing legal
23 claims, performing IESO wholesale market settlements, assisting with escalated customer
24 inquires, filing annual and major rate applications, and complying with regulatory
25 obligations. Personnel in this program also provide strategic advisory services, such as
26 working with utility operations to support business and investment planning, manage

1 organizational risks and enable decision-making in accordance with legal and regulatory
 2 requirements and expectations.

3
 4 The Program costs include the fees remitted to the OEB, the amortized costs of major rate
 5 applications, as well as the cost of shared services to affiliates and supporting non-rate
 6 regulated business activities, which are recovered through allocations and recoveries
 7 detailed in Exhibit 4, Tab 2, Schedule 21 and Exhibit 4, Tab 5, Schedule 2.

8
 9 **2. OUTCOMES AND MEASURES**

10 **Table 2: Public, Legal and Regulatory Affairs Program Outcomes**

Public Policy Responsiveness	<ul style="list-style-type: none"> • Analyze and respond to OEB policy proceedings on behalf of Toronto Hydro, either individually or through an industry organization; • Facilitate Toronto Hydro’s participation in OEB policy working groups; • Respond in a timely manner to Electricity Reporting & Recordkeeping Requirements (“RRR”) and other required regulatory submissions in accordance with OEB requirements; • Advise on legal and regulatory compliance requirements, including service quality, consumer protection, and customer privacy requirements; and • Respond to freedom of information requests in accordance with the <i>Municipal Freedom of Information and Protection of Privacy Act</i>.¹
Operational Effectiveness - Reliability	<ul style="list-style-type: none"> • Drafting and reviewing various documents (e.g. procurement documents, purchase agreements, master contractual arrangements) that support the execution of Toronto Hydro’s capital programs; • Preparing various construction contracts, relocation agreements, and other bespoke contracts that protects the property, assets, design and construction of Toronto Hydro infrastructure. • Prepare and defend distribution rate applications to secure funding for Toronto Hydro’s capital and operations work programs.

¹ R.S.O. 1990, c. M.56, [“*Municipal Freedom of Information and Protection of Privacy Act*”].

Operational Effectiveness - Safety	<ul style="list-style-type: none"> • Contributes to Toronto Hydro’s public and employee safety objectives (as measured via metrics like Total Recordable Injury Frequency) by communicating timely information to customers and the public concerning capital work and outages (planned and unplanned).
Financial Performance	<ul style="list-style-type: none"> • Prepare distribution rate applications in accordance with OEB requirements; • Support business and investment planning processes in conjunction with major rate applications; • Minimize legal liability, recouping damages, and providing strong defenses against claims; and, • Ensure consistent and complete IESO wholesale market settlements
Customer Focus	<ul style="list-style-type: none"> • Support the execution of customer connections offer to connect processes; • Address easement inquiries and other real property matters; • Resolve claims and legal disputes; • Manage customer and stakeholder-facing issues governed by various legislation, regulations and codes.

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3. PROGRAM DESCRIPTION

The Public, Legal and Regulatory Affairs program consists of three segments:

- 1) Legal Services,
- 2) Regulatory Affairs, and
- 3) Communications and Public Affairs.

8 Legal Services provides timely, accessible, and specialized legal advice and support to all
 9 divisions within Toronto Hydro. In alignment with the utility’s corporate and operational
 10 strategy, Legal Services ensures Toronto Hydro is able to meet legal requirements and
 11 operate in an efficient and compliant manner. Legal Services provides dispute resolution
 12 services and general guidance and compliance advice with respect to legal interests,
 13 rights, and responsibilities of the utility, including, but not limited to, any requests or

1 compliance metrics relating to customer privacy. Legal Services facilitates the drafting,
2 negotiation, and execution of a variety of contractual instruments (including commercial
3 documents, construction documents, procurement documents, and customer offers to
4 connect) as well as real property transactions with necessary protections and legal due
5 diligence, and structures corporate governance processes to meet legal standards and
6 best practices.

7

8 Regulatory Affairs enables the utility to meet its obligations to the Government of
9 Ontario, OEB, IESO, and other regulatory and public policy stakeholders. The main
10 services provided by the segment include the development and execution of rate
11 applications and other matters before the OEB, regulatory legal and advisory services,
12 energy policy stakeholder relations, advocacy and implementation, regulatory
13 compliance monitoring, regulatory reporting, load forecasting, wholesale market
14 settlement, and rate design. Quarterly fees remitted to the OEB are included in this
15 segment. Costs pertaining to this rate rebasing application are also included, but
16 presented separately, with the full amount of these costs proposed to be recovered on
17 an amortized basis from 2025-2029.

18

19 Communications and Public Affairs maintains open channels of communications between
20 Toronto Hydro and its various stakeholders. The main services provided by this segment
21 include managing a number of different channels including owned media channels (such
22 as Toronto Hydro's website and social media) and conducting customer engagement
23 surveys. This segment also manages communication with the media and the public on a
24 variety of matters including planned and unplanned outages, engagement with municipal
25 stakeholders, customer escalations and community engagement and relationship
26 management concerning planned capital work.

1 **4. PROGRAM COSTS**

2 In 2025 Toronto Hydro requires \$29.9 million in rate funding for Public, Legal and
 3 Regulatory Affairs program, which represents an increase of \$11.4 million over the last
 4 rebasing in 2020. When normalized for shared services recoveries outlined in Exhibit 4,
 5 Tab 5, Schedule 1, the expected increase in this program is \$10.4 million.

6
 7 Over the 2025-2029 rate period, the utility expects the cost of this program to increase
 8 by annual growth rate of 3.4%. This increase is necessary in order to maintain the
 9 resourcing capacity to address the extensive legal, regulatory and public communication
 10 needs enabled by this program.

11
 12 Table 3 provides the Historical (2020-2022), Bridge (2023-2024), and Forecast (2025-
 13 2029) expenditures for each of the Program’s segments.

14
 15 **Table 3: Legal Services and Regulatory Affairs Program Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Legal Services	6.1	5.7	5.8	7.9	9.2	9.8	10.3	10.7	11.2	11.6
Regulatory Affairs	3.8	4.4	4.1	5.6	6.4	7.0	7.1	7.5	7.9	8.1
OEB Fees	3.4	3.2	3.6	4.0	4.4	4.5	4.6	4.6	4.7	4.8
Regulatory Applications (Custom IR)	1.6	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	2.0
Communications & Public Affairs	3.6	4.1	4.1	5.5	6.4	6.6	6.9	7.1	7.3	7.6
Total	18.5	19.0	19.2	24.7	28.0	29.9	30.9	32.0	33.2	34.2

16

17 **4.1 Cost Drivers**

18 There are a number of distinct and interrelated cost drivers in this Program.

1 *4.1.1 Volume and Complexity of the Capital Program*

2 Toronto continues to be one of the fastest growing cities in North America. As outlined in
3 Exhibit 2B, Section E5.1 (Customer and Generation Connections), serving this growing
4 city, Toronto Hydro receives a high volume of requests for connections and service
5 upgrades for residential and commercial development each year. From 2017 to 2022, the
6 City's development pipeline included 2,413 projects in various stages of approval and
7 completion,² setting a record of 717,327 residential units and 14,484,961 square metres
8 of non-residential gross floor area. This was the highest development volumes for any
9 five-year period the City has reported on to date. This rate of development drives a high
10 volume of work requiring legal and regulatory support, including offers to connect,
11 arrangements with developers, suite metering agreements, easements, operating
12 agreements, and third-party damage incidents.

13
14 In addition, the complexity of the utility's work program, particularly in areas of System
15 Access, System Service and Information Technology (IT) investments, is increasing as
16 Toronto Hydro makes investments to lay the foundation for the energy transition by
17 expanding and modernizing the grid to enable customer choice to connect new
18 technologies such as solar panels, heat pumps and electric vehicles.³ To support Toronto
19 Hydro and its customers in this electrification journey, the Program must keep up with
20 public, legal and regulatory advisory work that is increasing in both volume and
21 complexity. These needs are most cost-effectively addressed by internal resources with
22 the necessary skills and experience to provide the required services. Toronto Hydro must
23 have sufficient funding in this Program to attract and retain such talent in a competitive

² Including projects that are pending approval, approved, awaiting or holding building permits, or under construction - The 2413 pipeline projects breakdown is 622 built, 879 active and 912 under review. Toronto City Planning, Profile TO Development Pipeline 2022 Q2, (February 2023), online: <<https://www.toronto.ca/wp-content/uploads/2023/02/92b5-CityPlanning-Development-Pipeline-2022-Q2.pdf>>.

³ Exhibit 2B Section E5.1

1 labour market. That is a tall order particularly for legal and regulatory professionals with
2 transferrable skills who can often obtain higher paying jobs at other firms and
3 organizations. For example, over the 2020 to end of 2022, the Legal Services segment of
4 this Program experience a turnover rate of 156%.

5

6 *4.1.2 Supporting Major Infrastructure Projects*

7 As the city continues to grow, so does its need for expanded services and infrastructure
8 such as transit, public works, roads and highways. This need requires additional work to
9 be done by Toronto Hydro to rebuild and relocate infrastructure to support the expansion
10 and modernization of other services such as City water work, major transit expansion
11 projects by Metrolinx or the Toronto Transit Commission (“TTC”), developments, and
12 third-party communication upgrades.⁴

13

14 In addition, a number of large transit projects are currently planned or under
15 construction, including the Metrolinx Eglinton Crosstown, Metrolinx Finch West LRT,
16 Ontario Line Subway, Scarborough Subway Extension, and Yonge North Subway
17 extension. Third party-initiated projects require large scale relocation of Toronto Hydro’s
18 existing distribution assets and the energization of new assets. Timely and effective
19 planning and execution of these multi-year projects necessitates negotiation of complex
20 relocation agreements, the preparation of offers to connect and customer contribution
21 agreements, and thorough regulatory analysis to ensure alignment with the Distribution
22 System Code and applicable cost recovery rules. Expanded development also entails a
23 greater risk of third-party damage incidents, requiring appropriate construction and
24 litigation support. The need to maximize efficiency of transit development, as envisioned
25 by the *Building Transit Faster Act, 2020* (“BTFA”) which requires utilities to act swiftly to

⁴ Exhibit 2B, Section E5.2.

1 remove and relocate distribution infrastructure which in turn depends on having expert
2 legal advisors and consultants to support the negotiation of relocation and real property
3 related agreements.⁵

4 5 *4.1.3 Evolving Legal, Regulatory and Policy Requirements*

6 There is a major transformation taking place in the energy sector as municipal, provincial
7 and federal governments take steps to decarbonize key sectors of the economy. Various
8 government and OEB policy documents make it clear that local distribution companies
9 like Toronto Hydro play a crucial role in enabling this transformation. For example:

- 10 • The Ministry of Energy's *Powering Ontario's Growth* report recognizes that
11 Distributed Energy Resources ("DERs") are transforming the way residents and
12 businesses meet their energy needs and that much of this innovation is happening
13 at the distribution level.⁶ In addition to recent legislative changes, the government
14 is considering additional changes to encourage innovation;
- 15 • The Minister's 2022 *Letter of Direction* to the OEB notes the critical role of the
16 distribution sector as the pace of electrification increases and extreme weather
17 impacts communities – and the pressure on local distribution companies ("LDCs")
18 to continue providing high levels of reliability and resiliency to their customers
19 while also being responsive to changing customer expectations and new
20 government mandates;⁷ and,
- 21 • The OEB's 2023-2026 Business Plan emphasizes the scale and magnitude of the
22 energy sector transformation, the necessary reforms to energy regulation to

⁵ SO 2020, c 12. [*Building Transit Faster Act*].

⁶ Ministry of Energy, *Powering Ontario's Growth: Ontario's Plan for a Clean Energy Future* (July 10, 2023), online: <https://www.ontario.ca/page/powering-ontarios-growth>.

⁷ Ministry of Energy, *Letter of Direction from the Minister of Energy to the Chair* (October 21, 2022), online: <https://www.oeb.ca/about-oeb/corporate-governance-and-reports/letters-direction-formerly-mandate-letters>.

1 enable electrification as well as the necessary collaboration from industry
2 stakeholders.⁸

3
4 Changes in the energy sector driven by public policy, technological advancement and
5 customer-driven evolutions require both expanded levels and novel types of support
6 services from the Public, Legal and Regulatory Affairs program. Toronto Hydro must adapt
7 its legal and regulatory posture in an agile manner to meet the expectations of customer
8 and stakeholders and give effect to policy objectives while keeping the risk to the utility,
9 its ratepayers, and the public to a minimum. This places higher demands on the full range
10 of functions executed within this Program, including energy policy advocacy and
11 implementation, commercial law advice and transaction support, legal and regulatory
12 advice, reporting and compliance. For example, in 2018 Toronto Hydro made 17 policy
13 submissions to the OEB, MOE, IESO and NRCan, rising to 29 submissions in 2022. In
14 addition, Toronto Hydro participated in 85 external engagements in 2022.⁹ Toronto Hydro
15 also implemented 15 new or modified regulatory requirements. This volume of work is
16 expected to continue and further increase as the pace of the energy transition intensifies.

17

18 **4.2 Cost Control and Productivity Measures**

19 *4.2.1 Cost Management*

20 Toronto Hydro's past and ongoing efforts to minimize the cost of this Program and offset,
21 in part, the external factors driving increases in this program yield significant benefits for
22 customers. Cost management efforts in this Program focus on building a strong model of
23 internal resources with the necessary expertise, reducing reliance on external resources
24 (which are generally more expensive than internal resources on a per hour basis), or

⁸ Ontario Energy Board, *OEB Business Plan 2023- 2026*

⁹ These include working groups, committee meetings, webinar participation, direct meetings – and are inclusive of Coalition of Large Distributors and Ontario Energy Association submissions.

1 finding alternative, lower-cost means of accomplishing the work such as alternative-fee
2 arrangements and secondments from third party-service providers. Specific cost control
3 measures employed include:

- 4 • Reducing and freezing external law firm hourly rates through a request for
5 proposal (“RFP”) process. The RFP also resulted in additional benefits at no
6 incremental cost, such as access to legal research database and resources,
7 temporary staff lawyer backfilling and articling student secondments, which
8 further reduce the need to rely on external legal services;
- 9 • Negotiating alternative fee arrangement to cap costs on certain types of files;
- 10 • Negotiating additional contractual indemnities and insurance to reduce legal costs
11 and payable claims in order to protect the utility and its ratepayers;
- 12 • Working within industry consortiums and associations to collaborate on common
13 interest files, allowing Toronto Hydro to dedicate fewer resources to those files
14 while maintaining high quality engagements in energy policy development; and
- 15 • Proactively working with stakeholders on energy policy design and
16 implementation, reporting and compliance activities to build awareness of more
17 efficient and effective solutions and mitigate risks and future costs, including
18 those associated with potential non-compliance.

19
20 *4.2.2 Productivity*

21 Productivity enhancements enabled by this program include:

- 22 • Developing and delivering internal training and education sessions that improve
23 adherence to legal and regulatory requirements, thus reducing the costs of
24 substandard performance and non-compliance;

- 1 • Developing legal and regulatory knowledge management databases, including
2 document precedents, samples, clauses, research, and training materials, to
3 prevent duplication of effort and improve work efficiency;
- 4 • Attending continuing professional development sessions offered by external law
5 firms, educational institutions, consultant firms, and legal organizations, to
6 expand the scope of internal legal and regulatory expertise relating to issues that
7 can be addressed without engaging external resources;
- 8 • Development of teams with specialized legal expertise. The recent introduction of
9 new leadership positions in the Legal Services Segment has allowed for more
10 focused training of junior lawyers allowing for more efficient transfer of
11 knowledge;
- 12 • Standardizing processes to minimize the personnel time required to process third
13 party requests such as claims and freedom of information requests;
- 14 • In-housing legal work for customer connections, claims and major rate
15 applications and making process improvements to allow the utility to meet
16 necessary timelines and reduce overall external legal costs; and
- 17 • Subscribing to technology solutions for regulatory research services enhancing
18 internal regulatory acumen and expertise, and avoiding costs associated with staff
19 gathering and analyzing this information through manual efforts.

20

21 **5. LEGAL SERVICES SEGMENT**

22 **5.1 Segment Description**

23 The Legal Services segment covers a wide-range of activities including: day-to-day legal
24 advice to internal clients; the review, negotiation, and drafting of commercial
25 agreements; and completion of corporate, financial, and commercial transactions. This
26 segment also includes the corporate governance functions which supports corporate

1 filings and external reporting and disclosure activities, and the corporate secretariat
2 function, which supports governance matters, compliance with corporate statutes and
3 related rules and best practice guidelines. A key objective of these services is to ensure
4 the utility functions within the existing legislative and regulatory landscape and to work
5 with the other teams within the organization to ensure new policy and legal requirements
6 are properly implemented.

7

8 Legal advice on commercial matters includes execution of a variety of commercial
9 instruments, including the review and evaluation of procurement documents for the
10 purchase of goods and services by external vendors. Legal Services assists with review,
11 negotiation, and drafting of commercial contracts, including purchase agreements,
12 agreements for professional services, master contractual arrangements for long-term
13 vendors, and other bespoke agreements as may be required to give effect to the utility's
14 intentions in the applicable commercial transaction. Legal Services further supports the
15 administration of each commercial contract through any disputes with the applicable
16 vendors, as well as variance of those contracts to ensure the utility's interests are
17 protected, that the utility gleans the benefit intended from the contract, and that such
18 benefits are ultimately leveraged for the benefit of the utility's ratepayers.

19

20 Legal advice on construction matters includes reviewing, negotiating and drafting various
21 forms of construction contracts, relocation agreements, and other bespoke contracts that
22 facilitate third-party initiated projects (such as large-scale transit projects) while
23 protecting the property, assets, and design and construction of Toronto Hydro
24 infrastructure. The legal staff supporting construction ensure that Toronto Hydro's capital
25 projects, operations, and collaboration projects with third party entities run smoothly, at
26 an acceptable cost and without delay. In addition, the construction legal staff also ensure

1 that disputes regarding scheduling, defects, and/or other contractual terms are
2 appropriately and timely resolved to protect Toronto Hydro's interests in construction
3 projects. This work ensures that planned construction projects, or such other projects
4 where Toronto Hydro has an interest at stake, are completed in an efficient and timely
5 manner, and without protracted disputes impacting the projects and parties involved.

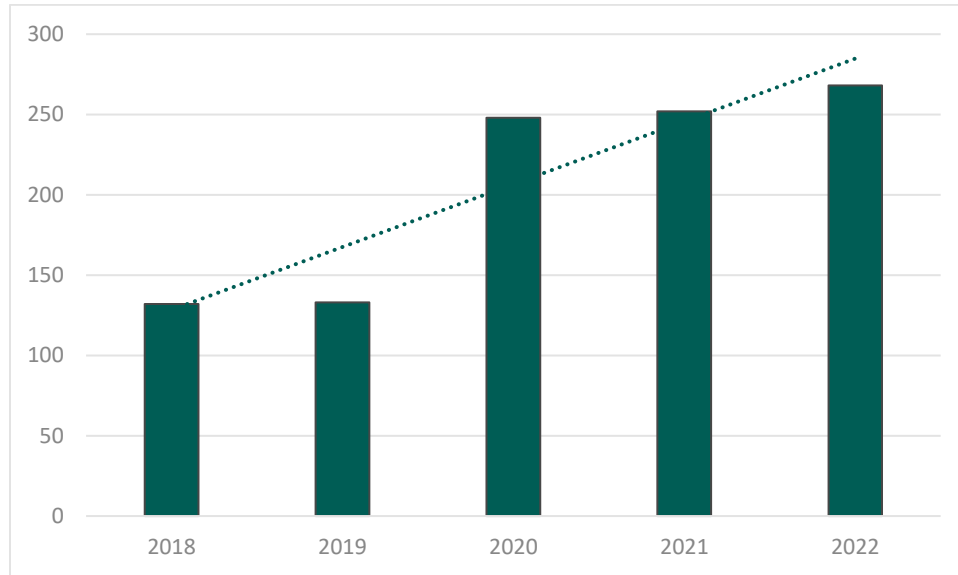
6

7 Legal advice on real estate matters includes reviewing, negotiating and drafting legal
8 documents relating to real property, such as customer connection agreements,
9 easements, as well as real property dispositions and acquisitions and leasing and licensing
10 arrangements. The legal staff supporting the real property function work closely with the
11 construction, asset management, stations and facilities operational units in their activities
12 to help ensure compliance with the requirements of the utility and its counterparties
13 related to property access, occupancy and equipment maintenance and repair. New
14 access and occupancy rights are obtained where necessary, in particular for new
15 infrastructure builds or connections. This allows capital projects and relocation projects
16 to move forward efficiently, and enables Toronto Hydro to avoid penalties and damages
17 relating to non-compliance with legislative restrictions or contractual obligations. For
18 instance, the BTFA grants Metrolinx the authority to prescribe specific timelines for the
19 completion of utility relocation work in relation to priority transit projects. Where a utility
20 is unable to comply with a prescribed timeline, Metrolinx is entitled to seek compensation
21 for losses or expense incurred because of the utility's non-compliance. The utility's risk
22 and liability exposure under the BTFA is unlimited.

23

24 As growth in the city drives increased volumes of capital work, there is a corresponding
25 increase in the volume of work on commercial, construction and real property matters.

1 Figure 1 below demonstrates that over the 2018-2022 period, Toronto Hydro has
2 experienced a steady increase in the number of contracts negotiated with suppliers.



3 **Figure 1: Contract Negotiated (initiated by Supply Chain)**

4

5 Similarly, Figure 2 shows that over the past five years the number of Offers to Connect
6 requiring expansion has increased driving both volume and complexity in this aspect of
7 the Legal Services segments.¹⁰

¹⁰ *Supra* note 3

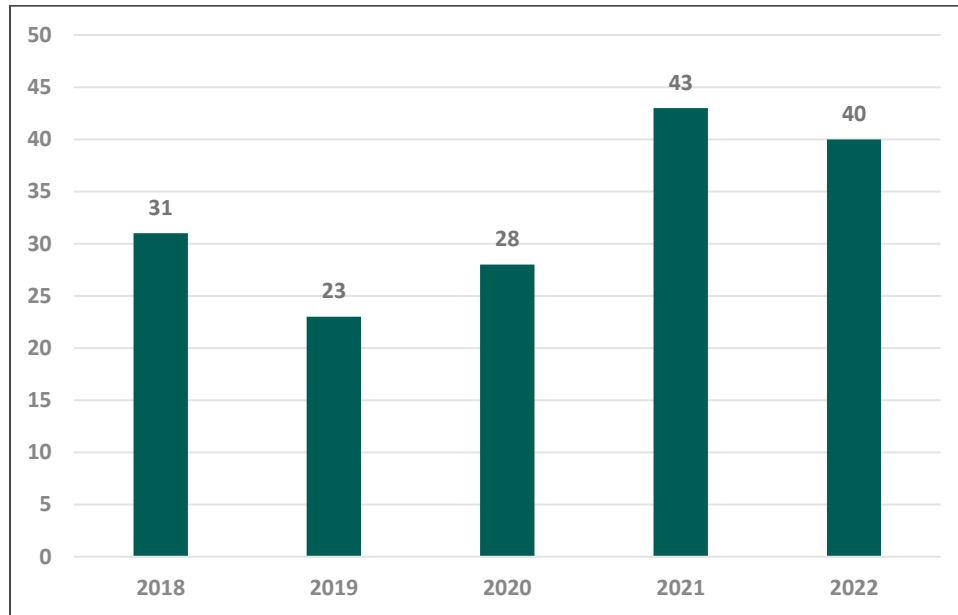


Figure 2: Offers to Connect Requiring Expansion

1

2

3 Toronto Hydro expects that the volume of commercial, construction and real property
4 work will continue to grow as Toronto Hydro's capital program increases by
5 approximately 42% over the 2025-2029 period.

6

7 In addition, Toronto Hydro's information technology groups are continuing to modernise
8 functions across the distribution entity as a whole, including the purchase and
9 implementation of a variety of cloud computing software and services to automate or
10 streamline existing functions. The complexity and volume of such commercial deals, often
11 comprised of multiple contracts for one purchase, will require an increase in commercial
12 efforts.

13

14 Claims professionals provide pre-litigation defense and response to claims made against
15 Toronto Hydro through the investigation of incidents, engagement with customers and
16 insurers, and supervision of external adjustment service providers. This part of the

1 segment's function manages and settles matters prior to them proceeding to litigation.
2 In addition to resolving claims brought against the utility, claims professionals also
3 support the recovery of invoiced claims when the utility's plant is damaged (e.g. poles hit
4 by cars). By pursuing demands and legal actions, Legal Services recovers damages
5 suffered by Toronto Hydro which otherwise would be unrecovered losses. Responding to
6 claims and inquiries by customers, while still advocating the legal rights of the utility, is
7 essential to positive customer service.

8

9 Litigation staff in Legal Services both respond to legal proceedings brought against
10 Toronto Hydro and advance legal proceedings to assert the utility's legal rights. This
11 involves the preparation and filing of statements of claim, statements of defence and
12 related documentation. It also involves undertaking or working with external counsel on
13 the defence and prosecution of personal injury and property damage matters and
14 commercial disputes as they proceed to formal litigation. For some matters covered by
15 the organization's insurance policies, Legal Services oversees external counsel approved
16 by Toronto Hydro's insurers.

17

18 Legal Services also manages issues relating to privacy compliance and protection of
19 personal information. This includes legal support in response to access to information
20 requests, customer privacy complaints, or internal privacy inquiries. Toronto Hydro takes
21 a pro-active approach to compliance with privacy best practices and emphasizes
22 providing optimal, proactive customer service. For example, the Legal Service team
23 routinely provides training workshops and proactive resources to its counterparts in
24 operations to ensure that privacy expectations are well understood and that privacy risks
25 are appropriately identified and managed.

1 **5.2 Legal Services Segment Costs**

2 Table 4 provides the Actual (2020-2022), Bridge (2023-2024), and Forecast (2025-2029)
 3 expenditures for the Legal Services segment.

4
 5 **Table 4: Legal Services Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Legal Services	6.1	5.7	5.8	7.9	9.2	9.8	10.3	10.7	11.2	11.6

6

7 **Legal Services Segment Year-over-Year Variance Analysis**

8 2020-2021 Variance Explanation

9 Between 2020 and 2021 costs in this segment decreased by \$0.4 million. This is
 10 attributed to lower than expected claim payouts.

11

12 2021-2022 Variance Explanation

13 Between 2021 and 2022 costs in this segment increased by \$0.1 million attributed to
 14 normal course compensation increases

15

16 2022-2025 Variance Explanation

17 Between 2022 and 2025, costs in this segment are expected to increase by \$4 million, or
 18 an average of \$1.3 million per year due to:

- 19 • inflationary cost pressures, including compensation increases consistent with
 20 the evidence outlined in Exhibit 4, Tab 4, Schedule 4; and
- 21 • incremental resourcing requirements to address: (i) increased volumes of
 22 customer connections activity to support growth and electrification in the City
 23 of Toronto, (ii) higher procurement activity to support the execution of the
 24 2025-2029 Distribution System Plan, including a ramp up in IT Software

1 investments (including cloud computing), and (iii) enhanced scope and
2 complexity in planning and coordination with third parties due to Priority
3 Transit, Building Broadband and City Development.
4

5 2025-2029 Variance Explanation

6 Between 2025 and 2029 costs in this segment are expected to increase by \$1.8 million,
7 or an average of \$0.5 million per year to maintain the resourcing capacity and
8 capabilities required to support the increased volume and complexity of work discussed
9 above. If Toronto Hydro were forced to deliver this segment with a reduced level of
10 funding over the 2025-2029 rate period, the utility could face various legal compliance
11 risks and drawbacks, including:

- 12 • Failure to maintain compliance with all applicable laws;
- 13 • Vendor non-compliance with Toronto Hydro policies and procedures,
14 undermining financial and operational controls;
- 15 • An inability to effectively administer controls for the protection of customer
16 privacy;
- 17 • An inability to effectively administer legal and transactional controls for the
18 protection of utility information data in the cybersecurity landscape;
- 19 • Ineffective or unfavourable negotiation of contract terms, resulting in
20 substandard performance by contracted parties or foregone recourse to
21 appropriate remedies, reducing the value to ratepayers;
- 22 • An inability to effectively recover amounts owing to the company from damages
23 caused by third parties, or defend against third party claims or litigation;
- 24 • Dissatisfied customers and other stakeholders, due to delays in completing
25 planned and externally-driven capital work (e.g. not achieving customer
26 connection timelines);

- 1 • Reduced risk-management which would lead to greater exposure to litigation
- 2 claims;
- 3 • Delays to externally-initiated relocation projects resulting in delays to
- 4 development and transit projects;
- 5 • Failure to obtain or protect adequate real property access rights for infrastructure,
- 6 leading to additional costs and project delays for planned and externally-driven
- 7 capital work; and
- 8 • An erosion in the utility's corporate governance performance and adherence to
- 9 securities law and principles, reducing the utility's access to capital markets and
- 10 raising the cost of capital.

11

12 **6. REGULATORY AFFAIRS SEGMENT**

13 **6.1 Segment Description**

14 Regulatory Affairs works with external stakeholders and internal subject matter experts
15 to support the advancement of public policy objectives and priorities outlined by the
16 Government, the OEB, and IESO in key documents such as the Minister's *Letter of*
17 *Direction* to OEB,¹¹ the OEB's Business Plan,¹² the IESO's *Pathways to Decarbonization*
18 *report*,¹³ and the Ministry of Energy's *Powering Ontario's Growth* report.¹⁴ All of these
19 documents underscore the central role that energy policy plays in supporting economic
20 growth, decarbonization and the ongoing transformation of Ontario's electricity system.

21

22 As Toronto Hydro prepares for electrification and the energy transition, there will be
23 increasing demands on the Regulatory Affairs team to ensure it can continue providing

¹¹ *Supra* note 7.

¹² *Supra* note 8.

¹³ Independent Electricity System Operator, *Pathways to Decarbonization Report* (December 15, 2022)
online:<<https://www.ieso.ca/en/Learn/The-Evolving-Grid/Pathways-to-Decarbonization>>.

¹⁴ *Supra* note 6.

1 thoughtful engagement with external and internal stakeholders. Externally, the objective
2 is to fully inform policy-makers with respect to the effects of prospective legislation,
3 regulations, codes, and other rules and guidelines. Thoughtful engagement also includes
4 providing the distribution company perspective to big policy questions brought on by the
5 energy transition. Toronto Hydro provides written submissions and formally participates
6 in working groups at the provincial level. Internally, the objective is to ready the utility
7 for potential energy policy changes and work with the affected parts of the utility to
8 ensure new requirements are well-understood and properly implemented. Continually
9 evolving regulatory requirements (e.g. Ultra-Low Overnight and Dynamic Class B Pilot
10 price plans, Green Button initiative, updated OEB codes) require significant effort across
11 the utility. Regulatory Affairs professionals coordinate these efforts, providing guidance
12 and advice to facilitate timely, efficient and sound implementation.

13

14 Regulatory Affairs and Government Relations staff work to build relationships with
15 stakeholders, like Metrolinx, to ensure that major projects (including priority transit
16 projects) can proceed without obstructions and that Toronto Hydro's relationships and
17 reputational interests are protected. As part of a mutually agreed upon issues
18 management and project update process, regular meetings are held with priority transit
19 partners to have a forum for open communication and issue resolution.

20

21 The Regulatory Affairs segments addresses the utility's financial requirements through
22 multi-year and annual rate-setting processes, as well as monthly wholesale settlement,
23 retail settlement and related transactions and reporting requirements to the government,
24 IESO, and OEB. The nature of these activities and associated governing rules continue to
25 evolve as a result of significant changes in government policy (e.g. feed-in-tariffs, net
26 metering, bill rebate/reduction programs). As these activities affect the accuracy of not

1 only Toronto Hydro's financials, but also the financials of the IESO and customers, Toronto
2 Hydro must be able to continue to attract and retain skilled and experienced staff who
3 can perform these highly-specialized rate-making and settlement tasks.

4

5 Regulatory Affairs prepares Toronto Hydro's applications to the OEB for rates and other
6 regulatory approvals. The most significant of these are rebasing applications, which have
7 most recently been large, complex custom applications. Over the span of a 5-year rate
8 cycle, regulatory professionals in this segment help the utility prepare and prosecute
9 thousand of pages of evidence and canvass hundreds of issues and claims raised by
10 parties who intervene in major rate applications. The cost of preparing and prosecuting
11 distribution rate rebasing applications is driven by the volume and complexity of the
12 application evidence, the utility's business plans, evolving business circumstances, and
13 responsiveness to regulatory and policy requirements and expectations.

14

15 The team responsible for major rate applications also plays a central role in the
16 implementation of the OEB Decisions and Rate Orders. This includes responding to
17 directives and undertakings, such as the Depreciation Study filed at Exhibit 2A, Tab 2,
18 Schedule 1, Appendix D and aligning utility planning with the parameters and guidance of
19 the OEB Decision. This end-to-end regulatory oversight approach for five-year custom
20 incentive rate periods is necessary in order to ensure that the utility has adequate time
21 to incorporate lessons from the OEB's prior rebasing decision, adapt to emerging
22 evolutions in the regulatory policy framework and evolving business circumstances, and
23 obtain and incorporate customer feedback in business planning.

24

25 In addition to the preparation, defence and implementation of rate applications,
26 Regulatory Affairs performs other rates-related functions, including: developing annual

1 forecasts of the utility's load and customers, processing annual distribution rate changes,
2 semi-annual commodity rate changes and other regulated rate updates (e.g. Rural or
3 Remote Electricity Rate Protection (RRRP), Wholesale Market Service Charge (WMSC),
4 and Retail Transmission Service Rates (RTSRs)), and updating and testing in Toronto
5 Hydro's billing system to ensure that the correct tariff rates are charged. Regulatory
6 professionals in this segment also gather and report information to the OEB through
7 annual RRR and other filings (e.g. winter disconnections, major outage events, cyber
8 security).

9
10 This segment also monitors other utility applications, conducts jurisdictional research,
11 prepares internal educational materials to advance regulatory acumen throughout the
12 organization, and advises internal stakeholders on a wide-range of regulatory law and
13 compliance matters including the implementation of new or modified regulatory
14 requirements such as Distribution System Code amendments. All of these proactive
15 activities enable Toronto Hydro to operate in accordance with its regulatory obligations,
16 bring forward thoughtful submissions and proposals to the OEB and other energy sector
17 stakeholders, and contribute to the advancement of public policy objectives.

18
19 *6.1.1 Distribution Rate Rebasing Applications*

20 As discussed above, Regulatory Affairs is responsible for preparing and prosecuting
21 Toronto Hydro's distribution rate applications, which include large and complex issues
22 that must be put forward in a very thorough way:

23 *Toronto Hydro is larger and has more complex issues than most if not all*
24 *distributors in Ontario, and the Application involves billions of dollars of*

1 *spending. The RRFE requires distributors to prepare and support their*
2 *applications, particularly Custom IRs, in a very thorough way.*¹⁵

3
4 In preparing this rebasing application, Toronto Hydro conducted extensive research and
5 background work to develop key elements of the performance-based rate framework
6 outlined in Exhibit 1B, Tab 3, Schedule 3. Carrying out this work Toronto Hydro was
7 mindful that this being among the first custom rate application to address imperatives of
8 the energy transition, the utility has an added responsibility to bring forward a thoughtful
9 and thorough proposal. Since 2021, the regulatory professionals in this segment worked
10 diligently to ensure that the record in this application is clear, cogent and responsive to
11 customers needs and stakeholder expectations as the utility takes active steps towards
12 preparing the grid and its operations for an unprecedented energy transition. Once the
13 application is filed, these staff will assist with the intensive requirements of prosecuting
14 the application and thereafter with the implementation of the Decision and Rate Order
15 and the execution of the 2025-2029 plan.

16
17 The costs of the major rate applications are included in this segment on an amortized
18 basis consistent with the Chapter 2 Filing Requirements and past OEB decisions. As with
19 the 2020-2024 Custom IR application, the costs of the 2025-2029 Custom IR filing are
20 expected to be approximately 0.2 percent of the total applied for revenue requirement
21 found at Exhibit 6, Tab 1.

22 OEB Exhibit 4, Tab 2, Section 18, Appendix 2-M provides a detailed breakdown of the
23 budget for this rate application.

¹⁵ EB-2014-0116 Decision and Order (December 29, 2015), pp. 12-13.

1 **6.1.2 OEB Fees**

2 OEB costs invoiced to Toronto Hydro are a condition of its distribution licence. Pursuant
 3 to the OEB Business Plan for 2023-2026,¹⁶ and the OEB’s Annual Reports for prior years,
 4 the OEB’s General Cost Recovery compound annual growth rate is forecast to be 7.07%
 5 percent between 2022 actuals and 2026 budget. For the same period, Toronto Hydro’s
 6 projected Fees to the OEB have a compound annual growth rate that is slightly lower at
 7 6.7%.

8
 9 Over the 2020-2024 period, Toronto Hydro projects that it will pay a total of \$18 million
 10 to the OEB or approximately \$3.6 million per year. Over the 2025-2029 period, Toronto
 11 Hydro projects it will pay a total of \$22.4 million or \$4.5 million per year. Toronto
 12 Hydro’s projected OEB Fees are approximately 8% of the OEB’s s. 26 Financial Plan,
 13 which is consistent with Toronto Hydro’s historical percentage share.

14
 15 **6.2 Regulatory Affairs Segment Costs**

16 Table 5 provides the Historical (2020-2022), Bridge (2023-2024), and Forecast Years
 17 (2025-2029) expenditures for this segment.

18
 19 **Table 5: Regulatory Affairs Segment and CIR Program Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Regulatory Affairs	3.8	4.4	4.1	5.6	6.4	7.0	7.1	7.5	7.9	8.1
OEB Fees	3.4	3.2	3.6	4.0	4.4	4.5	4.6	4.6	4.7	4.8
Regulatory Applications (Custom IR)	1.6	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	2.0

¹⁶ *Supra* note 8.

1 2020-2021 Variance Explanation

2 Between 2020 and 2021 the costs in this segment increased by \$0.4 million. A slight
3 increase in payroll was offset by a decrease in administrative costs and OEB fees.

4

5 2021-2022 Variance Explanation

6 Between 2021 and 2022 the costs in this segment decreased by \$0.1 million. An increase
7 in OEB fees and payroll costs was offset by a reduction in external services costs
8 reflecting the decision to in-source more regulatory work. The payroll increase was also
9 offset by labour recoveries for resources being allocated to support the blueprinting
10 phase of the Customer Information System project.¹⁷

11

12 2022-2025 Variance Explanation

13 Between 2022 and 2025 the costs in this segment are expected to increase by \$4.2
14 million, or an average of \$1.4 million per year. Of this increase, \$0.9 million is
15 attributable to OEB Fees, and \$0.4 million is related to the costs of this application
16 which are being amortized starting in 2025. The remaining \$2.9 million increase over
17 this three-year period represents an average of \$1 million per year, and is due to:

- 18
- 19 • incremental internal and resources to support: (i) higher volumes of work and
20 complexity related to the preparation, prosecution and implementation of the
21 2025-2029 rate application and Decision and Order, and (ii) increased volume
22 and complexity of activity already occurring and further expected in respect of
23 regulatory policy, law and compliance matters consistent with the priorities
24 highlighted in the 2023-2026 OEB Business Plan and the Ministry of Energy's
Powering Ontario's Growth report which outlines actions to support economic

¹⁷Customer Information System is a Tier 1 application described in Exhibit 2B, Section E8.4.

1 growth, decarbonization and the ongoing transformation of Ontario's electricity
2 system.

- 3 • inflationary cost pressures, including compensation increases consistent with
4 the evidence outlined in Exhibit 4, Tab 4, Schedule 4.

5

6 2025-2029 Variance Explanation

7 Between 2025 and 2029 costs in this program are expected to increase by \$1.5 million, or
8 an average of \$0.4 million per year, to maintain the resourcing capacity and capabilities
9 required to support the increased volume and complexity of work in this segment
10 discussed above. If Toronto Hydro were forced to deliver this segment with a reduced
11 level of funding over the 2025-2029 rate period, the utility could face various regulatory
12 compliance risks and drawbacks, including:

- 13 • Incorrect wholesale settlement filings, which would adversely affect the cash flow
14 of the utility or the IESO and disrupt the settlement and reimbursement of a broad
15 range of charges;
- 16 • Errors in the Tariff of Rates and Charges that would result in billing inaccuracies,
17 increased volumes of customer complaints and customer dissatisfaction;
- 18 • Non-compliance or incorrect implementation of new requirements, policies or
19 programs resulting in increased customer complaints, and potentially
20 compromising the advancement of public policy objectives;
- 21 • Costlier and less effective energy policies due to Toronto Hydro not being
22 sufficiently engaged in public policy development processes;
- 23 • Unmet OEB evidentiary requirements or expectations as part of the rate-setting
24 processes and other regulatory applications;

- 1 • Inadequate strategic business support on regulation or policy driven matters,
2 hampering the utility’s ability to effectively respond to emerging needs and
3 evolving industry circumstances; and
- 4 • Failure to meet important regulatory reporting requirements on time, such as the
5 OEB Scorecard or RRR filings.

6

7 **7. COMMUNICATIONS AND PUBLIC AFFAIRS SEGMENT**

8 **7.1 Segment Description**

9 The Communications and Public Affairs segment maintains open channels of
10 communications between Toronto Hydro and its customers, stakeholders, media, general
11 public and other interested parties. Through effective and timely communication and
12 engagement, the utility aims to build trust and customer satisfaction to maintain Toronto
13 Hydro’s strong brand and reputation.

14

15 Toronto Hydro engages in these activities through the following functional areas: Media
16 and Public Relations, Municipal Relations/Office of the President and Community
17 Relations. Working together, these three groups deliver high-quality, practical and timely
18 proactive and reactive information about Toronto Hydro’s operations and programs.

19

20 To perform the activities in this segment, Toronto Hydro uses a number of different
21 channels,¹⁸ including:

- 22 • Owned media channels (content that is published on channels that Toronto Hydro
23 creates or controls). e.g. website, social media, print newsletters, email
24 newsletters/blasts, bill inserts, customer bill, mobile app, media events,
25 community events, Interactive Voice Response);

¹⁸ These channels are regularly reviewed and updated to reflect customer feedback and preferences.

- 1 • Paid media channels (third-party channels that require payment from Toronto
2 Hydro). e.g. newspaper advertising, radio advertising, direct mail;
- 3 • Earned media channels (content about Toronto Hydro that comes voluntarily from
4 others) such as media outlets;
- 5 • Customer engagement surveys about general customer satisfaction and brand
6 trust and focus groups on individual topics and business decisions;
- 7 • Contact with local business improvement organizations, community groups and
8 ratepayer associations;
- 9 • Proactive outreach to City Councillors, the Mayor’s office and City staff;
- 10 • Community events; and
- 11 • Capital program and planned outage communications through the Community
12 Relations Office.

13

14 Effective and timely communication within each work function is critical for customers
15 and other stakeholders as it increases awareness about matters of interest such as
16 planned and unplanned power outages, information about where capital projects are
17 being conducted, and services and programs offered by Toronto Hydro.

18

19 Increasingly, Toronto Hydro is seeing more diverse and higher volumes of
20 communications. There are several factors driving this increase, including changes in how
21 customers communicate and increasing focus on the energy transition. Since 2020, there
22 have been more than 45,000 online mentions of Toronto Hydro, and the utility has
23 resolved 5,226 customer issues via social media.

24

25 As technology changes, customers increasingly expect Toronto Hydro to provide frequent
26 and near real-time updates about outages via numerous digital channels. According to

1 industry research, effective communications during outages is a key driver of customer
2 satisfaction.¹⁹ During major events, it is not uncommon for Toronto Hydro to receive
3 hundreds of social media mentions in a short period of time, as well as dozens of inquiries
4 from media and through the Office of the President. This growing volume of requests
5 increases the need for more frequent communications, and additional resources to help
6 manage this need. By communicating key information proactively, stakeholders and
7 customers may also have fewer reasons to contact Toronto Hydro reactively.

8
9 In addition, as the city of Toronto shifts towards electrification, the Communications and
10 Public Affairs teams are dealing with a more diverse customer base and more complexity
11 in terms of the number of topics and issues that this team needs to be prepared to
12 address. For example, increased volume and complexity in how customers connect to the
13 grid can result in more varied communication as customers have varying needs and
14 relationships with Toronto Hydro.

15
16 Collectively, all of these trends contribute to the segment's resourcing needs, as the
17 increased complexity and evolving nature of customer needs and communications
18 require Communications and Public Affairs staff to possess a diverse array of media-aware
19 and technology-oriented skillsets.

20
21 *7.1.1 Media and Public Relations*

22 As the customer landscape changes, Media and Public Relations is faced with managing
23 an increasing number of communications channels, a broader range of customers and has
24 a wider range of topics to communicate about. In addition, increased customer
25 engagement is required to understand these evolving needs to help ensure that

¹⁹ Chartwell Inc., *2022 Residential Consumer Survey*, online: <<https://chartwellinc.com/>>.

1 communications are being executed effectively, and in-line with customer expectations.
2 In order to effectively manage this expanding work, the function is continuing to increase
3 and expand its skillset through training and additional resources to effectively meet the
4 changes in customers' needs and expectations.

5

6 The Media and Public Relations function is responsible for external communications at
7 Toronto Hydro, which includes several core functions:

- 8 • Strategic customer and stakeholder communications (development of
9 communications strategies and materials);
- 10 • Customer engagement (facilitation of primary and secondary research studies
11 that enable Toronto Hydro to gather critical information to help inform business
12 decisions);
- 13 • Digital communications (management of digital communications channels, such
14 as website and social media, as well as supporting the development of digital
15 tools, like Toronto Hydro's mobile app);
- 16 • Media relations, and
- 17 • Issues management to help the organization detect and respond appropriately to
18 emerging issues and trends, as well as changes in its operating environment.

19

20 Toronto Hydro also considers direct customer feedback and the advice of a Customer
21 Advisory Panel ("CAP"). The CAP includes six sub-panels selected through a multi-step
22 process to ensure representation from a diverse cross-section of customers. The utility
23 engages the CAP to obtain ongoing feedback on a variety of topics through a mix of focus
24 groups, surveys, and workshop sessions for both residential and business customers.

1 Toronto Hydro's customer base is becoming larger, more diverse, and more sophisticated.
2 As the city of Toronto continues to grow, more customers are turning to electricity to
3 power their homes, businesses, and transportation, and some are also installing
4 distributed energy resources such as battery storage and solar panels.

5

6 Toronto Hydro will need to ensure it has updated information to assist customers in
7 connecting these new technologies to Toronto Hydro's distribution system and the
8 appropriate channels to effectively communicate such information. This communications
9 effort will require the Media and Public Relations team to understand the increasingly
10 diverse needs of customers – including through customer engagement – to ensure
11 communications are tailored appropriately as the energy transition takes hold.

12

13 To prepare the grid for the energy transition, there will also be an increasing amount of
14 work taking place in various neighbourhoods across the city. This, in turn, increases the
15 demand on the Media and Public Relations team to educate and inform customers about
16 the purpose of the work being completed. The Media and Public Relations team will have
17 a significant role to play in educating the public about the investments Toronto Hydro is
18 making to adapt and prepare for the energy transition and the changes in the way
19 customers use electricity.

20

21 Along with the development of strategic communications and facilitation of collecting
22 customer feedback, media relations, digital communications and issues management are
23 also of critical importance when it comes to managing Toronto Hydro's brand and
24 reputation.

1 The media serves as an important conduit between Toronto Hydro and its customers and
2 other stakeholders. The segment's media relations function proactively and reactively
3 communicates accurate and timely information about Toronto Hydro's programs,
4 services and operations, including power outages, electrical safety, rates, and
5 investments in the distribution system.

6

7 Media relations and the digital team have a significant role to play during emergency
8 outage situations. Throughout the duration of these outages, communications staff
9 often remain in contact with media outlets until services are restored. Media
10 representatives receive up-to-date information on suspected outage causes, likely
11 duration, and if necessary, appropriate measures to be taken for the protection of the
12 public and Toronto Hydro's and customer-owned equipment. These efforts help
13 disseminate key information to customers at a time when they are most likely to be
14 looking for it.

15

16 Dedicated media relations personnel engage reporters directly on all matters, which
17 allows the dispatched crews and other employees to proceed with their work safely and
18 without interruption.

19

20 Increasingly, digital channels, including social media and online tools, such as Toronto
21 Hydro's mobile application, SMS notifications, and live online chat, are becoming the
22 preferred source of information for customers experiencing an outage. The digital team
23 focuses on engaging the public through these channels and actively messages those who
24 engage Toronto Hydro via X (formerly known as Twitter) during outages. As of July 2023,
25 Toronto Hydro has over 121,400 followers on X (formerly known as Twitter),
26 approximately 40%-60% more followers than the other three large distributors in the

1 province. Media also rely on digital channels to collect information, increasing its
2 importance and creating an opportunity for Toronto Hydro to use this channel as an
3 additional communications tool with media.

4

5 In terms of public safety, as part of its daily operations, the team also responds to safety
6 questions reported through social media and shares these reports with the appropriate
7 operational teams, seven days a week.

8

9 For both media relations and social media, Toronto Hydro has after-hours standby for
10 evenings and weekends, and 24/7 support during significant outages.

11

12 The Media and Public Relations function also leads an internal issues management
13 process to help the organization proactively detect and respond to emerging issues and
14 trends, such as customer escalations and developing media stories, as well as changes in
15 the external environment such as changing attitudes towards government, and the cost-
16 of-living crisis. Issues management is a cross-functional process that allows many
17 functions within the organization to work together to help address customer and
18 stakeholder requirements in a timely and effective manner, and help manage Toronto
19 Hydro's reputation in the industry and the community.

20

21 *7.1.2 Municipal Government Relations/Office of the President*

22 Managing relationships with key City stakeholders contributes to improved utility
23 performance and customer outcomes. These relationships allow Toronto Hydro to
24 monitor for emerging risks to utility work, resolve points of conflict, and provide timely
25 information to the City, particularly during extended or highly impactful outages. Like
26 other organizations that construct and maintain infrastructure in Toronto, establishing

1 and enhancing relationships with municipal stakeholders is critical to Toronto Hydro's
2 ability to serve its customers and stakeholders efficiently. City policy and infrastructure is
3 increasing in its volume and complexity and is expected to continue. The elevated levels
4 of work expected to be undertaken by the City of Toronto in the coming years is clear
5 from the City's 2023 10-year capital plan which has increased to \$49.3 billion, up from
6 \$26 billion five years ago.²⁰ City climate policy – specifically TransformTO and its Net Zero
7 Strategy – is animating climate action across the City and at City-owned buildings,
8 requiring greater and improved coordination with Toronto Hydro.

9
10 Toronto Hydro routinely meets with City staff on a range of ongoing and emerging issues,
11 oversees a robust councillor engagement process, and actively participates in City-led
12 committees and working groups to advance the utility's interests. Municipal Government
13 Relations also maintains a process to monitor City Council items for potential
14 consequences for Toronto Hydro and its ratepayers and provide the company with
15 strategic advice on any relevant bylaw changes. For example, in 2020 at the outset of
16 COVID, the City developed the CafeTO program to allow bars and restaurants to construct
17 temporary patios in curb lane of certain streets. Action by Toronto Hydro resulted in
18 electrical safety and reliability considerations being incorporated into the original
19 program guidelines and subsequent revisions, allowing capital work and outage
20 restoration activities to proceed more efficiently and proactively maintaining safe
21 distances from electrical equipment.

22

23 Customer escalations for complex cases are managed through a multi-stage dispute
24 resolution process. The Office of the President handles approximately 1,000 issues per

²⁰ City of Toronto. *2023 City of Toronto Budget Summary*, online: <<https://www.toronto.ca/wp-content/uploads/2023/05/95f8-2023-City-of-Toronto-Budget-Summary.pdf>>

1 year, with approximately two-thirds directed to it from councillors and other elected and
2 public officials. The remaining third is comprised of the second level in the customer
3 dispute resolution process if customers are not satisfied with the outcome of their initial
4 contact with frontline customer facing teams. The Customer Advocate is the final step
5 within Toronto Hydro's complaint process and reviews cases for customers unsatisfied
6 with responses provided by Toronto Hydro. The Customer Advocate reviews assess
7 whether:

- 8 • Toronto Hydro's internal processes and policies were applied fairly;
- 9 • All facts and evidence were incorporated in reaching a decision;
- 10 • Complaints were addressed promptly; and
- 11 • Comprehensive reasons were provided to support Toronto Hydro's decision.

12
13 Of the approximately 1,000 issues managed through the Office of the President in 2022,
14 over 98% were successfully resolved without a formal Customer Advocate review.

15 16 *7.1.3 Community Relations*

17 As the industry evolves, so does Toronto Hydro's commitment to customer service and
18 the community. Toronto Hydro has comprehensive processes and protocols for
19 communicating information to customers concerning planned capital work and planned
20 outages, in order to provide a better understanding of the capital program and to help
21 prepare customers for work at or near their property.

22
23 Toronto Hydro issues proactive communications to notify customers of planned work,
24 and also has a customer inquiry line and escalation process for customers. Community
25 Relations staff are dispatched on-site, when needed, to liaise with customers. This
26 process is critical for building brand trust and reputation management.

1 Toronto Hydro maintains productive relationships with public interest groups and
2 agencies involved in commerce, environmental protection, and education. Stakeholder
3 outreach commonly takes the form of one-on-one contact with customers, community
4 town hall meetings, special information sessions, and a variety of online content. Using
5 a variety of communication channels allows Toronto Hydro to engage customers with
6 varying needs, concerns, and preferences, with the goal of giving appropriate attention
7 to all customer segments.

8

9 Toronto Hydro continues to make investments in sustaining the grid, but is also planning
10 for new investments and projects to build capacity and enable growth and electrification.
11 As the city continues to grow, so does its infrastructure. These changes require additional
12 work to be done by Toronto Hydro to support the expansion and modernization of other
13 services. This means Toronto Hydro is rebuilding or relocating infrastructure to support
14 City water work, Metrolinx, TTC expansion, development and third-party communication
15 upgrades.²¹ Over the course of the 2025-2029 period, the capital program associated with
16 system access, renewal and service is increasing by 47 percent relative to the 2020-2024
17 period. All of this work means that communications supporting capital projects will
18 continue to grow in importance and frequency.

19

20 In preparation for this increasing volume and complexity of projects, Community
21 Relations is reviewing its existing processes to help identify opportunities for modernizing
22 that will allow Toronto Hydro to better communicate with customers and stakeholders.

23

24 In particular, planned improvements to Toronto Hydro's website will allow for an
25 enhanced construction and outage map to more accurately identify project areas. The

²¹ *Supra* note 4.

1 content on the website will also be expanded to include more detailed information about
 2 the utility’s work, including photos, equipment and construction descriptions and project
 3 status updates and general information.

4

5 In addition, potential expansion of the channels through which planned outages are
 6 communicated will also be critical for maintaining Toronto Hydro’s commitment to
 7 Customers and the community. Social media, text message/SMS and email
 8 communications are all being considered as additional communications channels.

9

10 To maintain expected service levels, the need for additional software, technology and
 11 resources to support this increasing volume and complexity of projects will need to be
 12 evaluated. Resources to provide dedicated support to these large-scale projects for
 13 enhanced community engagement may also need to be considered.

14

15 **7.2 Communications and Public Affairs Segment Costs**

16 Table 7 presents Toronto Hydro’s Historical (2020-2022), Bridge (2023-2024), and
 17 Forecast Years (2025-2029) costs relating to the Communications and Public Affairs
 18 segment.

19

20 **Table 7: Communications and Public Affairs Segment Expenditures (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Communications & Public Affairs	3.6	4.1	4.1	5.5	6.4	6.6	6.9	7.1	7.3	7.6

21

22 2020 – 2021 Variance Explanation

23 Between 2020 and 2021 costs in this segment increased by \$0.5 million. This is primarily
 24 attributed to:

- 1 • increases in payroll costs due to inflationary increases, and
2 • increase in marketing costs associated with a gradual return to pre-pandemic
3 levels of communication following COVID-19.
4

5 2021 – 2022 Variance Explanation

6 There is no variance in this segment between 2021 and 2022.
7

8 2022 – 2025 Variance Explanation

9 Between 2022 and 2025 costs in this segment are expected to increase \$2.5 million or
10 an average of \$0.8 million per year primarily due to the following:

- 11 • increase due to inflationary cost pressures, including compensation increases
12 consistent with the evidence outlined in Exhibit 4, Tab 4, Schedule 4;
13 • incremental resources to support an additional focus on digital communications
14 channels and increasing customer expectations, and
15 • increase in advertising, event, and market research costs associated with meeting
16 increasing customer expectations, including an increasing number of
17 communications channels and the need for more timely and frequent
18 communications.
19

20 2025-2029 Variance Explanation

21 Between 2025 and 2029 costs in this segment are expected to increase by \$1 million, or
22 an average of \$0.3 million per year to maintain the resourcing capacity and capabilities
23 that are required to support the increased volume and complexity of work in this
24 segment. If Toronto Hydro were forced to deliver this segment with a reduced level of
25 funding over the 2025-2029 rate period, the utility could face various customer-related
26 and stakeholder-facing risks, including:

- 1 • Increased frequency of inaccurate or delayed information resulting in customer
2 confusion and dissatisfaction;
- 3 • Inability to meet Toronto Hydro’s strategic priorities such as modernizing business
4 processes and adopting new tools to meet the changes in customer’s needs and
5 expectations in response to electrification;
- 6 • Reduced ability to announce the timing, scope and customer impact of Toronto
7 Hydro’s capital projects, resulting in resident confusion and dissatisfaction;
- 8 • Increased number of issue escalations, with overall diminished customer and
9 stakeholder satisfaction;
- 10 • Weakened relationship with members of the media due to lack of communication,
11 resulting in increased potential for the dissemination of misinformation or
12 negative information;
- 13 • Decreased understanding of customer perceptions and preferences, resulting in
14 misalignment with customer expectations;
- 15 • Reduced uptake in key corporate programs and services such as the Low-Income
16 Energy Assistance Program (“LEAP”) due to lack of awareness/marketing,²² and
17 • An increased potential for brand and reputation decline, resulting in loss of
18 customer trust and faith in Toronto Hydro and diminished customer satisfaction.

²² Exhibit 4, Tab 2, Schedule 19.

1 **CHARITABLE DONATIONS AND LOW-INCOME ENERGY ASSISTANCE**
 2 **PROGRAM (“LEAP”)**

3
 4 **1. CHARITABLE DONATIONS**

5 Toronto Hydro is an important corporate contributor in the city of Toronto and supports
 6 outreach events that engage the community, advance energy related issues of public
 7 importance (such as safety and sustainable energy), and promote programs and services
 8 that help customers, particularly those that are most vulnerable.

9
 10 Table 1, below, provides Toronto Hydro’s Historical (2020-2022), Bridge (2023-2024), and
 11 Forecast Year (2025-2029) charitable contributions.

12
 13 **Table 1: Charitable Contributions Summary (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Rate Recoverable	1.0	1.0	1.0	1.3	1.4	1.5	1.6	1.7	1.8	1.9
Non-Rate Recoverable	0.1	0.1	0.1	-	-	-	-	-	-	-

14
 15 Toronto Hydro’s sole rate recoverable charitable contributions for the 2025-2029 rate
 16 period are its payments towards the OEB’s Low-Income Energy Assistance Program
 17 (“LEAP”). As discussed in greater detail in section 3 below, the utility is requesting the
 18 OEB’s permission to increase its LEAP funding allocation for the 2025-2029 rate period
 19 and targeted exemptions from the Ontario Electricity Support Program (“OESP”) & LEAP
 20 Program Manual (the “Manual”) to more effectively promote and operate LEAP for the
 21 benefit of its low-income customers.¹

¹ OESP and LEAP Program Manual (October 2015).

1 Toronto Hydro's non-rate recoverable charitable contributions are comprised of multiple
2 minor sponsorships of community not-for-profits, industry associations, City of Toronto
3 entities, and events of strategic alignment. The following are examples of causes the
4 utility has made contributions to:

- 5 • Not-for-profit entities (e.g. Tree Canada, which supports planting and nurturing
6 trees in rural and urban environments and Pembina Institute, which performs
7 research on energy policy matters);
- 8 • Industry associations (e.g. Ontario Energy Association and Ontario Energy
9 Network, which provide a voice to the energy industry, an opportunity to network
10 and share best practices, and the furthering of industry issues publicly and at
11 various levels of government); and
- 12 • City entities or events of strategic alignment (e.g. Toronto Region Board of Trade,
13 Cycle Toronto, and Cavalcade of Lights, which provide opportunities to engage
14 with communities regarding issues that align with Toronto Hydro's Corporate
15 Social Responsibility Strategy and promote programs and services).

16
17 Sponsorships can be used to align with business development strategies to further
18 Toronto Hydro's network and presence in areas of interest to the public (e.g. electric
19 vehicles). Each sponsorship is reviewed according to an established process and matrix
20 to gauge appropriateness and optimal level of support.

21
22 **2. POLITICAL CONTRIBUTIONS**

23 Toronto Hydro does not make political contributions of any kind.

3. LOW-INCOME ENERGY ASSISTANCE PROGRAM (“LEAP”)

Toronto Hydro proposes to increase its LEAP funding allocation for the 2025-2029 rate period from the default 0.12 percent of its total (service) distribution revenue requirement to 0.15 percent, which would amount to approximately \$8.5 million. Furthermore, the utility plans to top up rates funding with its surplus LEAP funds and requests targeted exemptions from the Manual for itself and its lead and intake agencies to implement several operational changes to enhance the administration of LEAP in Toronto Hydro’s service territory, as discussed below.

Table 2: Toronto Hydro’s 2025-2029 LEAP Funding Plan (\$ Millions)²

	Rates Funding – 0.15% of Revenue Requirement (A) (\$ M)	LEAP Funds Carried Over from Previous Years (B) (\$ M)	Total Annual Funding (A + B) (\$ M)	15% Agency Admin Fees (\$ M)	Total Funds Available for LEAP Disbursements (\$ M)	Estimated Customers Assisted / Year (approx.)
2025	\$1.5	\$0.5	\$2.1	\$0.3	\$1.8	1,800
2026	\$1.6	\$0.5	\$2.1	\$0.3	\$1.8	1,800
2027	\$1.7	\$0.5	\$2.2	\$0.3	\$1.9	1,900
2028	\$1.8	\$0.5	\$2.3	\$0.4	\$2.0	2,000
2029	\$1.9	\$0.5	\$2.4	\$0.4	\$2.1	2,000
TOTAL	\$8.5	\$2.6	\$11.2	\$1.7	\$9.5	9,500

3.1 Proposed Enhancements to LEAP

As part of its business planning for the 2025-2029 rate period, through a variety of channels Toronto Hydro obtained customers’ feedback on their experience with accessing financial assistance under LEAP. In general, customers expressed that 1) the application

² Variances due to rounding may exist. Column “B” shows the cumulative LEAP funds carried over from the 2020-2024 rate period spread out over the 5 years of the 2025-2029 rate period.

1 process for LEAP is difficult and should be simplified to facilitate access to grants, and 2)
2 the utility can do more to promote LEAP to eligible customers.

3

4 Meanwhile, several macroeconomic factors that materialized during the 2020-2024
5 period, such as the effects of the COVID-19 pandemic, higher than average inflation and
6 interest rates, and rising costs of living, have significantly affected vulnerable customers'
7 ability to pay their electricity bills. As an illustration, the number of Toronto Hydro's
8 eligible low-income customers ("ELIC") in arrears increased by approximately 14% from
9 2020 to 2021 and by approximately 34% from 2021 to 2022. Similarly, the total dollar
10 amount of arrears on ELIC accounts increased by approximately 19% from 2020 to 2021
11 and by approximately 40% from 2021 to 2022. From 2022 to 2023, Toronto Hydro
12 estimates that the number of ELIC in arrears will continue to increase by 16%, while the
13 total dollar amount of arrears on ELIC accounts will decrease by approximately 20%.
14 Therefore, the total number of ELIC in arrears and the total dollar amount of arrears on
15 ELIC accounts are still 20% and 129% greater than pre-pandemic levels in 2019,
16 respectively.

17

18 In recent years, 1,000 Toronto Hydro customers on average received LEAP assistance per
19 year (See Figure 1). In the utility's assessment, the 2020 and 2021 years are not
20 representative of typical volumes of assistance due to the distortionary effects of the
21 COVID-19 pandemic, the extended disconnection moratoriums and Toronto Hydro's
22 customer-forward collections policies (as discussed in the Customer Care program),³ and
23 other financial assistance programs "competing" with LEAP.

³ Exhibit 4, Tab 2, Schedule 14.

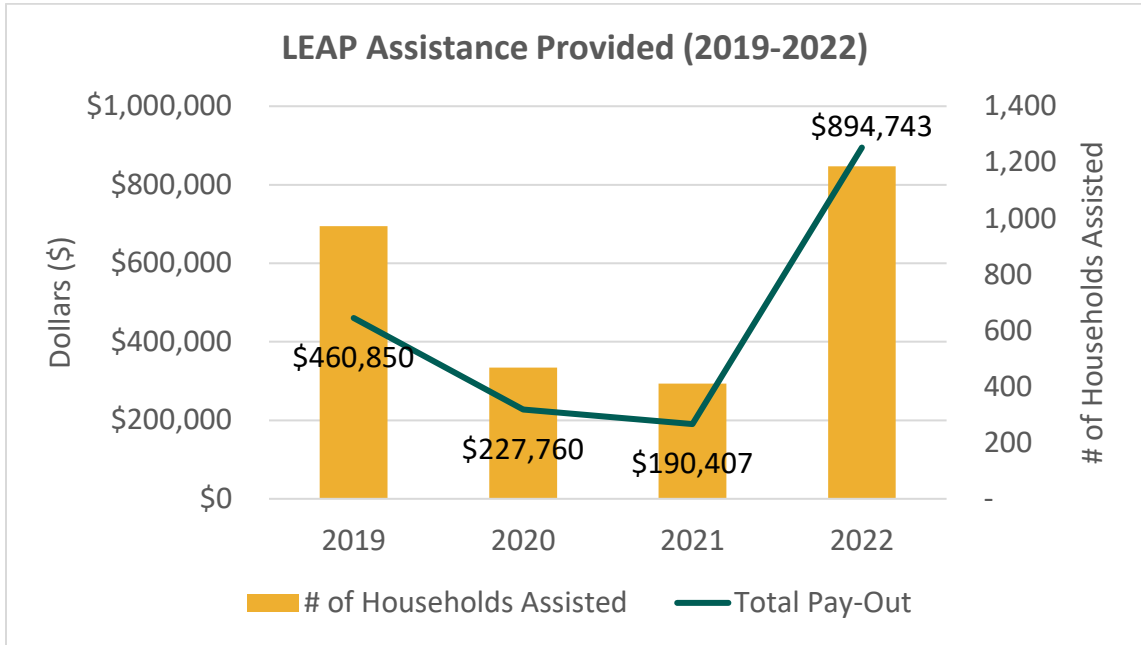


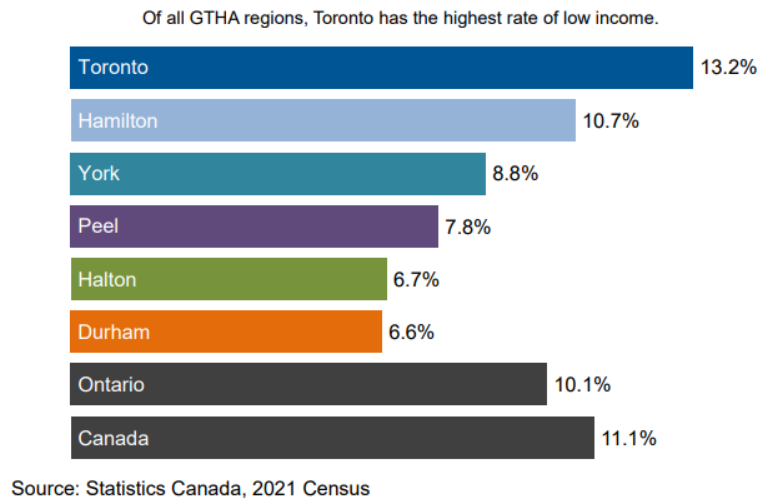
Figure 1: LEAP Assistance Provided (2019-2022)

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Based on the trending shown above, in Figure 1, Toronto Hydro expects that many of its customers will likely continue to face financial difficulties well into the 2025-2029 rate period. In addition to the bill impacts from the rates Toronto Hydro is requesting through this application, other charges on electricity bills may also continue increasing throughout 2025-2029, as other stakeholders in the industry adjust their rates and levies, and energy transition policies take effect.

The demographics of Toronto Hydro’s service territory also shed light on the need to provide vulnerable customers robust assistance through the energy transition. For example, the City of Toronto’s analysis of the 2021 Census shows that the proportion of low-income households in Toronto is higher compared to all other regions in the Greater Toronto and Hamilton Area and both Ontario and national averages (See Figure 2 below).

1 As of 2021, there were 363,955 persons, or 13.2% of the population in Toronto, with an
2 income below Statistics Canada's Low-Income Measure After Tax ("LIM-AT").⁴



3 **Figure 2: Prevalence of Low-Income After-Tax Households ("LIM-AT") for the Greater**
4 **Toronto and Hamilton Area, Ontario and Canada, 2021⁵**

5
6 Against this backdrop, Toronto Hydro recognizes that it has a role to play in providing
7 effective support to its low-income customers throughout the 2025-2029 rate period and
8 proposes to implement various enhancements to its administration of LEAP to increase
9 the annual average number of customers assisted to approximately 1,900 per year or over
10 9,000 over the five-year period.

11
12 To enable this outcome, Toronto Hydro is requesting the OEB's permission on the
13 following matters for the duration of the 2025-2029 rate period.

⁴ City of Toronto Backgrounder, *2021 Census: Families, households, Marital Status and Income* (July 19, 2022), online: <<https://www.toronto.ca/wp-content/uploads/2022/07/9877-City-Planning-2021-Census-Backgrounder-Families-Hhlds-Marital-Status-Income.pdf>>.

⁵ *Ibid.*

1 1. Continue the flexibility for LEAP eligibility criteria permitted by the OEB in its letter
2 dated February 27, 2023.

3 On February 27, 2023, the OEB issued a letter to licensed electricity distributors, LEAP
4 lead agencies, and other industry participants to extend the flexibility of two specific
5 program requirements through 2023.⁶ These requirements are:

- 6 • To be eligible for LEAP emergency financial assistance, an applicant needs to be in
7 arrears but does not need to be in threat of disconnection or have been
8 disconnected; and
- 9 • Applicants can receive LEAP emergency financial assistance more than once per
10 year subject to the maximum annual household grant amount.⁷

11

12 Toronto Hydro submits that the continuation of these measures into the 2025-2029 rate
13 period is warranted, as it expects the conditions that informed the OEB’s decision to
14 increase flexibility for emergency financial assistance recipients under LEAP and the
15 economic circumstances discussed above to persist in Toronto Hydro’s service area.

16

17 2. Increase the maximum grant amounts per household per year from \$500 to \$1,000
18 (from \$600 to \$1,200 for electrically heated households).

19 Similar to the previous request, Toronto Hydro submits that increasing the maximum
20 grant amounts for the 2025-2029 rate period is warranted as it expects the circumstances
21 that informed the OEB’s decision to double grant amounts in 2022 and the economic
22 circumstances discussed above to persist in Toronto Hydro’s service area.⁸ The OEB’s
23 rationale at that time was to increase the flexibility and effectiveness of LEAP emergency

⁶ OEB Letter, *Providing Flexibility to Consumers through the Low-income Energy Assistance Program – Emergency Financial Assistance*, (February 27, 2023).

⁷ Currently, the maximum allowable grant is set at \$500 (\$600 for electrically heated households). *Supra* note 6.

⁸ OEB Letter, *Providing Flexibility to Assist Consumers through the Low-income Energy Assistance Program – Emergency Financial Assistance* (January 10, 2022).

1 financial assistance when customers were facing higher than normal arrears and many
 2 utilities had large balances of unused funding carried over from previous years. As
 3 previously discussed, Toronto Hydro’s empirical data suggests that higher than normal
 4 arrears for the utility’s customers may very likely persist into the 2025-2029 rate period.

5
 6 Increasing the maximum grant amounts per household as requested, in combination with
 7 the LEAP funds expected to carry over from the 2020-2024 rate period, would increase
 8 the effectiveness and expand the reach of the program in the 2025-2029 rate period.

9
 10 **3. Increase the annual rate funding allocation for LEAP from 0.12% to 0.15% of**
 11 **Toronto Hydro’s revenue requirement.**

12 Toronto Hydro submits that a modest increase in its LEAP funding allocation would
 13 support the utility’s ability to provide assistance to more customers over the 2025-2029
 14 rate period, without any material impacts to any other funding requirements. This
 15 increase, in combination with the other measures proposed herein, would enable an
 16 increase of approximately 50% in the number of LEAP recipients, as discussed below.

17
 18 **Table 3: Rates-Funded LEAP Allocation of 0.15% of the Revenue Requirement**
 19 **(\$ Millions)**

	2025	2026	2027	2028	2029	Total
0.15% Allocation	1.5	1.6	1.7	1.8	1.9	8.5

1 4. Exempt Toronto Hydro and its lead and intake agencies from steps 1 through 7 of
2 section 3.3 of the OESP & LEAP Manual to increase the flexibility of the customer
3 application process.
4

5 As previously discussed, the feedback that Toronto Hydro collected from its customers
6 indicates that applicants find the LEAP application process to be time-consuming and
7 difficult to navigate. Certain procedural requirements embedded in the Manual and
8 currently used by lead and intake agencies, such as pre-screening by phone, in-person
9 interviews, lead agency reviews (if applicable), or the separate verification and
10 communication with the utility, add to the average time for processing applications and
11 sometimes discourage customers from carrying through their application to completion,
12 or from re-applying in the future. To address these challenges, Toronto Hydro proposes
13 to work with its lead and intake agencies to make small, incremental changes to existing
14 procedures and modernize the process in favour of customers, while still retaining robust
15 controls for the application of eligibility requirements, the protection of customer privacy,
16 and good governance of assistance funds.

17

18 Examples of procedural improvements that the utility may explore with its lead and intake
19 agencies include:

- 20 • Having agencies conduct interviews virtually over Zoom or similar technologies;
- 21 • Allowing the submission of applicant documents and other communications via
22 email and/or other electronic means;
- 23 • Having agencies refer to previously obtained and current applicant information
24 for re-applications within the same calendar year; and
- 25 • Providing easily accessible information resources for applicants.

1 In order to implement measures such as the above, Toronto Hydro requests the OEB to
2 exempt the utility and its lead and intake agencies from steps 1 through 7 of the Manual.

3

4 Toronto Hydro submits that the four proposals discussed above would enable the utility
5 and its agencies to deliver financial assistance in the most effective and targeted manner
6 to the customers that need it the most. The utility further submits that the experience it
7 will gain in modernizing its administration of LEAP as proposed may yield valuable
8 insights, which Toronto Hydro is willing to share with the OEB and the industry through
9 the Financial Assistance Working Group or by other means as the OEB may direct.

10

11 **3.2 LEAP Expenditure Summary**

12 To determine the optimal level of funding for the 2025-2029 rate period, Toronto Hydro
13 completed a detailed analysis of historical LEAP data pertaining to the number of grants
14 and disbursement amounts.

15

16 Although the number of households receiving LEAP has remained relatively flat since 2019
17 (except for 2020 and 2021, which the utility deems to be outlier years due to the effects
18 of the COVID-19 pandemic), the amount of unused LEAP funds carrying over from
19 previous years has been growing during the current rate period, as shown in Table 4
20 below.

1 **Table 4: LEAP Contributions and Disbursements for the 2020-2024 rate period (\$000s)**

	2020 Actual	2021 Actual	2022 Actual	2023 Bridge	2024 Bridge
Annual Contribution	958	958	958	958	958
Carryover from Prior Years	737	1,468	2,349	TBD	TBD
One-Time Contribution	-	113 ⁹	-	-	-
Total Available¹⁰	1,694	2,539	3,307	TBD	TBD
Total Disbursed (including agency administration fees)¹¹	227	190	893	TBD	TBD
Total Unused	1,468	2,349	2,414	TBD	TBD

2

3 Toronto Hydro's plan to increase the accessibility and reach of LEAP and the permissions
 4 it requests from the OEB for the 2025-2029 rate period is outlined in section 3.1 above.
 5 In implementing this plan, the utility is going to deploy:

- 6 1) \$8.5 million in rates funding allocation for LEAP, equivalent to 0.15% of the revenue
 7 requirement, and
 8 2) the estimated \$2.6 million in surplus LEAP funds carried over from the 2020-2024 rate
 9 period.

10 This amounts to a total allocation of approximately \$11.2 million for 2025-2029. Net of
 11 the 15% annual agency administration and program delivery fees, the utility will have
 12 approximately \$9.5 million available for LEAP disbursements. Table 5 below shows the
 13 estimated number of assisted households/customers, if Toronto Hydro's four proposals
 14 discussed in section 3.1 are granted.

15

⁹ Represents a one-time contribution in 2021 is attributable to the credit amount that the OEB applied to Toronto Hydro's 2021-2022 costs assessment invoice from the OEB's administrative monetary penalty funds to supplement utilities' LEAP budgets for 2021. OEB Letter, *July 2021 Cost Assessment Invoice and Temporary Changes to the Screening Guidelines for the Low-income Energy Assistance Program – Emergency Financial Assistance*, (July 14, 2021).

¹⁰ The indicated amounts exclude funding and grants from the Pichette settlement funds, which are administered by United Way of Greater Toronto (see section 3.3 below).

¹¹ *Ibid.*

1 **Table 5: Toronto Hydro’s 2025-2029 LEAP Funding Plan (\$ Millions)¹²**

	Rates Funding – 0.15% of Revenue Requirement (A)	LEAP Funds Carried Over from Previous Years (B)	Total Annual Funding (A + B)	15% Agency Admin Fees	Total Funds Available for LEAP Disburse- ments	Estimated Customers Assisted Per Year
2025	\$1.5	\$0.5	\$2.1	\$0.3	\$1.8	1,800
2026	\$1.6	\$0.5	\$2.1	\$0.3	\$1.8	1,800
2027	\$1.7	\$0.5	\$2.2	\$0.3	\$1.9	1,900
2028	\$1.8	\$0.5	\$2.3	\$0.4	\$2.0	2,000
2029	\$1.9	\$0.5	\$2.4	\$0.4	\$2.1	2,000
TOTAL	\$8.5	\$2.6	\$11.2	\$1.7	\$9.5	9,500

¹² Variances due to rounding may exist. Column “B” shows the cumulative LEAP funds carried over from the 2020-2024 rate period spread out over the 5 years of the 2025-2029 rate period.

1 **COMMON COSTS AND ADJUSTMENTS**

2

3 **1. OVERVIEW**

4 This schedule describes Toronto Hydro’s costs that are not attributable to a specific
 5 program or would be administratively difficult or immaterial to allocate. The total
 6 expenditures associated with this schedule are comprised of ongoing or recurring costs
 7 and adjustments.

8

9 **Table 1: Common Costs and Adjustments (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Ongoing or Recurring	(0.2)	(0.3)	(1.0)	(1.1)	(0.9)	(0.9)	(0.9)	(0.8)	(0.8)	(0.8)
Total	(0.2)	(0.3)	(1.0)	(1.1)	(0.9)	(0.9)	(0.9)	(0.8)	(0.8)	(0.8)

10

11 **2. ONGOING OR RECURRING COSTS AND ADJUSTMENTS¹**

12 Ongoing or recurring costs and adjustments are comprised of the following expenditures
 13 described in further detail in the sections below.

14

15 **2.1 Difference in Forecast and Actual Employee Benefits Costs**

16 Toronto Hydro provides current employees with benefits that include medical, dental,
 17 and life insurance benefits, and includes a provision for employees’ future benefits.
 18 Benefit costs are allocated through the payroll process using budgeted rates. The actual
 19 costs for benefits are based on employee consumption. The difference between
 20 budgeted and the actual benefit costs incurred by the utility are reflected in this Schedule.

21

¹ The utility has not included any one-time costs for recovery.

1 **2.2 Investment Tax Credits (“ITC”)**

2 The Historical (2020-2022), Bridge (2023-2024), and Forecast Year (2025-2029) costs
3 reflect both refundable and non-refundable ITCs in compliance with International
4 Financial Reporting Standards (“IFRS”).²

5

6 **2.3 Financing Costs**

7 Financing costs are made up of standby fees, the amortization of the upfront and
8 arrangement fees for Toronto Hydro’s revolving credit facility, and letters of credit fees.

9

10 **2.4 Common Costs and Adjustments Year-over-Year Variance Analysis**

11 2020-2021 Variance Explanation

12 The decrease of \$0.1 million is primarily due to difference in forecasted and actual
13 employee benefits costs in 2021.

14

15 2021-2022 Variance Explanation

16 The decrease of \$0.7 million is primarily due to higher ITC credit received in 2022 and
17 difference in forecasted and actual employee benefits costs in 2022.

18

19 2022-2025 Variance Explanation

20 Between 2022 and 2025, Toronto Hydro forecasts immaterial increase of \$0.1 million due
21 to higher financing costs.

² Exhibit 6, Tab 2.

1 2025-2029 Variance Explanation

- 2 Toronto Hydro forecasts immaterial variances in common costs and adjustments over the
3 2025-2029 rate period, except for a forecasted increase of \$0.1 million from 2026 to 2027
4 due to higher financing costs.

1 **ALLOCATIONS AND RECOVERIES**

2

3 **1. OVERVIEW**

4 This schedule discusses the allocations and recoveries of Toronto Hydro’s total
 5 Operations, Maintenance, and Administration (“OM&A”) costs to reflect the recovery of
 6 certain expenditures such as warehousing, facilities, fleet and equipment, and
 7 Information Technology (“IT”) services obtained by internal user departments through
 8 other OM&A and/or capital programs and shared services.

9

10 **2. DESCRIPTION**

11 Table 1 below provides a breakdown of the historical (2020-2022), bridge (2023-2024),
 12 and forecast year (2025-2029) allocations to and recoveries from Toronto Hydro’s OM&A
 13 expenditures. The manner of allocation for each individual component is discussed in
 14 detail below.

15

16 **Table 1: Allocations and Recoveries Adjustments to OM&A (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
On-cost recovery	(13.2)	(12.9)	(14.2)	(16.9)	(19.1)	(21.7)	(23.7)	(25.1)	(25.7)	(27.3)
Fleet Recovery Offset	(9.6)	(9.8)	(9.4)	(10.3)	(10.7)	(11.0)	(11.3)	(11.5)	(11.8)	(12.2)
IT and Occupancy Charges	(0.8)	(0.8)	(0.6)	(0.8)	(0.8)	(0.9)	(0.9)	(0.9)	(0.9)	(0.9)
Shared Services	(1.0)	(2.3)	(1.5)	(3.0)	(2.9)	(3.4)	(3.0)	(3.2)	(3.4)	(3.8)
Other Allocated Costs	(0.9)	(0.8)	(0.8)	(0.4)	(0.4)	(0.5)	(0.5)	(0.5)	(0.5)	(0.6)
Total	(25.5)	(26.6)	(26.5)	(31.4)	(33.9)	(37.5)	(39.4)	(41.2)	(42.3)	(44.8)

17

18 **3. ON-COST RECOVERY**

19 On-cost recovery is a material handling surcharge applied to all inventory issuances from
 20 the warehouse by the Supply Chain OM&A program to both capital and operational

1 projects.¹ If the items issued from the warehouse are associated with capital projects,
2 the on-cost charge is capitalized, whereas if the items issued are associated with
3 operational projects, the on-cost charge is expensed in the period in which it is incurred.

4

5 The costs included in the on-cost recovery are mainly comprised of:

- 6 • Supply Chain OM&A program compensation costs;
- 7 • Directly attributable support costs; and
- 8 • Other warehouse costs (e.g. warehouse maintenance costs).

9

10 **4. FLEET RECOVERY**

11 The allocation of fleet costs is based on the number and type of vehicles used in projects
12 and contributes to Toronto Hydro's efficient utilization of vehicles in the Fleet and
13 Equipment Services program.² In the case of maintenance projects, the allocation
14 provides for a transfer of operating costs from the Fleet and Equipment Services program
15 to other programs using vehicles and equipment. In the case of capital projects, the
16 allocation provides for a transfer of operating costs to capital projects. The allocation to
17 capital is based on the nature of the work performed and follows Toronto Hydro's labour
18 costing methodology.

19

20 The costs included in the fleet allocation are mainly comprised of:

- 21 • Fleet and Equipment OM&A program compensation costs;
- 22 • Parts and materials;
- 23 • Vehicle insurance, licensing, and registration; and
- 24 • Other fleet costs.

¹ Exhibit 4, Tab 2, Schedule 13.

² Exhibit 4, Tab 2, Schedule 11.

1 The Fleet and Equipment Services program employs a vehicle “lease-rate” cost recovery
2 model, whereby vehicle expenses are recovered using a monthly user charge at the
3 vehicle class level (e.g. “Compact Car”, “Passenger Minivan up to 2,500 kilograms”). The
4 lease-rate is calculated on an annual basis to ensure that operating cost changes at the
5 vehicle class level are accurately reflected in user lease rates of the following year.

6

7 **5. IT AND OCCUPANCY CHARGES**

8 The allocation of IT charges to Toronto Hydro’s affiliates and non-rate regulated business
9 is based on support by the IT OM&A program to end users of IT assets and systems,
10 including directly attributable labour and support costs, and contributes to Toronto
11 Hydro’s efficient use of technology assets.³

12

13 The costs included in the IT allocation are comprised mainly of:

- 14 • IT OM&A program compensation costs; and
- 15 • Directly attributable support costs.

16

17 The allocation of occupancy charges and Facilities Management OM&A program costs is
18 based on square-footage and type of space used and contributes to the efficient use of
19 space within Toronto Hydro’s facilities.⁴

20

21 The costs included in the occupancy and facilities allocation primarily consist of:

- 22 • Facilities Management OM&A program compensation costs;
- 23 • Maintenance costs;
- 24 • Facilities costs;

³ Exhibit 4, Tab 2, Schedule 17.

⁴ Exhibit 4, Tab 2, Schedule 12.

- 1 • Utilities costs;
- 2 • Property taxes; and
- 3 • Property leases.

4

5 **6. SHARED SERVICES**

6 Toronto Hydro allocates shared services costs included in OM&A programs to its affiliate
7 corporations and the non-rate regulated business of the utility. For more information
8 about Toronto Hydro's shared services model and a description of Toronto Hydro's
9 corporate structure and governance, please respectively refer to Exhibit 4, Tab 5 and
10 Exhibit 1C, Tab 2, Schedule 1.

11

12 **7. OTHER ALLOCATED COSTS**

13 Other allocated costs represent costs which are not specifically attributed to an OM&A
14 program.

1 **PURCHASES OF NON-AFFILIATE SERVICES**

2

3 Toronto Hydro’s Procurement Policy (the “Policy”) establishes processes and protocols
4 for obtaining services, equipment, and materials that satisfy the operational needs of the
5 utility in a manner that appropriately balances cost and value. Toronto Hydro relies on a
6 comprehensive governance framework for its procurement activities. The Policy is set
7 out at Appendix A to this Schedule.

8

9 Procurement exceeding \$25,000 in value is sourced in accordance with Toronto Hydro’s
10 competitive procurement procedure, which outlines the general competitive bid process
11 and sets out various rules with respect to communications, negotiations, bid reviews, and
12 conflicts of interest. This formalized competitive bidding process helps ensure that the
13 procurement process remains fair, transparent, efficient, and consistent.

14

15 **1. SOLE SOURCING**

16 Where procurement is related to, amongst other things, unforeseeable circumstances or
17 where there is only one vendor uniquely qualified to deliver goods or services, Toronto
18 Hydro may use sole source procedures as described in the Policy.¹ When exercising the
19 option to perform sole source procurement, Toronto Hydro is often able to reduce the
20 cost of goods or services or improve the value proposition in other ways.

21

22 Before executing sole source procurements, Toronto Hydro conducts due diligence
23 reviews of the sole source purchase request. The reviews determine if the sole source
24 purchase is warranted, and include a review of the proposed contract’s specifications,
25 scope, definition, commercial terms, liabilities, and insurance requirements.

¹ See Appendix A to the Procurement Policy (Exception 4).

1 Proposed sole source procurements that pass the review process are finalized through
2 contract negotiations with the vendor. At that point, a purchase order is issued.

3

4 **2. PRE-QUALIFICATIONS FOR CONSTRUCTION CONTRACTS**

5 When Toronto Hydro contemplates a civil or electrical construction project, potential
6 contractors are pre-qualified in accordance with Toronto Hydro's pre-qualification
7 procedure. A contractor's pre-qualification signifies that the contractor has met the
8 minimum requirements established by Toronto Hydro for the purposes of a project. The
9 factors used for evaluating contractors at this stage include, but are not limited to,
10 technical skill and competence, experience, financial viability, health and safety record,
11 reputation, work load, and any previous relationship with Toronto Hydro.

12

13 All contracts are authorized and executed in accordance with Toronto Hydro's Signing
14 Policy. Toronto Hydro's signing authorization levels are approved by the Board of
15 Directors and delegated to individual members of the executive and senior management
16 of the utility to facilitate the day-to-day running of the business. Contracts must be signed
17 by an authorized person who is directly responsible for the budget related to the subject
18 area of the contract. Toronto Hydro's signing authorization levels for procurement
19 contracts are shown in Table 1, below.

1 **Table 1: Toronto Hydro’s Signing Authorization Levels for Procurement Contracts**

Category	President and CEO	CFO	Responsible Officer	Controller	General Manager	Director	Manager that is a direct report of an Officer
Procurement Signing Limit	Up to \$30M	Up to \$5M	Up to \$5M	Up to \$1M	Up to \$500,000	Up to \$250,000	Up to \$150,000

2

3 **3. COMPLIANCE CONFIRMATION**

4 Toronto Hydro confirms that its non-affiliate purchases are in compliance with the
5 utility’s Policy. Appendix B identifies non-affiliate services that were procured in 2020,
6 2021, 2022, and 2023 under the exceptions to the general procurement rules
7 contemplated within the Policy. These engagements did not originate from a
8 competitive procurement process and surpass the utility’s materiality threshold of \$1
9 million.



POLICY

PROCUREMENT	<u>Policy Owner:</u> Executive Vice-President Planning & Chief Engineering & Modernization Officer (THESL)
	<u>Policy Approver:</u> Policy Administration Steering Committee
	<u>Version Approval Date:</u> V8.0 2022-04-12
	<u>Last Reviewed by PASC:</u> V8.0 2022-04-12
The most recent version of this policy can be obtained from the Toronto Hydro intranet Plugged In at: http://pluggedin.torontohydro.com/policy/Pages/DistributionGridManagementPolicies.aspx	
The distribution of this policy is not restricted.	

A handwritten signature in black ink, appearing to read "Anthony Haines", written over a horizontal line.

Anthony Haines
President and CEO, Toronto Hydro Corporation

May 6, 2022

Date

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1 DOCUMENT REVIEW & REVISION HISTORY

This policy is reviewed annually.

Version Number	Date of Review	Reviewed By	Brief Description of Change
V1.0	2007-07-01	PASC	V1.0 approved by PASC.
V2.0	2009-10-23	PASC	V2.0 Approved outside of regular scheduled PASC meeting
V3.0	2013-04-25	PASC	V3.0 approved by PASC members
V.3.1	2013-12-09	PASC	V3.1 approved by PASC
V4.0	2015-06-09	PASC	Administrative Changes V4.0 approved by PASC
V5.0	2017-10-16	PASC	Administrative Changes. Additional changes to align with new THESL Signing Policy. Added standards section regarding conflicts with other corporate policies and tracking policy compliance.
V6.0	2018-10-22	PASC	Administrative Changes. Added clause to address procurement affecting real property. Additional changes to align with the THESL Signing Policy
V7.0	2020-05-26	PASC	Added new clause for Supplier References, added new exception for Contract term as it relates to real property, added new exception for Crisis and Emergency management. General clarifications.
V8.0	2022-04-12	PASC	-Added new clause for Procurement between THESL and Affiliates -Modified clause 7.4, Administrative Changes.

2 DISTRIBUTION HISTORY

Version Number	Date of Issue	Recipients
V1.0	2007-07-01	Toronto Hydro @ Home Employee Extranet
V2.0	2009-10-26	Toronto Hydro @ Home Employee Extranet
V3.0	2013-05-10	Toronto Hydro Intranet Plugged In at: http://pluggedin.torontohydro.com/policy/Pages/
V3.1	2013-12-09	Toronto Hydro Intranet Plugged In at: http://pluggedin.torontohydro.com/policy/Pages/
V4.0	2015-06-09	Toronto Hydro Intranet Plugged In at: http://pluggedin.torontohydro.com/policy/Pages/
V5.0	2017-10-16	Toronto Hydro Intranet Plugged In at: http://pluggedin.torontohydro.com/policy/Pages/
V6.0	2018-10-22	Toronto Hydro Intranet Plugged In at: http://pluggedin.torontohydro.com/policy/Pages/
V7.0	2020-05-26	Toronto Hydro Intranet Plugged In at: https://pluggedin.torontohydro.com/policy/Pages/allpolicies.aspx
V8.0	2022-04-12	Toronto Hydro Intranet Plugged In at: https://pluggedin.torontohydro.com/policy/Pages/allpolicies.aspx

3 POLICY OVERVIEW

This policy outlines the process that is to be followed for the procurement of any good or service by any of Toronto Hydro's corporate entities. The goals of this policy are to ensure Toronto Hydro business objectives are achieved and to facilitate compliance with applicable internal standards and requirements as well as regulatory, statutory and other legal requirements.

4 DEFINITIONS AND ABBREVIATIONS

<u>TERM or ACRONYM</u>	<u>DESCRIPTION</u>
Affiliate	An affiliate has the same meaning as in the Business Corporations Act (Ontario). THESL's affiliates are Toronto Hydro Corporation (THC), Toronto Hydro Energy Services Inc. (THESI), any other Subsidiary, the City of Toronto, and other City-owned entities (agencies, boards, commissions and corporations).
Authorization Level Document	The most recent version of the Authorization Level Document setting out expenditure levels for authorized persons.
Board	The Board of Directors of Toronto Hydro Corporation or of any Subsidiary as may be applicable.
Business Unit	The Toronto Hydro Corporation or Subsidiary department requesting a Procurement.
CEO	President and Chief Executive Officer of Toronto Hydro.
CIO	Customer Care & Chief Information Officer of THESL.

<u>TERM or ACRONYM</u>	<u>DESCRIPTION</u>
Contract	Contract means: <ul style="list-style-type: none"> (i) an agreement for the payment of monies, delivery of goods/services, or transfer, sale or lease of property, material or equipment; (ii) an agreement that relates to financing activities, capital management initiatives, the granting of liens or other secured arrangements; (iii) an easement or right-of-way; (iv) a release or settlement of claim; or (v) any other agreement or document that imposes binding obligations on the Corporation.
Confidential Information	All information and data of any nature relating to the business and operations of Toronto Hydro or any of its affiliates (as that term is defined in the Business Corporations Act (Ontario)), including without limitation, information or data that relates to prices, or forms of contracts, or is financial, technical, business, operational or marketing in nature, or relates to research, development, marketing plans, generating facilities, machinery, equipment configurations, generation, costs, customers, suppliers, formulae or terms of sale, whether factual or interpretive, in all cases whether in written, oral, visual, photographic, electronic, magnetic or other form, and whether or not identified verbally, visually or in writing as confidential.
Contract Amount	The total amount of expenditures required under any Contract, excluding HST and any other value added tax, and shall be determined by calculating the total amount of all possible expenditures over the term of the Contract, including all years of a multi-year term and all years of all possible Contract renewals, and shall include the potential maximum amount of all conditional, contingent and variable payments. Procurements shall not be artificially divided so as to constitute a Contract Amount below applicable threshold values. For Contracts to be signed by the CEO, the Contract Amount shall exclude the value of any optional Contract renewal years where this option is exercised at the Corporation's discretion.
Enterprise Connect	Toronto Hydro enterprise resourcing planning system.
Executives	The Executive Vice Presidents of Toronto Hydro or of any Subsidiary as may be applicable.

<u>TERM or ACRONYM</u>	<u>DESCRIPTION</u>
Personal Information	<p>Information about an identifiable individual that is in the possession of or under the control of Toronto Hydro, including: (a) information relating to race, national or ethnic origin, colour, religion, age, sex, sexual orientation, marital status, education, medical and employment history; (b) any identifying number, symbol, or other particular assigned to him or her; (c) his or her address or telephone number; (d) his or her name if it appears with other information about the individual or would reveal his or her Personal Information; and (e) his or her personal opinions or views except if they relate to another individual.</p> <p>Personal Information does not include an individual's business contact information or work product, nor does it include information that has been aggregated or de-identified, such that an individual's information cannot be identified.</p> <p>Personal Information does not include information that is maintained for the purpose of creating a record that is available to the general public.</p>
Procurement	<p>A purchase, agreement to purchase, licence, lease or rental of any good or service, including an agreement to purchase construction services.</p> <p>Includes any extension or renewal of any procurement or construction Contract made prior to the date of this policy.</p>
Procurement Policy	This Procurement Policy together with all forms and procedures referenced herein.
Senior Management	The Manager, Director, or General Manager of any Business Unit with responsibility for an approved budget for the Procurement in question.
Senior Management, IT	The Senior Management that is responsible for the operation of the Information Technology department.
Senior Management, Supply Chain Services	The Senior Management that is responsible for the operation of the Supply Chain Services.
Signing Policies	The most recent versions of the signing policies of Toronto Hydro as approved by the relevant Board of Directors.
Subsidiary	Toronto Hydro-Electric System Limited, Toronto Hydro Energy Services Inc. and any other direct or indirect subsidiary of Toronto Hydro Corporation, from time to time.
Supply Chain Services	The department responsible for all the Procurements within Toronto Hydro.
THESL	Toronto Hydro-Electric System Limited.
Toronto Hydro	Toronto Hydro Corporation and its Subsidiaries.

5 SCOPE

This policy applies to all Procurements made by Toronto Hydro except as otherwise authorized in writing by the Board or the CEO.

- 5.1 This policy is designed to augment other corporate policies and is not intended to replace or preclude them. Should an overlap arise between the application of this policy and any other policy, the policy most specific to the situation will apply.

6 OBJECTIVES

- 6.1 This policy is intended to assist in achieving Toronto Hydro's business objectives such as:
- Ensuring efficient Procurement at most favourable acquisition cost
 - Promoting the use of competition in selecting suppliers and contractors
 - Providing for the fair and equitable treatment of all suppliers and contractors
 - Providing safeguards for maintaining a Procurement system of quality and integrity
 - Ensuring suppliers meet or exceed Toronto Hydro's quality, safety and environmental requirements
 - Ensuring that all Procurement is made in compliance with all regulatory requirements and applicable laws

7 GENERAL PROCUREMENT RULES APPLICABLE TO ALL BUSINESS UNITS

Unless otherwise authorized in writing by the Board or the CEO:

- 7.1 All Procurement shall be administered by the Supply Chain Services. All Procurement shall be reviewed and approved by Senior Management, Supply Chain Services unless it meets conditions outlined in section 2 of the *Appendix A - Exceptions to General Procurement Rules*.
- 7.2 Other than the exceptions in *Appendix A - Exceptions to General Procurement Rules*, all Procurements shall be sourced via the *Procedure for Competitive Procurement*.
- 7.3 All approved Procurement shall be processed and documented in accordance with the *Procedure to Document Approved Procurement*.
- 7.4 All Procurement of information technology related goods or services (including computer equipment, software or related services) with a Contract Amount greater than \$25,000 USD or CAD must also be approved by the CIO or Senior Management, IT in writing. For all other Procurement of information technology related goods or services (including computer equipment, software or related services) Business Unit must consult with IT before Procurement.
- 7.5 The initial term for any Contract shall not exceed five (5) years, and any renewal term(s) shall not exceed a total of five (5) years unless it meets conditions outlined in section 8 of the *Appendix A - Exceptions to General Procurement Rules*.
- 7.6 The Senior Management, Supply Chain Services may at any time request that a particular Procurement be made through the *Procedure for Competitive Procurement*.
- 7.7 No current employee of Toronto Hydro shall communicate with a third party about a former or current supplier for purposes of providing reference/recommendation where such reference/recommendation could be in any way construed as a reference/recommendation made on behalf of Toronto Hydro or that directly relates to work performed by the supplier unless authorized in writing by Senior Management, Supply Chain Services.

8 PROCUREMENT BETWEEN THESL AND AFFILIATES

- 8.1 Any and all Procurement involving the provision or receipt of services, resources, products, or use of an asset between THESL and one or more Affiliates must comply with the Ontario Energy Board's Affiliate Relationships Code for Electricity Distributors and Transmitters. For greater clarity, this includes transactions subject to Appendix A - Exceptions to General Procurement Rules.
- 8.2 Supply Chain Services and/or Business Units shall be responsible for obtaining the appropriate regulatory and legal advice from the Director, Regulatory Applications & Business Support and Director, Business Law Services or their respective delegates.

9 OWNERSHIP, APPROVAL AND RESPONSIBILITIES

Policy Owner

- 9.1 This policy is owned by the Executive Vice-President Planning & Chief Engineering & Modernization Officer (THESL).
- 9.2 The Executive Vice-President Planning & Chief Engineering & Modernization Officer is responsible for:
- Ensuring that this policy is comprehensive, clear and current
 - Ensuring that this policy is implemented and communicated to the departments and staff that are impacted
 - Ensuring ongoing compliance with this policy
 - Reviewing this Policy annually and recommending any amendments for approval by the Administration Steering Committee

Policy Approver

- 9.3 This policy is approved by the Policy Administration Steering Committee.
- 9.4 The Policy Administration Steering Committee is responsible for:
- Considering the impact of the proposed policy to the identified risk
 - Reviewing and approving any proposed amendments or content extensions to this policy
 - Reviewing and approving this policy annually

Designated Responsible Person (DRP)

- 9.5 This policy is managed by the Senior Management, Supply Chain Services.
- 9.6 The Senior Management, Supply Chain Services is responsible for:
- Immediately communicating any exceptions or violations of this policy to the Executive Vice-President Planning & Chief Engineering & Modernization Officer.
 - Reviewing this policy annually and communicating any proposed amendments to the Executive Vice-President Planning & Chief Engineering & Modernization Officer.
 - Conducting quarterly reviews to ensure compliance with this policy

Staff

9.7 All Toronto Hydro employees, officers and directors are required to comply with this policy.

10 POLICY COMMUNICATION

10.1 Table below outlines how this policy changes will be communicated to Toronto Hydro

<u>TYPE OF COMMUNICATION</u>	<u>COMMUNICATION TRIGGER</u>	<u>PARTY RESPONSIBLE FOR POLICY COMMUNICATION</u>	<u>AUDIENCE</u>	<u>ACKNOWLEDGEMENT?</u>
E-mail	Minor policy Revision as per discretion of Executive Vice-President Planning & Chief Engineering & Modernization Officer.	Senior Management, Supply Chain Services	All Business Unit employees involved in any Procurement	No
Plugged In	Minor policy Revision as per discretion of Executive Vice-President Planning & Chief Engineering & Modernization Officer	Senior Management, Supply Chain Services	All Business Unit employees involved in any Procurement	No
Presentation	Significant policy Revision as per discretion of Executive Vice-President Planning & Chief Engineering & Modernization Officer	Senior Management, Supply Chain Services	All Business Unit employees involved in any Procurement	Quiz and Attestation

11 POLICY COMPLIANCE AND VIOLATIONS

11.1 Any employee who fails to comply with this policy is subject to disciplinary action up to and including dismissal.

11.2 Failure to comply with this policy will pose significant financial, operational, legal and regulatory risks to Toronto Hydro.

Compliance Monitoring

11.3 Senior Management, Supply Chain Services is responsible for tracking and collecting applicable data, measuring compliance and reporting in such format as may be required.

12 RELATED LAWS, REGULATIONS AND DOCUMENTATION

This policy shall be read and applied in conjunction with the Signing Policies, the Authorization Level Document, as well as the following documents and regulatory authorities:

- *Appendix A - Exceptions to General Procurement Rules*
- *Procedure for Competitive Procurement*
- *Competitive Procurement Request Form*
- *Competitive Procurement Evaluation Recommendation Form*
- *Sole Source Justification Form*
- *Extending Existing Contract Justification Form*
- *Procedure to Document Approved Procurement*
- *Non-Discretionary Providers List*
- *Contractor Pre-Qualification Application*
- *Ontario Energy Board Affiliate Relationships Code for Electricity Distributors and Transmitters*

PROCUREMENT POLICY
APPENDIX A – EXCEPTIONS TO GENERAL PROCUREMENT RULES

1	Petty Cash or Procurement Credit Card Purchases	Procurement Policy does not apply to the following items:	
		1.1	Procurement that is processed in accordance with the most recent version of the Petty Cash Policy.
		1.2	Procurement that is processed in accordance with the most recent version of the Procurement Card Policy.
2	Purchases Below \$25,000	Procurement that meets all of the following conditions may be sourced using procedures outlined in this section instead of the competitive procedures described in section 7.2 of the Procurement Policy or the sole source procedures described in section 4 of this document.	
		Conditions	
		2.1	Annual cumulative Contract Amount of the Procurement from a particular vendor is below \$25,000.00 USD or CAD.
		2.2	Procurement is not artificially divided so as to constitute a Contract Amount below \$25,000.00 USD or CAD.
		Procedures	
		2.3	If all of the above conditions have been met, an authorized person under the Authorization Level Document may approve such Procurement.
		2.4	It is strongly recommended to solicit at least 3 quotes from different suppliers to ensure competitive pricing.
		2.5	The Business Unit shall retain all documentation, including award justification, related to such Procurement for a review by the Supply Chain Services or Toronto Hydro's Internal Audit department or as otherwise directed by the Supply Chain Services on annual or as needed basis.
		2.6	Documentation shall be retained for no less than six years from the time of the Procurement and in accordance with Toronto Hydro's Records Management Policy.
3	Contract Value Adjustments	Procurement that meets all of the following conditions may be sourced using procedures outlined in this section instead of the competitive procedures described in section 7.2 of the Procurement Policy or the sole source procedures described in Section 4 of this document.	
		Conditions	
		3.1	Procurement represents an amendment to the original Contract Amount of an active, unexpired Contract.
		3.2	Cumulative value of all amendments is less than or equal to 10% of the original Contract Amount or is less than or equal to \$250,000.00, whichever is smaller.
		Procedures	
		3.3	If all of the above conditions have been met, Senior Management may in writing, at his/her discretion and in accordance with the Signing Policy, authorize such Procurement.
		3.4	The Business Unit shall retain all documentation related to such Procurement for a review by the Supply Chain Services

			Department or the Internal Audit Department or the Legal Services department or as otherwise directed by the Supply Chain Services Department on as needed basis.
		3.5	Documentation shall be retained for no less than six years from the time of the Procurement and in accordance with Toronto Hydro's Document Retention Policy.
4	Sole Source Procurement	Procurement that meets any of the following conditions may be sourced using procedures outlined in this section instead of the competitive procedures described in section 7.2 of the Procurement Policy.	
		Conditions	
		4.1	Procurement cannot be processed in accordance with section 7.2 of the Procurement Policy due to time constraints imposed by an unforeseeable situation or an emergency.
		4.2	Only one vendor is uniquely capable of providing goods or services.
		4.3	Procurement represents an amendment to the original Contract Amount above the threshold outlined in section 3.2 (of this document) or original term of an active, unexpired Contract.
		4.4	Procurement is related to a government or municipal agency that is not included in the <i>Non-Discretionary Providers List</i> .
		4.5	Competitive sourcing is currently in progress and goods or services are required for business continuation.
		4.6	Procurement is related to membership or donations.
		4.7	Goods or services required to support existing infrastructure, equipment, or system/applications and are either proprietary or are unavailable from any source except original supplier.
		4.8	Toronto Hydro is performing work on a property that can only be done by the lessor, owner, or their approved suppliers.
		4.9	Lease agreements.
		4.10	Procurement of goods or services for which Toronto Hydro will be fully reimbursed.
		Procedures	
		4.11	Business Unit shall submit a sole source purchase requisition in the Enterprise Connect (SAP) for the entire Contract Amount.
		4.12	Business Unit Executive shall review and authorize all sole source requisitions.
4.13	Business Unit must complete and submit a <i>Sole Source Justification Form</i> to the Supply Chain Services.		
4.14	Upon receiving a completed <i>Sole Source Justification Form</i> , the Supply Chain Services will conduct a due diligence review in connection with the sole source purchase request. The review will also determine if the sole source purchase is in the best interests of Toronto Hydro, and include a review of the proposed contract's specifications, scope, definition, commercial terms, liabilities, and insurance requirements.		
4.15	Senior Management, Supply Chain Services shall review and authorize all sole source requisitions.		

5	Procurements From Non-Discretionary Providers	Procurement that meets all of the following conditions may be sourced using procedures outlined in this section instead of the competitive procedures described in section 7.2 of the Procurement Policy or the sole source procedures described in Section 4 of this document.	
		Conditions	
		5.1	Supplier is listed on the <i>Non-Discretionary Providers List</i> .
		Procedures	
		5.2	An authorized person under the Authorization Level Document may approve such Procurement.
	5.3	This procurement may be paid via the non-order invoice.	
6	Extension of Existing Contracts	Procurement that meets any of the following conditions may be sourced using procedures outlined in this section instead of the competitive procedures described in section 7.2 of the Procurement Policy.	
		Conditions	
		6.1	Business Unit wishes to exercise its contractual right to extend an existing Procurement as set out in an existing contract.
		6.2	Contract has provisions for extensions.
		6.3	Contract Amount is not depleted.
		Procedures	
		6.4	Business Unit shall complete <i>Extending Existing Contract Justification Form</i> and submit it to Supply Chain Services.
6.5	Upon receiving a completed <i>Extending Existing Contract Justification Form</i> , the Supply Chain Services in consultation with Legal Services department will conduct a due diligence review of the extension request to determine if the current contract permits such an extension and whether such extension is in the best interests of Toronto Hydro, including a review of the proposed contract's specifications, scope, commercial terms, liabilities, and insurance requirements. Supply Chain Services will then process the request.		
7	Crisis / Emergency Management	Procurement that meets all of the following conditions may be sourced using procedures outlined in this section instead of the competitive procedures described in section 7.2 of the Procurement Policy or the sole source procedures described in Section 4 of this document.	
		Conditions	
		7.1	Declaration of crisis / emergency by the Grid Emergency Management, Executives, or CEO.
		Procedures	
7.2	If all of the above conditions have been met, Senior Management, Supply Chain Services may in writing, at his/her discretion and in accordance with the Authorization Level Document, authorize such Procurement.		

		7.3	Supply Chain Services shall retain all documentation, including award justification, related to such Procurement for a review by the Toronto Hydro's Internal Audit department on annual or as needed basis.
		7.4	Documentation shall be retained for no less than six years from the time of the Procurement and in accordance with Toronto Hydro's Records Management Policy.
8	Contract Term exemption	Procurement that meets all of the following conditions may have a longer Contract term than described in section 7.5 of the Procurement Policy.	
		Conditions	
		8.1	Procurement is related to Real Estate leasing agreement.
		Procedures	
		8.2	If all of the above conditions have been met, The Executive Vice President, Chief Customer Care, Electric Operations & Procurement Officer may in writing, at his/her discretion authorize such procurement.

Appendix B
Engagements Not Originating from a Competitive Procurement Process

Year	Supplier Name	Cost (\$M)	Summary of Nature of Transaction	Methodology used for Selection
2020	Anixter Power Solutions Canada	\$4,500,000	Purchase of submersible and vault transformers for business continuity and contingency management.	Sole Source
2020	Oracle Canada ULC	\$2,000,000	Purchase of proprietary license subscriptions and maintenance.	Sole Source
2020	SAP Canada Inc.	\$1,600,000	Purchase of SAP licence products for system capability expansion.	Sole Source
2020	Bentley Canada Inc.	\$1,300,000	Purchase of support and maintenance services for Bentley MicroStation application.	Sole Source
2020	Dynatrace Corporation of Canada	\$1,245,000	Purchase of support services for suite of Dynatrace application monitoring products.	Sole Source
2021	Motorola Solutions Canada Inc.	\$1,802,000	Purchase of radio-based communication equipment upgrades.	Sole Source
2021	IBM Canada Ltd.	\$1,800,000	Purchase of support services for IBM software and maintenance products.	Sole Source
2022	SAP Canada Inc.	\$3,851,088	Purchase of maintenance and support for SAP software applications.	Sole Source
2022	Nokia Canada Inc.	\$1,200,000	Purchase of proprietary software used for capacity augmentation and maintenance.	Sole Source
2023	Trans Canada Forest Products	\$2,000,000	Purchase of treated wood poles for business continuity and contingency management.	Sole Source
2023	Dell Canada Inc.	\$4,600,000	Purchase of licences for a suite of Dell application storage products.	Sole Source

1 **WORKFORCE STAFFING AND COMPENSATION OVERVIEW**

2

3 Investments in human capital are a key component of the 2025-2029 investment plan, as
4 Toronto Hydro relies on having a highly-skilled and dedicated workforce to deliver the 38
5 capital and operations work programs in Exhibit 2B and Exhibit 4, Tab 2, respectively.
6 Without a sufficiently skilled and capable workforce, Toronto Hydro would face significant
7 risks in executing its plan and achieving performance outcomes that customers need and
8 value.¹ To prevent these consequences, the utility needs to increase its workforce capacity
9 by approximately 214 resources starting in 2024 through 2029.² On a Full Time Employee
10 (“FTE”) basis as outlined in Appendix 2-K, this increase amounts to roughly 25 percent of the
11 overall FTE complement.

12

13 In addition to the accelerated pace of investment that is required to sustain, modernize and
14 expand the grid for an electrified future, changes in technology, policy and customer
15 expectations are putting pressure on the workforce to be future-ready and capable with
16 enhanced skills to perform work in an increasingly fast-paced, complex and data-intensive
17 operating environment. Toronto Hydro’s workforce plan includes critical investments in
18 building advanced skills and capabilities needed to rise up to the challenge.

19

20 The evidence in this Exhibit 4, Tab 4 presents Toronto Hydro’s workforce needs, plans and
21 its compensation strategies and costs for the 2025-2029 rate period as follows:

- 22
- 23 • Schedule 1 – Overview
 - 24 • Schedule 2 – OEB Appendix 2-K (Employee Cost)
 - Schedule 3 – Staffing Strategy

¹ Please see Exhibit 1B, Tab 3, Schedule 2 for an overview of Toronto Hydro’s historical performance.

² The staffing plan is based on headcount needs and requirements over the filed period. Appendix 2-K presents the translation of the staffing plan to budgeted full time equivalents (FTEs).

- 1 • Schedule 4 – Compensation
- 2 • Schedule 5 – Mercer Benchmarking Report

3

4 **1. STAFFING PLAN AND CHALLENGES**

5 Toronto Hydro has a robust and engaged workforce that delivers valuable outcomes to the
6 company and its customers. The key tenets of Toronto Hydro’s workforce philosophy are:

7 **a) Talent Acquisition & Development:** Attract and recruit talent for the organization to
8 fill critical roles and achieve business objectives. Provide training and development
9 opportunities to help employees grow and acquire new skills, create career paths
10 and implement succession plans.

11 **b) Workforce Culture, Diversity and Inclusion:** Create a diverse and inclusive workplace
12 where everyone feels valued, supported and respected. Foster a growth mindset and
13 positive culture that promotes employee engagement, wellness and work-life
14 balance to maintain an engaged, innovative and high-performing workforce.

15 **c) Performance and Productivity:** Achieve objectives by setting clear expectations,
16 providing regular feedback, and recognizing and rewarding employees who meet or
17 exceed expectations. Embrace new technology and invest in tools and systems that
18 can improve efficiency, automate repetitive tasks, enhance the quality of work, and
19 promote collaboration across teams.

20 **d) Agility & Innovation:** Adapt to evolving business needs, emerging technologies, and
21 changing market conditions by leveraging data and analytics to monitor market
22 trends, measure performance, and make data-driven decisions.

23

24 **1.1 Needs and Challenges**

25 Over the last decade and throughout the current rate period, Toronto Hydro focused on
26 rebuilding and replenishing its workforce in the face of both familiar challenges (i.e.

1 retirements and attracting and retaining talent) and emerging challenges brought on COVID-
2 19 and other external factors affecting Toronto Hydro's business. During the pandemic,
3 Toronto Hydro's workforce numbers reached a historic low in 2021. Retirements that were
4 expected to be paced fairly evenly over the 2020-2025 rate period were instead
5 concentrated in years 2020 and 2021. At the same time, the pandemic temporarily
6 suspended talent acquisition, training, and development for critical areas and skill sets
7 established during the previous rate period. As a result, Toronto Hydro's plans to increase
8 its staffing levels over the 2020-2024 period were delayed.

9

10 Toronto Hydro proved its aptitude in addressing these challenges, with notable
11 achievements including:

- 12 • Over 100 trades and technical positions filled as of 2022;
- 13 • Average age of employees in 2022 was 40 – a 14% decrease over the last decade;
- 14 • 76% talent retention rate;
- 15 • 25% of roles filled by new graduates from colleges and universities;
- 16 • Continued focus on job harmonization with the Power Line Technician trade,
17 augmenting total harmonization from 51 non-management unionized jobs to 12; and
- 18 • 40% of roles filled from within to support career development, talent retention and
19 succession planning.
- 20 • Total recordable injury frequency improved by 43% from 2018 to 2022 leading to a
21 safer and more productive workforce;
- 22 • Consistently ranked as one of the Best Corporate Citizens in Canada by Corporate
23 Knights since 2018 (in 2022 placing 2nd overall and 1st in the category of Electricity
24 Transmission and Distribution) in recognition of responsible investments to achieve
25 social and environmental benefits for the customers of Toronto Hydro; and

- 1 • Received multiple awards, including: (i) recognition by Electricity Canada for
2 Leadership in External Collaboration and Partnerships, and the President’s Award of
3 Excellence for Employee Safety – Distribution, (ii) sustainability leader by Canada’s
4 2024 Clean50, in addition to earning a spot on Canada’s Clean16 list as a top
5 contributor in the category of Traditional Energy and (iii) Most Effective Recovery
6 Award from the Business Continuity Institute Americas recognizing Toronto Hydro’s
7 response to COVID-19 and its efforts to mobilize immediately to protect its workforce
8 and the public, while continuing to provide safe and reliable delivery of electricity
9 throughout the city of Toronto.

10

11 In addition to these achievements, the utility also expects to successfully implement its
12 resource plan over the current rate period by catching-up to the overall levels that were
13 forecasted in the 2020-2024 rate application.³ Yet fundamental shifts have taken place since
14 the last application that have material implications, and require responsive action over the
15 2025-2029 rate period. Customers, governments, and markets have started coalescing
16 around a need to accelerate the energy transition to mitigate the existential and economic
17 impacts of climate change. As customers electrify previously non-electric energy uses (e.g.
18 transportation and heating) and increase participation in clean energy production and
19 management, these actions will have fundamental long-term implications for Toronto Hydro
20 and its system. Because the external environment has changed, Toronto Hydro’s resource
21 catch-up efforts are also a foundational step towards a future-ready plan that includes
22 investments in resourcing capacity (headcount) and capabilities (enhanced skills) that are
23 necessary to meet the challenge ahead.

³ EB-2018-0165.

1 Toronto Hydro needs to expand its workforce by approximately 214 resources starting in
2 2024 through 2029 to meet the imperatives and objectives of its 2025-2029 investment plan.
3 These investments are necessary to both ensure adequate resourcing to support the safe
4 and efficient execution of planned work programs, and develop advanced capabilities to
5 advance outcomes that matter to customers and stakeholders, including a building a more
6 resilient and efficient grid for the future and enabling the city's economic growth and
7 electrification.⁴ Technological advancements and evolving customer expectations require
8 Toronto Hydro to accelerate digital transformation to keep up with the pace of change.
9 Attracting and developing employees with the skills and competencies to meet the technical
10 challenges and achieve the objectives of modernizing and expanding the grid is a critical
11 component of the utility's workforce strategy.

12

13 **1.2 Talent Development Strategy**

14 A strong talent attraction and engagement strategy is critical to: (i) continue to position
15 Toronto Hydro as an employer of choice; (ii) build staff competence to address
16 requirements, deliver plans, and integrate more technology and innovation into their work;
17 and (iii) advance leadership skills and competence to support diversity, equity and inclusion,
18 lead in a hybrid work environment and role model culture change.

19

20 Toronto Hydro takes a comprehensive, forward-looking approach to maximizing the value
21 of its existing employee resources by providing timely upskilling and training opportunities,
22 applying productivity strategies, supporting innovation, promoting from within the
23 organization, and using management tools to maximize employee performance. Toronto
24 Hydro relies on a combination of all these approaches to achieve organizational success and
25 meet its human resource requirements.

⁴ See Exhibits 2B, Section E and Exhibit 4, Tab 2.

1 While Toronto Hydro maximizes the value of its existing workforce, the utility is unable to
2 meet the needs and drivers of its staffing plan exclusively from hiring internally. To meet its
3 staffing needs through external recruits, Toronto Hydro employs a combination approach
4 that includes acquiring additional talent from the market, hiring new graduates, leveraging
5 its relationships with colleges and universities, and outsourcing work to third-party service
6 providers where appropriate.

7

8 **2. COMPENSATION STRATEGY**

9 Toronto Hydro's workforce is the means by which the utility delivers service and value to its
10 customers, carries out its objectives, and complies with its mandatory obligations. The utility
11 strives to secure and maintain a workforce that is highly skilled, agile, innovative, productive
12 and engaged. To achieve these key outcomes in a cost-effective manner, Toronto Hydro's
13 compensation strategy is to: (i) provide wages and benefits that are competitive in the
14 markets where Toronto Hydro competes for talent, and (ii) use a pay-for-performance model
15 to align the workforce with the utility's core objectives, set and manage high performance
16 expectations, foster productivity, and reward employees for their contributions to the
17 utility's performance. The effect of external pressures and shifting preferences of candidates
18 in a large and diverse urban city requires a strong market-competitive compensation
19 program to attract, retain and engage employees.

20

21 According to Mercer's Compensation Benchmarking study (the "Mercer Study") which can
22 be found at Exhibit 4, Tab 4, Schedule 5, Toronto Hydro's total compensation is positioned
23 within a market competitive range relative to the 50th percentile of the energy market. With
24 respect to the general industry peer group, total compensation is slightly above market due
25 to pensions and benefits, while the total cash component of compensation is within market

1 range. The Mercer Study affirms that Toronto Hydro’s compensation strategy continues to
2 yield good value for the utility and its customers.

3

4 The forecasted total compensation cost for 2029 is [REDACTED] million, which represents a
5 compound annual growth rate of [REDACTED] percent over the total compensation costs of \$211.1
6 million in 2020. For total cash compensation costs (i.e. base salary wages, overtime and
7 incentive payments) the average cost per full-time employee (“FTE”) is increasing by a
8 compound annual growth rate of [REDACTED] percent from 2020 to 2029.⁵ In preparing 2024 to 2029
9 total cash compensation forecasts and the various components of them, Toronto Hydro
10 considered, and the forecasts reflect, the following inputs: (i) Toronto Hydro’s obligations
11 under collective agreements, (ii) relevant labour market data (where available),⁶ and (iii) the
12 utility’s projections of outcomes of future rounds of collective bargaining that will take place
13 throughout the forecast period. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

18

19 **2.1 Compensation Philosophy for Non-Union Employees**

20 Toronto Hydro provides non-unionized employees with a total cash compensation package
21 comprised of two elements: base salary and variable performance pay. Base salary
22 compensates an employee for meeting the expectations related to their responsibilities,
23 accountabilities, and technical skills. Variable performance pay rewards employees for their

⁵ The average cost per employee is mathematically derived from the data in OEB Appendix 2-K; namely total compensation divided by total FTEs per year.

⁶ For example, the results of Mercer Canada’s August 2023 QuickPulse™ Canada Compensation Planning Survey show total salary increases of 3.7 percent: <https://www.imercer.com/ca/ARTICLEDETAIL/annual-increase-budget-canada>

1 contribution to achieving goals and objectives tied to the utility’s strategic pillars, in
2 combination with their successful demonstration of corporate competencies.

3

4 Each non-union position at Toronto Hydro has a salary grade with a corresponding salary
5 range. To maintain alignment with the competitive labour market, the utility adjusts salary
6 ranges based on annual market reviews.

7

8 Because Toronto Hydro operates in niche areas of expertise, both as part of the electricity
9 system and as a regulated entity, the utility hires capable workers but at a less experienced
10 level, and trains and develops them on the job. From 2019 to 2023 year-to-date, newly hired
11 employees were brought into their roles at an average of 87 percent of the salary grade. To
12 keep the workers that Toronto Hydro invests in training and developing on the job, the utility
13 progresses them through the salary ranges more quickly to reflect their upskilling and
14 acquired experience levels.

15

16 **2.2 Compensation Philosophy for Bargaining Unit Employees**

17 Over half of Toronto Hydro’s employees belong to collective bargaining units represented
18 by the Power Workers’ Union (“PWU”), the Society of United Professionals - Engineers
19 (“Society Engineers”), or the Society of United Professionals - IT (“Society IT”). Toronto
20 Hydro’s compensation costs with respect to these employees are negotiated through
21 periodic collective bargaining in accordance with the legal duty to bargain in good faith. The
22 utility has both contractual and statutory obligations to honour the terms of its collective
23 bargaining agreements.⁷

⁷ *Ontario Labour Relations Act*, 1995, S.O. 1995, c. 1, Sched. A, section 56.

1 The current collective agreement with PWU was effective as of February 1, 2022 and is valid
2 until January 31, 2027. The utility's current collective agreement with the Society Engineers
3 came into effect January 1, 2020 and is valid until December 31, 2023. The utility's current
4 collective agreement with Society IT came into effect January 1, 2021 and is valid until
5 December 31, 2025.

6

7 **2.3 Benefits and Pensions**

8 In order to remain competitive for talent, full-time employees are entitled to medical and
9 dental benefits, short- and long-term disability income protection, life insurance, and
10 accidental death and dismemberment insurance. Employees are also eligible to participate
11 in the Ontario Municipal Employees Retirement System pension plan and receive post-
12 retirement benefits. The cost of employee benefits is expected to increase from \$74.5
13 million in 2025 to █████ million in 2029.

14

15 To manage benefits costs, Toronto Hydro regularly negotiates with benefit providers and
16 conducts comprehensive vendor market reviews on a periodic basis. In 2021 Toronto Hydro
17 conducted a vendor market review for the Employee and Family Assistance Program
18 which resulted in the utility securing a new provider for employee mental health and overall
19 wellness at a reduced per member rate of approximately 30 percent.

1 **WORKFORCE STAFFING PLAN AND STRATEGY**

2

3 The 2025-2029 investment plan includes necessary investments in 38 distinct work
4 programs to address existing and emerging challenges that the utility faces in serving its
5 customers safely, reliably and efficiently in this decade and beyond as the city of Toronto
6 continues to grow amidst an energy transition that is creating an expanded role for
7 electricity across key sectors of the economy.

8

9 Toronto Hydro needs a robust, engaged and highly-skilled workforce to support execution
10 of planned capital and operations work programs outlined in Exhibits 2B and 4, Tab 2,
11 respectively. This schedule outlines Toronto Hydro's workforce philosophy and plans to
12 secure the resources and skill sets that the utility needs to: (i) deliver its work programs
13 safely, reliably and efficiently, and (ii) achieve the performance outcomes that customers
14 need and stakeholders value as outlined in Exhibit 1B, Tab 3, Schedules 1 and 2.

15

16 The evidence is organized as follows:

- 17 • Workforce Philosophy
- 18 • Workforce Drivers and Needs
- 19 • Workforce Breakdown by Segment
- 20 • Talent Development Strategy

21

22 **1. WORKFORCE PHILOSOPHY**

23 Demographic and post-pandemic societal shifts are reshaping the labour market in Canada,
24 at the same time that technology and digital innovation are redefining the skill sets and
25 strategies needed to ensure an agile, engaged and productive workforce. Toronto Hydro's
26 workforce philosophy is mindful and responsive to key changes in the labour market and

1 employee preferences. To maintain its competitive advantage in the evolving labour market
2 and remain an employer of choice, Toronto Hydro must invest in its greatest asset – its
3 people. These investments entail increases in the capacity of the workforce to maintain
4 employee wellness and avoid employee burnout through work-life balance (the right to
5 disconnect from work). Similarly, Toronto Hydro must invest in advanced skills and
6 capabilities to empower its workforce to excel in the face of rapid technological
7 advancement, and changing policy requirements and evolving customer expectations.

8

9 To build and maintain a robust, diverse, engaged and productive workforce, Toronto Hydro
10 relies on the following key tenets of its workforce philosophy:

11 a) **Talent Acquisition & Development:** Attract and recruit talent for the organization to
12 fill critical roles and achieve business objectives. Provide training and development
13 opportunities to help employees grow and acquire new skills, create career paths
14 and implement succession plans.

15 a) **Workforce Culture, Diversity and Inclusion:** Create a diverse and inclusive workplace
16 where everyone feels valued, supported and respected. Foster a growth mindset and
17 positive culture that promotes employee engagement, wellness and work-life
18 balance to maintain an engaged, innovative and high-performing workforce.

19 b) **Performance and Productivity:** Achieve objectives by setting clear expectations,
20 providing regular feedback, and recognizing and rewarding employees who meet or
21 exceed expectations. Embrace new technology and invest in tools and systems that
22 can improve efficiency, automate repetitive tasks, enhance the quality of work, and
23 promote collaboration across teams.

24 c) **Agility & Innovation:** Adapt to evolving business needs, emerging technologies, and
25 changing market conditions by leveraging data and analytics to monitor market
26 trends, measure performance, and make data-driven decisions.

1 **2. WORKFORCE DRIVERS AND NEEDS**

2 **2.1. Challenges**

3 Over the last decade and throughout the current rate period, Toronto Hydro focused on
4 rebuilding and replenishing its workforce in the face of both familiar and emerging
5 challenges. Familiar challenges for Toronto Hydro include renewing its workforce due to
6 retirements, attracting and retaining talent, and developing new entrants to its workforce
7 through partnerships with colleges and universities. For the last ten years, Toronto Hydro
8 has managed the workforce renewal challenge brought by the wave of baby-boomer
9 retirements.¹ After each retirement, the organization must deal with not only a loss of
10 knowledge and experience, but also a need to train and develop the individuals promoted
11 or newly hired. In addition to demographic-related challenges, Toronto Hydro employees
12 are often sought after by other organizations that may offer similar roles in neighbouring
13 geographic regions. A competitive labour market challenges the utility to maintain market
14 competitiveness of its compensation and benefits programs to attract and retain employees
15 to work in Toronto.

16

17 Although employment in the utilities sector has remained relatively stable, labour market
18 changes, including demographic shifts, increasing competition and strong demand for
19 workers with digital skills have led to shortages of workers trained in science, technology,
20 engineering and mathematics (STEM), as well as in digital skills.² Toronto is the largest city
21 in Canada and one of the fastest growing urban centers in North America and the demand
22 for qualified and knowledgeable STEM resources is strong, not only with the utilities sector
23 but among multiple sectors outside of the industry.

¹ The term “baby boomers” refers to those individuals that were born between 1947 and 1965.

² Mahboubi, Parisa. 2022. The Knowledge Gap: Canada Faces a Shortage in Digital and STEM Skills. Commentary 626. Toronto: C.D. Howe Institute: https://www.cdhowe.org/sites/default/files/2022-08/Commentary_626_0.pdf

1 Toronto Hydro also faced unprecedented challenges posed by the COVID-19 pandemic and
2 consequent impacts. During the pandemic, Toronto Hydro's workforce numbers reached a
3 historic low in 2021. Retirements that were expected to be paced fairly evenly over the 2020-
4 2025 rate period were instead concentrated in years 2020 and 2021. At the same time, the
5 pandemic temporarily suspended talent acquisition, training, and development for critical
6 areas and skill sets established during the previous rate period. As a result, Toronto Hydro's
7 plans to increase its staffing levels over the 2020-2024 period were delayed, particularly as
8 it relates to the Power Line Technician trade hiring plan. The rapidly changing business
9 environment and social distancing requirements impacting hiring for positions requiring in-
10 person training contributed to this unavoidable hiring delay.

11

12 Toronto Hydro successfully weathered the challenges of remote work and of addressing
13 increased safety risks, with a comprehensive infectious disease response plan. At the outset
14 of the COVID-19 pandemic, Toronto Hydro mobilized immediately to protect its workforce
15 and the public while continuing to provide safe and reliable delivery of power throughout
16 the city of Toronto. The plan established protocols required to manage an infectious
17 communicable disease outbreak to maintain the health and safety of employees and
18 mitigate the spread of infectious disease through the workforce. Toronto Hydro did not
19 experience any workplace transmission of COVID-19 through 2022. In recognition of its
20 response to COVID-19, Toronto Hydro received the Most Effective Recovery Award from the
21 Business Continuity Institute (BCI) Americas. The BCI, a global organization of business
22 continuity and resilience professionals representing more than 100 countries worldwide,
23 gives this award to an organization that was significantly impacted by an incident or crisis,
24 but managed to recover and demonstrate resilience.

1 The COVID-19 pandemic significantly impacted traditional talent management approaches
2 and introduced a new level of complexity in recruiting talent. Changing attitudes towards
3 commuting to the workplace and the overall concern of extended commute times in the City
4 of Toronto added a new layer of challenge and complexity to the utility's attraction and
5 retention efforts.³ The utility addressed this through flexible work policies that are
6 responsive to changing preferences. Specifically, in 2022, Toronto Hydro transitioned to a
7 hybrid work arrangement that enables employees who can perform their work from home
8 with the flexibility to attend their assigned work center a minimum number of days a week
9 and work remotely the other days. Reintegrating the workforce into the office and building
10 a hybrid work culture where employees feel engaged was a notable challenge that Toronto
11 Hydro worked hard to overcome over the last two years. It succeeded by adopting work
12 policies and practices that were informed by employee feedback, and implemented
13 incrementally with a focus on the unique needs of each operational area. This was
14 complemented by a gradual increase in in-person employee engagement, which helped
15 ensure the successful adoption of the new hybrid work model throughout the organization.

16

17 Once the acute challenges of the pandemic began to subside, customers, governments, and
18 markets started coalescing around a need to accelerate the energy transition to mitigate the
19 existential and economic impacts of climate change. As customers electrify previously non-
20 electric energy uses (e.g. transportation, heating) and increase participation in clean energy
21 production and management, these actions will have fundamental long-term implications

³ In 2022, Mercer conducted the Flexible Working Policies and Practices Survey across Canada, polling employers and employees on offerings and preferences for onsite, hybrid and fully remote working arrangements. The survey indicated that 53% of employers offered and 53% of employees wanted hybrid working arrangements.
<https://www.imercer.com/ca/products/flexible-working-policies-practices-survey-ca>

1 for Toronto Hydro and its system, including—but not limited to—being ready to serve a
2 future demand for electricity that is expected to roughly double over the next two decades.⁴

3 Given its fundamental obligation to connect customers who want to access the distribution
4 grid, Toronto Hydro cannot enter this period of significant change unprepared to handle
5 increased demand and consumption, bi-directional power flows, increased societal reliance
6 on electricity, and enhanced customer expectations that naturally flow from these
7 evolutions. As with investments in Toronto Hydro’s grid, human capital investments require
8 a long lead-time to develop and safely train. Depending on the trade, for example, it takes
9 anywhere from four and half to six and a half years to train a new certified and skilled trades
10 person, plus a minimum additional one to two years to develop a new front-line leader post
11 apprenticeship. Due to the long lead time required for investment in both grid and human
12 capital, to meet these needs Toronto Hydro must begin work today to be prepared for an
13 accelerated energy transition in the next decade.

14 **2.2. Capacity**

15 As the operating conditions affected by COVID-19 pandemic stabilized in 2022, Toronto
16 Hydro started increasing the pace of its recruitment to ‘catch-up’ to its projected staffing
17 levels by the end of 2023. Yet, because the external environment has changed, these catch-
18 up efforts are also a foundational step towards a future-ready plan that includes investments
19 in resourcing capacity (headcount) and capabilities (enhanced skills) that are necessary to
20 meet the challenge ahead.

21 Toronto Hydro needs to expand its workforce by approximately 214 resources starting in
22 2024 through 2029 to meet the imperatives and objectives of its 2025-2029 investment

⁴ As shown in Future Energy Scenarios report filed as Exhibit 2B, Section D4, Appendices A and B.

1 plan.⁵ These investments are necessary to: (i) ensure adequate resourcing to support the
2 safe and efficient execution of planned work programs outlined in Exhibits 2B, Section E and
3 Exhibit 4, Tab 2, and (ii) develop advanced capabilities to advance outcomes that matter to
4 customers and stakeholders, including a building a more resilient and efficient grid for the
5 future and enabling the city’s economic growth and electrification.

6

7 Toronto Hydro’s workforce requirements have been optimized by a decade and half journey
8 of productivity. This includes harmonizing jobs to create a more efficient and agile
9 workforce, outsourcing certain functions and aspect of work to focus on critical
10 competencies and skills, and automating repetitive manual processes to provide more
11 efficient service. These efforts produced a demonstrably lean workforce, enabling Toronto
12 Hydro to tackle the staffing needs and challenges ahead from a position of strength.⁶

13

14 After more than a decade of realizing sustained efficiencies while managing complex
15 operations with a flat headcount, it is no longer possible nor prudent for Toronto Hydro to
16 meet its obligations without additional resources. As the utility takes “least regrets” actions
17 to expand and modernize the grid to be ready and equipped for a once-in-a century
18 transformation of the energy system, it similarly needs to invest in an expanded resource
19 pool with new and enhanced skill sets to get the work done safely and cost-effectively.

20

21 Section 3 below provides an overview of the different segments of Toronto Hydro workforce
22 and explains the capacity investments that Toronto Hydro intends to make over the coming
23 years to meet the challenges ahead. The Designated and Technical Professionals segment
24 will see the largest number of resources added with the addition of approximately 250

⁵ The staffing plan is based on headcount needs and requirements over the filed period. Appendix 2-K presents the translation of the staffing plan to budgeted full time equivalents (FTEs).

⁶ Please see Exhibit 4, Tab 1, Schedule 1 at section 2.

1 resources over the 2023-2029 period. Workers in this segment will support not only a
2 growing capital program, but will also provide new needed capabilities related to
3 technology, advanced data analytics and other digital skills.

4

5 **2.3. Capabilities**

6 Technological advancements and evolving customer expectations require Toronto Hydro to
7 accelerate digital transformation to keep up with the pace of change. With increasing
8 technology on the grid (e.g. Advanced Distribution Management System (ADMS), Advanced
9 Metering Infrastructure (AMI), sensors and other field monitoring technologies) comes a
10 significant increase in the volume of data generated in the field. To effectively leverage this
11 data and gain valuable insights that can be used for improved planning and optimized
12 decision-making, Toronto Hydro needs to hire and develop resources with expertise in
13 advanced data analytics, statistical modelling, data science and machine learning
14 techniques.

15

16 Toronto Hydro must prepare to respond by attracting and developing employees with the
17 skills and competencies to meet the technical challenges and achieve the objectives of
18 modernizing and expanding the grid. For example, the Control Centre requires the support
19 of a team of technical staff whose duties include work scheduling, design review, system
20 analysis, energy management, reporting, and maintenance/development of core operating
21 technology platforms and tools (e.g. SCADA, Energy Centre, Network Management System,
22 etc.) Over the next several years, Toronto Hydro expects a significant increase in workload
23 associated with these functions to support increased distribution system automation, the
24 development and sustainment of energy management functions, distribution system growth
25 (load and connection volumes), and the expansion of the SCADA system to enable more

1 remote and autonomous operational capabilities. See Exhibit 4, Tab 2, Schedule 7 – Control
2 Centre Operations.

3

4 By employing and cultivating resources with advanced digital skills and capabilities, the
5 utility can gain a much more comprehensive understanding of grid performance, identify
6 anomalies, and optimize various aspects of grid operations. Data analysts empowered with
7 the right technology tools can develop models and algorithms that enable predictive
8 maintenance, load forecasting and demand response optimization. They can also uncover
9 hidden relationships between variables to improve grid stability, enhance asset
10 management strategies, and enhance outage management processes. The ability to extract
11 actionable insights from vast amounts of grid data can enable Toronto Hydro to make better
12 decisions and deliver enhanced value to customers. For example, with the implementation
13 of AMI2.0 Toronto Hydro can perform advanced analytics on meter-level outage data to
14 better understand reliability performance at the customer level, and optimize investments
15 to enable a more resilient and efficient grid for the future.

16

17 Building advanced capabilities to leverage technology and advanced data analytics to
18 improve existing systems and processes is a critical component of the utility's workforce
19 strategy. To upskill its existing workforce, Toronto Hydro is taking the following actions:

- 20
- 21 • **Providing Opportunities for Skills Development:** The utility proactively identifies
22 resourcing requirements and provides internal resources with opportunities for skills
23 development. Multiple methods have been used to achieve successful outcomes
24 including: (1) continuing education at post secondary institutions and certification
25 programs, (2) experiential learning opportunities through secondments, stretch
26 assignments and involvement on project teams, and (3) formal job-specific training
on technical and soft skills. The organization's performance management system

1 encourages leaders to have regular meetings with employees to understand
2 individual learning goals and structured development plans with milestones and
3 objectives.

- 4 • **Developing and Delivering Training Programs:** As new and future skill requirements
5 are identified, the utility develops and aligns training programs with specific learning
6 goals and outcomes and delivers them to its workforce. Training develops
7 transferable skills and increases the employee's capacity to learn. Training is
8 supported with confirmation of learning and skills transfer in the field and
9 inspections conducted by front line leaders. This ensures that the workforce
10 knowledge has increased sufficiently to safely and efficiently apply the new skill in
11 practice. Upskilling equips employees with the skills needed now and for the future,
12 supports career progression and is a strategy that supports retention.
- 13 • **Maintaining Safe Ratios of Supervision and Mentorship:** Toronto Hydro conducts
14 sophisticated long-term workforce staffing planning within its Certified and Skilled
15 Trades and Designated and Technical Professional positions to maintain the
16 workforce's competencies. This ensures that the learning and development
17 opportunities afforded to apprentices remain safe as a result of Toronto Hydro
18 established ratios of supervision and mentorship.

19

20 Toronto Hydro must invest in building a workforce with expanded skills in data analytics,
21 data science and big data who can leverage technology solutions such as artificial
22 intelligence (AI) software and other tools to manage and analyze large datasets towards the
23 following types of objectives.

- 24 1. Respond to risks posed by potentially disrupting technologies to the distribution
25 system. Grid modernization involves the integration of numerous digital
26 technologies. Ensuring robust cybersecurity measures is of paramount importance.

1 To address this evolving threat landscape, there is a need to prioritize and augment
2 capabilities and implement comprehensive strategies, such as conducting regular
3 security audits, and deploying advanced monitoring systems. The utility must assess
4 the security posture of grid components, such as smart meters, ADMS systems, and
5 communication networks. Specialized knowledge is required to recommend
6 appropriate security controls and measures. The addition of resources to support
7 cybersecurity risk and threat management ensures the resilience and reliability of
8 the grid system as it undergoes modernization efforts.

9 2. Design, operate and manage an automated and bi-directional grid that is capable of
10 connecting and integrating higher volume of distributed energy resources (DERs).
11 DER integration professionals collaborate with stakeholders including regulators,
12 DER providers, and customers to develop standardized interconnection processes,
13 address technical challenges, and streamline grid operations. With employees
14 knowledgeable in DER integration, it is easier to unlock the full potential of DERs,
15 maximize grid efficiency, and accelerate the transition to a clean and decentralized
16 energy future. The utility must also invest in training activities to enhance the
17 knowledge and capabilities of its Certified and Skilled Trades segment to safely plan
18 and operate within an automated and bi-directional grid. This will enable Toronto
19 Hydro to effectively manage grid variability, enhance resiliency, and optimize asset
20 utilization.

21 3. Building the utility's capacity and capability to provide proactive information and
22 service to drive improvements to customer experience, outcomes and interaction
23 with the grid. Toronto Hydro is working to meet customers' evolving expectations of
24 the utility. For example, as EV ownership increases and as more customers adopt
25 DERs, Toronto Hydro anticipates an increase in customer inquiries related to these
26 technologies, including topics such as service upgrades, connections, pricing plans

1 for EV charging and net metering and associated billing for DERs. The utility is looking
 2 to enhance the capabilities of its customer service representatives to ensure that
 3 Toronto Hydro is prepared to respond to customer needs in time for the energy
 4 transition.⁷

5 4. Building the utility’s capacity and capability to respond effectively to fast-evolving
 6 regulatory policy developments, challenges and opportunities in the current business
 7 environment. The utility has extensive legal, regulatory and communication needs
 8 served by highly-trained legal, regulatory and communications professionals. This
 9 team’s capacity and capabilities need to be enhanced in order to keep up with the
 10 volume and complexity of work necessary to support the utility’s work program
 11 which is shaped by electrification, the energy transition, new technologies and
 12 evolving customer choice. Drivers of this increase include an increase in contract
 13 volumes, claims volumes, agreements associated with large transit projects, and
 14 legal, compliance and policy work responsive to changes in the energy sector.

15
 16 Table 1 below provides a summary of the skills sets and sample jobs where the utility is
 17 investing to build the workforce of the future.

18

19 **Table 1: Skill Sets and Job Types for the Future Workforce**

Skill Sets	Job Types	Approximate Proportion of Staffing Plan
“Big Data” Analytics – Consolidation & Presentation of data to support Decision Making	Analysts – cross functional	23%

⁷ Cross-references to 4A Customer Care program

Skill Sets	Job Types	Approximate Proportion of Staffing Plan
Design, operational and management of distribution grid	Power Line Technician, Engineering Technologist, Power System Controller, Meter Mechanic, Meter Data Technologist, Distribution System Technologist, Dispatcher	17%
Front-line Leadership	Day-to-day operations and people management	16%
Financial management, regulatory affairs management, legal management, supply chain management, operations support, human resources management	Professional & supporting skills – cross functional	16%
Distribution system design and engineering to support existing and new technologies (e.g. bi-directional grid, distributed energy resources)	Engineers	11%
Customer Experience, Key Account Management, Customer Relations Management	Large Customer & Key Account Consultant Customer Relations Representative	10%
New technical and cyber security skills to support technology advancements and innovation	IT Technical Consultant Cyber Security Specialist	7%
TOTAL		100%

1

2 **3. WORKFORCE BREAKDOWN BY SEGMENT**

3 Toronto Hydro has a robust workforce of highly-skilled employees across diverse areas of
 4 expertise. Figure 1 shows the current and future composition of the projected workforce, by
 5 segment, out the end of the decade. The skills of employees and type of work executed
 6 within each segment is discussed in detail below.

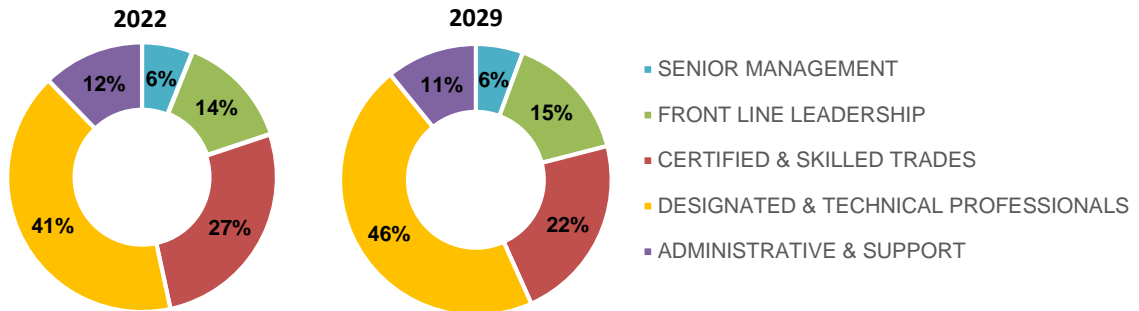


Figure 1: Projected Toronto Hydro Workforce Segments (2022 & 2029)

1 **3.1. Certified and Skilled Trades Segment**

2 Certified and Skilled Trades are responsible for executing the work required to construct and
 3 maintain the distribution system infrastructure, and for responding to trouble calls and
 4 emergency situations to restore power or address asset deficiencies or other circumstances
 5 that pose safety, environmental or reliability risks. Certified and Skilled Trades comprised
 6 approximately 27 percent of Toronto Hydro’s workforce as of the end of 2022. Although this
 7 segment is anticipated to decrease slightly as a percent of the total population of employees
 8 because of practical limitations of safely absorbing new certified and skilled trades into the
 9 organization (i.e. maintaining the appropriate apprentice to qualified journeyman ratios),
 10 Certified and Skilled Trades are expected to grow by approximately 40 resources by 2029 to
 11 replenish the workforce in this segment.

12
 13 Below is a detailed list of the positions and associated responsibilities within this segment.

- 14 • **Certified Meter Mechanic/Tester (“CMMT”)**: Installs, changes, removes, repairs,
 15 inspects, tests and calibrates of all types of meters and metering equipment for
 16 correct wiring and accuracy of metering, operation of meter test equipment
 17 according to documented procedures and to troubleshoot faults in meters.

- 1 • **Distribution System Technologist (“DST”)**: In 2009, job harmonization merged six
2 classifications into the new classification of Distribution System Technologist (DST).
3 The DST operates, installs, commissions, constructs, repairs, maintains, and
4 decommissions all types of substation equipment, protective relay and control
5 systems, station metering, distribution automation equipment, and SCADA systems,
6 including completion of all associated work orders, specifications, engineering
7 drawings, reports, and work procedures.
- 8 • **Power Line Technician (“PLT”)**: Constructs, operates, maintains and repairs
9 overhead and underground electrical and distribution systems. Erects and maintains
10 steel, wood, fiberglass, laminate and concrete poles, structures, and other related
11 hardware. The PLT installs, maintains and repairs overhead and underground
12 apparatus, and other associated equipment, such as insulators, cable, conductors,
13 lightening arrestors, switches, metering systems, transformers and lighting and
14 control systems. Splices and terminates cable and conductors to connect power
15 distribution and transmission networks. Previously, this work had been performed
16 by two distinct trades groups, the Certified Power Cable Person (“CPCP”) and
17 Certified Power Line Person (“CPLP”). Similar to the approach used in prior years as
18 part of the collective bargaining process, in 2022, these two roles were harmonized
19 into the Toronto Hydro Power Line Technician role. Graduates of the PLT
20 Apprenticeship program will be competent to work safely on any aspect of the
21 overhead or underground distribution system for both capital construction as well as
22 reactive or emergency scenarios. This will provide Toronto Hydro with significantly
23 greater flexibility in crew assignments and execution of work.
- 24 • **Power System Controller (“PSC”)**: Operates the electrical distribution system to
25 provide safe, reliable, and cost-effective delivery of electrical power on a rotating

1 24/7, 365 days/year shift schedule. Develops, directs, and dispatches system
2 switching, work protection, and trouble response for planned and emergency events.
3



PLT - Underground Plant



PLT - Overhead Plant

Figure 2: PLT Employees at Work

4 **3.2. Designated and Technical Professionals**

5 Designated and Technical Professionals are responsible for planning, designing and
6 executing work programs and for ensuring the utility’s compliance with legal, regulatory,
7 financial, and environmental requirements, applicable standards and best practices.⁸ This
8 segment comprised approximately 41 percent of Toronto Hydro’s workforce as of the end
9 of 2022, and is anticipated to grow to 46 percent with the addition of approximately 250
10 resources over the 2023-2029 period. The increase is driven by a multitude of factors
11 including: (i) responding to more complex legal and regulatory requirements such as related
12 to integration of Distribute Energy Resources (“DER”), (ii) operating in a more data-intensive

⁸ For example, Toronto Hydro must ensure compliance with environment, health and safety requirements including the Utility Work Protection Code, Electrical Utility Safety Rules, *Occupational Health & Safety Act* and Regulations, ISO 14001:2015 and ISO 45001:2018 standards, and the *Environmental Protection Act*. See Exhibit 4, Tab 2, Schedule 17 – Human Resources, Environment and Safety for further details.

1 environment driven by technology and modernization, and (iii) supporting an increase
2 volume of capital and operating programs over the period. All of these factors, and many
3 others that are detailed throughout the programmatic evidence in Exhibit 4, Tab 2 translate
4 to a corresponding increase in talent for the following positions and associated
5 responsibilities within this segment:

- 6 • **Engineers:** Participates in short- and long-range strategic asset planning to ensure
7 technical soundness, reliability, cost effectiveness, and safety for the utility; prepares
8 engineering reports and studies; performs engineering analysis and evaluations;
9 provides timely technical support/consultation, project management, and testing;
10 develops proposals and plans; and prepares and/or reviews methods, procedures
11 (process re-engineering), and designs. Engineers are accountable, and legally
12 responsible, for personal engineering work product (e.g. drawings, calculations,
13 documents, and the work of others which the engineer has signed).
- 14 • **Engineering Technologists:** Supports the formulation of electric system plans and
15 co-ordinates system operation services with the control centre; develops distribution
16 plans by calculating load forecasts; prepares conceptual and detailed designs and
17 cost estimates for projects related to system expansion, rehabilitation, and
18 maintenance of the electrical and civil infrastructure; conducts studies, prepares
19 reports, makes recommendations relating to station and system distribution load
20 forecasts, engineering studies, technical standards, utility materials, tools, and
21 construction practices; and prepares, reviews, and maintains project schedules.
- 22 • **Analysts:** Enable the utility to make data driven decisions, provide valuable insights
23 and satisfy a variety of external obligations and internal responsibilities. As systems
24 evolve and are added and more data is produced, roles are required to analyze and
25 integrate various data sets. Analysts in both corporate and operational areas require
26 critical thinking, creativity, and problem-solving techniques to define needs and

1 recommend solutions that deliver value to stakeholders. Analysts employ a variety
 2 of tools, including: predictive analysis to elevate the customer experience; numerical
 3 skills to measure and statistically analyze large data sets; technical skills to
 4 understand business problems, organize and present data.

5

6 Without the required staffing levels of Designated and Technical professionals, Toronto
 7 Hydro would not have the necessary resources to plan and design a safe, secure and reliable
 8 distribution system in compliance with legislative and regulatory requirements, applicable
 9 standards and best practices. As shown in Figure 3 below, the capacity of this segment tracks
 10 closely with the overall size of the capital investment plan as measured by expenditures.

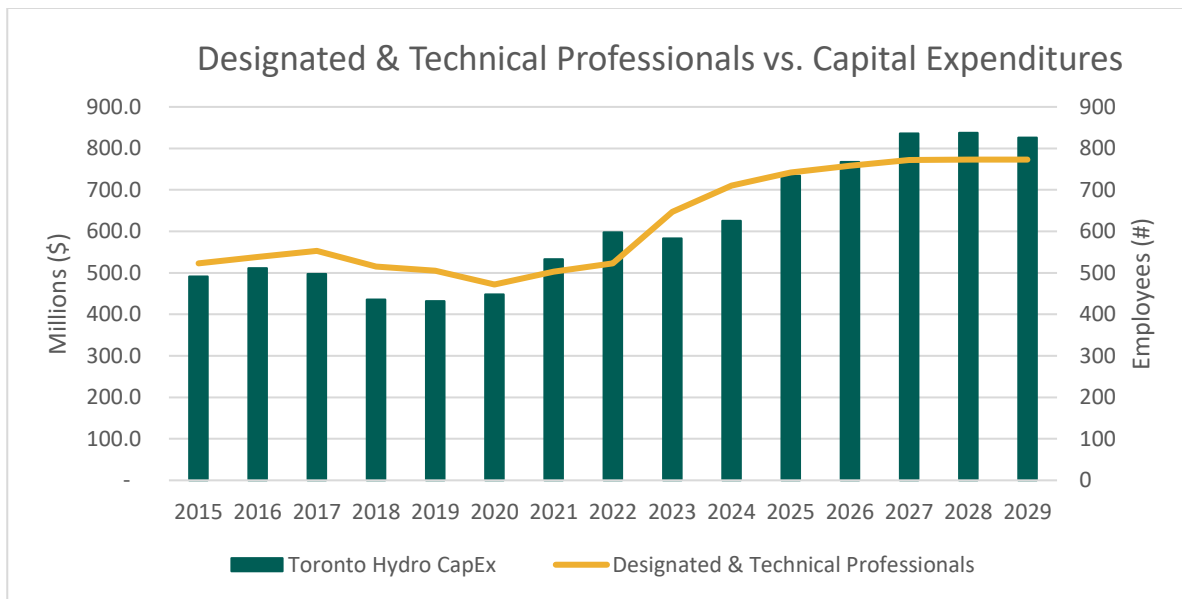


Figure 3: Designated & Technical Professionals Compared to Capital Expenditures

11

12 In addition to keeping up with increasing work volumes, the employees in this segment are
 13 tasked with designing and planning for changes to how customers use electricity and how
 14 the utility operates the grid brought by technological advancements and necessitated by

1 customer demands in an electrified future. This includes grid automation technologies to
2 enhance system observability and controllability and to enable the gradual transition to a
3 two-way power flow grid that provides customer greater choice over their electricity
4 consumption, and the opportunity to participate in the system by selling electricity back to
5 the grid.

6

7 Last but not least, the resources in this segment are an important source of internal talent
8 for front line and senior management leadership roles. Investments in this segment produce
9 proprietary industry knowledge and expertise that Toronto Hydro relies on to fulfill
10 leadership roles efficiently and effectively through internal recruitments. In 2022, 46 percent
11 of internally filled leadership roles (front line and senior management) were from the
12 Designated and Technical professionals' segment.

13

14 **3.3. Front Line Leadership**

15 Front Line Leadership positions are responsible for managing and overseeing the complex
16 design and execution of the utility's capital and operations work plans. The responsibilities
17 associated with these positions include safety training, inspections, audits, investigations,
18 risk management, problem-solving, staff training and development, performance
19 management, employee engagement, coaching and mentoring.

20

21 Front Line Leadership employees are primarily trained, developed and promoted from
22 within the organization to leverage their in-depth experience and track-record of high-
23 performance at the utility. At the end of 2022, this segment comprised approximately 14
24 percent of Toronto Hydro's workforce. Over the 2025-2029 rate period, this segment must
25 remain stable in order to oversee the delivery of the utility's work programs and ensure that
26 internal and external resources work in a safe, productive and environmentally responsible

1 manner. To maintain its proportion to the overall compliment, the segment is expected to
2 grow by approximately 80 resources from 2023-2029. Without sufficient resources in Front-
3 Line Leadership positions, Toronto Hydro's track-record of productivity and performance
4 would be compromised.⁹

5

6 **3.4. Operational Support & Administration**

7 Operational Support & Administration staff enable the efficient execution of work within
8 operations, customer care and corporate functions. This segment provides administrative
9 support to function specific management and technology systems, creates and maintains
10 professionally formatted business documentation and makes recommendations to
11 streamline and improve the administration, coordination and delivery of processes within
12 the assigned business unit. Employees within this work segment are continuously reskilling
13 and upskilling to take on higher-value work such as reporting, research and analysis tasks.

14

15 At the end of 2022, this segment comprised approximately 12 percent of Toronto Hydro's
16 workforce. Efforts throughout the 2017 to 2022 period to streamline processes resulted in
17 an 18 percent decrease in the number of employees in this segment. Furthermore, as a result
18 of investments in upskilling these employees, operational support and administration staff
19 have become a valuable pipeline for development and career progression in the
20 organization. From 2020 to 2022, 25 percent of internal professional and certified and skilled
21 trades recruitment was filled by employees from this segment.

22

23 This segment needs to remain stable through 2029 to support the efficient execution of
24 work, to attract new labour market entrants to the organization, and provide a pipeline for

⁹ See Exhibit 1B, Tab 3, Schedules 2 and 3 for more information about the utility's performance and productivity track-record.

1 other workforce segments. Without appropriate staffing levels in these positions, Toronto
2 Hydro would not only risk a reduction in productivity as a result of higher cost resources
3 having to perform process-focused administrative work, but would also lose the opportunity
4 to develop a critical source of internal talent. The number of resources is expected to
5 increase by approximately 30 over the 2023-2029 period.

6

7 **3.5. Senior Management**

8 Senior Management positions provide the leadership and strategic guidance necessary to
9 achieve Toronto Hydro's objectives in a complex, highly-specialized and regulated
10 environment. Senior Management leaders hold extensive portfolios of accountabilities that
11 are responsive to dynamic systems, processes and technologies. These accountabilities are
12 evolving as result of changes in the external environment including changing customer
13 expectations with respect to reliability and resilience, technological advancement and
14 emerging public policy imperatives to modernize and prepare Toronto Hydro's grid and
15 operations for electrification.

16

17 Through well-developed processes for identifying and developing leadership potential,
18 Toronto Hydro has successfully improved leadership bench strength and created a pool of
19 qualified and talented employees to fill critical Senior Management positions. From 2020-
20 2022, 93 percent of senior management roles were filled internally, with limited reliance on
21 the external market to fill increasingly senior leadership roles. On average over the period,
22 these roles filled approximately 60 percent faster than externally filled positions, positively
23 impacting operational efficiency and productivity.

24

25 As of the end of 2022, this segment comprised approximately 6 percent of the workforce.
26 Over the next rate period, Toronto Hydro needs to maintain the proportion of resources in

1 this segment stable in order to manage and lead the organization to achieve its core
2 objective and rise up to the challenge of serving higher customer demand and expectations
3 for safe, reliable and cost-effective power in an electrified future. The segment is expected
4 to increase by approximately 20 resource over 2023-2029.

5

6 **4. TALENT DEVELOPMENT STRATEGY**

7 A strong talent attraction and engagement strategy is critical to: (i) continue to position
8 Toronto Hydro as an employer of choice; (ii) build staff competence to address
9 requirements, deliver plans, and integrate more technology and innovation into their work;
10 and (iii) advance leadership skills and competence to support diversity, equity and inclusion,
11 lead in a hybrid work environment and role model culture change. This section will outline
12 how the utility will develop existing resources and execute an effective internal and external
13 hiring strategy.

14

15 **4.1. Existing Resources**

16 Toronto Hydro takes a comprehensive, forward-looking approach to maximizing the value
17 of its existing employee resources by providing timely upskilling and training opportunities,
18 applying productivity strategies, supporting innovation, promoting from within the
19 organization, and using management tools to maximize employee performance. Each of
20 these approaches is discussed in detail below. Toronto Hydro relies on a combination of all
21 these approaches to achieve organizational success and meet its human resource
22 requirements.

23

24 **4.1.1. Upskilling and Training Opportunities**

25 Toronto Hydro provides employees with extensive training and upskilling opportunities.
26 These opportunities serve several purposes. They ensure that employees within each

1 workforce segment have the requisite knowledge and skills required to perform their jobs
2 competently, safely and in compliance with the relevant rules, codes and authorities. They
3 also serve to enhance awareness of equity, diversity and inclusion issues in the organization,
4 equip employees with the capabilities to meet emerging technology challenges, and prepare
5 the right talent for promotion from within.

6

7 Toronto Hydro delivered nearly 550 training and development programs from 2020 to 2022.
8 These programs are tailored to the work requirements of different positions across the
9 organization. For example, within the Certified and Skilled Trades segment, Toronto Hydro
10 is focused on providing training through a trade school that maintains safe apprentice-
11 journeyman ratios and equips workers with the competence to execute work efficiently
12 and safely on electrified assets within Toronto Hydro's dense urban service territory.
13 Toronto Hydro periodically updates the content and form of this training to reflect current
14 best practices and deliver it in an effective manner.

15

16 Over the current rate period, Toronto Hydro transitioned 29 of its training programs from
17 being led by instructors in-person to being delivered virtually. This conversion will eliminate
18 the need for employees to travel to a training location, reducing vehicle emissions and
19 increasing the number of trainees who can attend a given class session.

20

21 Toronto Hydro also delivers upskilling opportunities to its employees across all segments to
22 enhance their technical and professional abilities and improve operational capabilities to
23 address emerging business needs and challenges posed by technological advancement. For
24 example, after the implementation of the new SAP system in 2018, Toronto Hydro created
25 a group of highly-trained and skilled employees, called Enterprisers, to enable and assist SAP
26 users through the company to unlock the full functionality of the new system.

1 Over the 2025-2029 rate period, Toronto Hydro intends to develop and enhance data
2 analytics capabilities as a critical skill given increased data generated from new technologies
3 (e.g. AMI 2.0). Toronto Hydro is continuing to develop in-house training that focuses on
4 building employees' future-ready skills including fluency with data analysis programs such
5 as Tableau to perform sophisticated research using modern software tools. These
6 investments in upskilling the workforce are critical to developing advanced operational
7 capabilities to intelligently manage a more complex and highly-utilized energy system.

8

9 Toronto Hydro is also incorporating emerging technologies in its upskilling. A Virtual Reality
10 (VR) training module was introduced in 2022 for crew members that focuses on Pad-
11 Mounted Switchgear operations and repair. The VR training is designed to provide crews
12 with a realistic, interactive simulation that covers everything from inspecting the job site for
13 hazards to safely repairing and operating the switchgear being exposed to the many hazards
14 associated with performing this task in the field. VR training also facilitates real-time
15 assessments and data collection.

16

17 Finally, Toronto Hydro provides education opportunities focused on building the
18 competence of all employees on the value of diversity, equity and inclusion, the
19 identification and understanding of unconscious bias, and the importance of inclusive
20 leadership. 91 percent of leaders in the organization completed unconscious bias training in
21 2022.

1 **Table 2: Training and Development Programs (2020-2022)**

Area	2020 Courses	2021 Courses	2022 Courses
Compliance (e.g. Environmental and Safety legislative training, EUSA and ESA Rules, Confined Space, Work Protection Code, Network Switching)	52	49	51
Legislative (e.g. WHMIS, Defensive Driving, Forklift Training)	48	48	51
Apprentice (e.g. Distribution Systems Technologist, Power Systems Controllers, Certified Power Cable Persons, Certified Power Line Persons, Meter Mechanics)	20	20	27
Leadership (e.g. Safety Leadership, Performance Management, Management Control & Reporting System, Project Management, Policy Administration)	5	4	15
Technical & Customer Service (e.g. Engineering Technicians, Electrical Awareness, Project Execution, Customer Education Training)	54	51	53
Total	179	172	197

2

3 Investments in the development and upskilling of talent offers many benefits for the utility,
 4 including creating a valuable pipeline for fulfilling vacancies internally and leveraging career
 5 progression as a retention strategy. Front line operational support and administrative staff
 6 are a prime example of this strategy at work. From 2020 to 2022, approximately 25 percent
 7 of internal professional and certified and skilled trades recruitment was filled by employees
 8 from this segment.

9

10 **4.1.2. Promotion from Within**

11 Promotion from within the organization is a key tenet of Toronto Hydro’s talent
 12 management strategy. The utility has built an internal pipeline to develop employees’ skills,

1 experience and abilities. Developing new leaders and upskilling current employees with the
2 potential to grow is crucial to future success. Establishing a pipeline allows Toronto Hydro
3 to identify, develop and place the right talent in critical roles throughout the organization.
4 Internal candidates have a strong knowledge of Toronto Hydro's culture and management
5 systems. This knowledge is a strategic asset that the utility capitalizes on through its
6 succession planning. Effective succession planning is an important tool for engaging,
7 developing, and retaining employees.

8

9 Toronto Hydro successfully executes this strategy to fill positions in its Designated and
10 Technical Professional, Certified and Skilled Trades, Front Line Leadership and Senior
11 Management segments. Between 2020 and 2022, approximately 40 percent of vacancies
12 were filled internally, 28 percent of which were internal promotions to more senior roles.
13 Leadership roles are predominately developed and promoted from within the organization
14 to realize the full benefits of investments made in employee upskilling and development,
15 and retain their in-depth experience and track-record of high-performance at the utility.
16 From 2020-2022, approximately 93 percent of senior management roles were filled
17 internally.

18

19 **4.1.3. Employee Performance**

20 Toronto Hydro uses a performance-based management and compensation system to set
21 expectations for employees, provide feedback, and recognize employees who meet and
22 exceed expectations. The individual component of the performance management system is
23 administered through annual performance contracts and biannual performance reviews.
24 The utility often sees over 90 percent compliance with its performance management system,
25 showcasing the timely utilization of setting goals and evaluating employees based on their

1 achievements. For management employees, performance pay is directly related to the
2 achievement of both individual and organizational objectives.

3 **4.2. External Hiring**

4 While Toronto Hydro maximizes the value of its existing workforce, the utility is unable to
5 meet the needs and drivers of its staffing plan exclusively from hiring internally. To meet its
6 staffing needs through external recruits, Toronto Hydro employs a combination approach
7 that includes acquiring additional talent from the market, hiring new graduates, leveraging
8 its relationships with colleges and universities, and outsourcing work to third-party service
9 providers where appropriate. Each of these strategies is discussed in detail below.

10

11 **4.2.1. Acquiring Additional Talent from the Market**

12 Toronto Hydro strategically recruits talent from the external market in the Greater Toronto
13 Area from both the general and energy industries and monitors market trends such as cost
14 of living pressures on an ongoing basis to adapt to changing conditions. The utility's external
15 recruitment process allows it to draw from a larger supply of diverse candidates and hire
16 specific skills that are not readily available within the organization. In addition, external
17 recruitment is key to expanding the workforce's capacity to execute Toronto Hydro's 2025-
18 2029 investment plan.

19

20 **4.2.2. Hiring New Graduates**

21 The complexity of Toronto Hydro's distribution system and dynamic operating conditions
22 mean that it is optimal for the utility to supplement its hiring of skilled external resources in
23 the market with hiring new graduates, particularly for its Certified and Skilled Trades
24 positions where skills are not readily available in the marketplace. This hiring pipeline relies
25 on the utility's training and apprenticeship programs to instill the specialized skills and

1 knowledge that are required to operate the distribution system reliably and safely. In
2 addition, this hiring strategy allows Toronto Hydro to develop and maintain a dependable
3 workforce that is capable of servicing the utility's operational needs well into the future. The
4 volume of hiring through this hiring pipeline is driven by safety requirements for training on
5 electrical apparatus that limit the number of apprentices who can be trained by a given
6 volume of field crews.

7

8 Depending on the trade, it takes anywhere from four and half to six and a half years to train
9 a new certified and skilled trades person, plus a minimum additional one to two years to
10 develop a new front-line leader post apprenticeship. The development period for certified
11 and skilled trades considers both operational and legislative requirements. Operational
12 requirements include relevant rules, policies, procedures, construction standards and
13 equipment to build knowledge, skills and expertise to safely operate the distribution system.
14 Legislative requirements incorporate standard knowledge and skills set out by governing
15 bodies such as the Ministry of Labour, Immigration, Training and Skills, the Ministries of
16 Environment and Transportation, the Technical Safety Standards Authority and the Electrical
17 Safety Authority. Toronto Hydro's apprenticeship program is comprehensive in that
18 incorporates technical trades training, best practices for the design and delivery of hands-
19 on operational and compliance training and rigorous testing at each phase of the
20 apprenticeship to confirm milestones are met.

21

22 Over a decade ago, Toronto Hydro adopted minimum qualifications for post-secondary
23 education in an electrical field of study for all entry level certified and skilled trades and
24 designated technical professional roles. The organization continues to evolve minimum
25 entry level qualifications across operational and corporate business areas and requires that
26 new hires have a university or college diploma in a related field of study. Toronto Hydro has

1 elected to prescribe this requirement as post secondary students enrolled in formal learning
2 programs are well-prepared for the workforce with future ready knowledge, skills and
3 abilities - namely, enhanced problem-solving skills, increased ability to analyze and think
4 critically, communication and comprehension aptitudes, and heightened initiative and
5 resourcefulness. This strategy has proven successful for Toronto Hydro and the quality of
6 instruction and work integrated learning programs provided through post secondary
7 education allows for both a ready talent pool for the organization and an accelerated
8 transition to the organization.

9

10 **4.2.3. Colleges and Universities**

11 Toronto Hydro continues to collaborate with colleges and universities to develop new
12 curricula and explore interdisciplinary learning opportunities that enable the availability of
13 short- and long-term workforce requirements. The utility offers valuable work experience to
14 post secondary students across Canada through well established work integrated learning
15 (WIL) opportunities that enable postsecondary students to apply the academic knowledge
16 gained through studies to a practical work environment.

17

18 Investments in experiential learning have resulted in 20 percent of former co-op students
19 finding employment at Toronto Hydro after graduation. To develop a pipeline of talent
20 situated within the utility's geographic service territory and to mitigate risks of talent loss to
21 neighbouring comparators, in 2020, Toronto Hydro partnered with George Brown College to
22 influence curriculum on a new three-year Electromechanical Engineering Technology –
23 Power and Control Diploma Program. Collaborations with institutions such as George Brown
24 College, Georgian College and Toronto Metropolitan University support academic programs
25 aligned to entry level qualifications for Certified and Skilled Trades and Designated and

1 Technical professionals and advance skill sets prior to entry for incoming talent. Such
2 collaborations are valuable because they allow Toronto Hydro to:

- 3 • influence and shape the programs and curricula, including diversity, equity and
4 inclusion to better match the utility’s strategic goals and long-term needs;
- 5 • spread awareness about the utility’s career prospects and human resource
6 requirements;
- 7 • build recruitment relationships with future graduates; and
- 8 • help bridge the gap and remove barriers to the labour market for newcomers to the
9 labour market.

10

11 Toronto Hydro’s commitment to hiring apprentices requires careful planning and
12 coordination to enable efficient and effective execution. Apprenticeships can be as long as
13 six and a half years where apprentices spend time in class as well as embedded with crews
14 to practice and refine skills in real world conditions. Hiring and training needs to be done
15 proactively so that apprentices have sufficient time to complete their programs, with
16 journeyperson oversight and mentoring, before becoming fully qualified to augment
17 resourcing levels and productively contribute to program outcomes. To minimize the total
18 cost of the apprenticeship process, recruits are typically hired in cohorts of between four
19 and eight resources at a time. From a talent attraction perspective, aligning recruitment
20 activities with post-secondary graduation cycles ensures the utility access to the broadest
21 range of qualified applicants to fill available opportunities.

22

23 **4.2.4. Outsourcing**

24 Toronto Hydro relies on third-party service providers to enable the utility to resource in
25 times of peak demand, maintain flexibility in operations, and gain access to specialized
26 expertise and knowledge. Outsourcing decisions are continually reviewed to determine if

1 operational requirements and other business drivers have changed the demand for
2 outsourced services. Outsourced services may be reintegrated to internal utility operations
3 to improve outcomes and retain critical and complex knowledge. This is evidenced during
4 the current rate period in that a complement of additional resources in the areas of
5 customer care, supply chain, and fleet operations were brought in house to augment
6 internal capabilities and maintain effective business operations.^{10,11,12}

¹⁰ Exhibit 4, Tab 2, Section 16.

¹¹ Exhibit 4, Tab 2, Section 15.

¹² Exhibit 4, Tab 2, Section 13.

1 **COMPENSATION STRATEGY AND WORKFORCE GOVERNANCE**

2

3 This schedule discusses Toronto Hydro’s compensation strategy and workforce
 4 governance practices. Further to the information outlined in OEB Appendix 2-K (Employee
 5 Costs/Compensation Table) at Exhibit 4, Tab 4, Schedule 2, this schedule provides an
 6 overview of: 1) Compensation Costs Overview; 2) Compensation Strategy and Workforce
 7 Governance; 3) Compensation Practices for Non-Union Employees; 4) Compensation
 8 Practices for Bargaining Unit Employees; and 5) Benefits and Pensions.

9

10 **1. COMPENSATION COSTS OVERVIEW**

11 Tables 1 and 2 below summarize Toronto Hydro’s total compensation costs for the
 12 current 2020-2024 and the future 2025-2029 rate periods, respectively.

13

14 **Table 1: 2020-2024 Total Compensation (\$ Millions)**

	2020 Actual	2021 Actual	2022 Actual	2023 Bridge	2024 Bridge
Management (including executive)	22.0	21.5	22.5	27.0	██████
Non-Management (union and non-union)	189.1	177.8	184.9	205.9	██████
Total Compensation	211.1	199.3	207.5	232.8	██████

Please note the numbers may not sum due to rounding.

1 **Table 2: 2025-2029 Total Compensation (\$ Millions)**

Year	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast
Management (including executive)	[REDACTED]				
Non-Management (union and non-union)	[REDACTED]				
Total Compensation	[REDACTED]				

Please note the numbers may not sum due to rounding.

2

3 Underpinning the utility’s compensation costs is a compensation strategy that balances
 4 cost-effectiveness with the need to attract and retain the talent required to provide
 5 service in an increasingly complex and dynamic operating environment. According to
 6 Mercer’s Compensation Benchmarking study (the “Mercer Study”) which can be found at
 7 Exhibit 4, Tab 4, Schedule 5, Toronto Hydro’s total compensation is positioned within a
 8 market competitive range relative to the 50th percentile of the energy market. With
 9 respect to the general industry peer group, total compensation is slightly above market
 10 due to pensions and benefits, while the total cash component of compensation is within
 11 market range. The Mercer Study affirms that Toronto Hydro’s compensation strategy
 12 continues to yield good value for the utility and its customers.

13

14 Over the 2024-2029 period, Toronto Hydro expects to increase its workforce capacity by
 15 approximately 25 percent compared to 2023 levels in order to address the challenges and
 16 requirements of sustaining the grid, modernizing the utility and preparing the system for
 17 the unprecedented energy transition that is set to take place in the next decade and
 18 beyond. In addition to increasing resourcing capacity to support the execution of its
 19 capital and operations work programs, the utility is investing in attracting and upskilling
 20 employees. This includes developing advanced capabilities to integrate more technology
 21 and data analytics into the grid and operations to drive continuous improvement in

1 system performance and optimize planning and decision-making. Toronto Hydro’s ability
2 to recruit, attract and retain talent in key areas of its operations has led to improvements
3 in safety, customer service, reliability, and productivity over the last 10 years as detailed
4 in Exhibit 1B, Tab 3, Schedules 2 and 3.

5

6 To implement Toronto Hydro’s workforce plan as summarized in Exhibit 4, Tab 1,
7 Schedule 1 and detailed in Exhibit 4, Tab 4, Schedule 3 as well as the programmatic
8 evidence in Exhibit 4, Tab 2, the forecast total compensation cost for 2029 is [REDACTED]
9 million, which represents a compound annual growth rate of [REDACTED] percent over the total
10 compensation costs of \$211.1 million in 2020. These figures include total cash
11 compensation costs (i.e. base salary wages, overtime and incentive payments) which are
12 increasing by a compound annual growth rate of [REDACTED] percent from 2020 to 2029 on the
13 basis of average cost per full-time employee (“FTE”).¹ In preparing 2024 to 2029 total cash
14 compensation forecasts and the various components of them, Toronto Hydro considered,
15 and the forecasts reflect, the following inputs: (i) Toronto Hydro’s obligations under
16 collective agreements, (ii) relevant labour market data (where available),² and (iii) the
17 utility’s projections of outcomes of future rounds of collective bargaining that will take
18 place throughout the forecast period. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

24

¹ The average cost per employee is mathematically derived from the data in OEB Appendix 2-K; namely total compensation divided by total FTEs per year.
² For example, the results of Mercer Canada’s August 2023 QuickPulse™ Canada Compensation Planning Survey show total salary increases of 3.7 percent: <<https://www.imercer.com/ca/ARTICLEDETAIL/annual-increase-budget-canada>>.

1 **2. COMPENSATION STRATEGY AND WORKFORCE GOVERNANCE**

2 Toronto Hydro's workforce is the means by which the utility delivers service and value to
3 its customers, carries out its objectives, and complies with its mandatory obligations. The
4 utility strives to secure and maintain a workforce that is highly skilled, agile, innovative,
5 productive and engaged. To achieve these key outcomes in a cost-effective manner,
6 Toronto Hydro's compensation strategy is to: (i) provide wages and benefits that are
7 competitive in the markets where Toronto Hydro competes for talent and (ii) use a pay-
8 for-performance model to align the workforce with the utility's core objectives, set and
9 manage high performance expectations, foster productivity, and reward employees for
10 their contributions to the utility's performance.

11

12 **2.1 Market-Competitiveness**

13 The utility must maintain the ability to attract, motivate, and retain employees who have
14 the knowledge, skills, and abilities that are critical to the utility's success in meeting
15 customer expectations and delivering customer outcomes. Toronto Hydro's
16 compensation strategy aims to strike an appropriate balance between controlling costs
17 and providing market-competitive compensation. In doing so, the utility examines the
18 reasonableness and effectiveness of its compensation program in alignment with industry
19 peers and relevant labour markets.

20

21 The effect of external pressures and shifting candidate preferences regarding work
22 arrangements (i.e. remote vs. in-office) in a large and diverse urban city requires a strong
23 market-competitive compensation program to attract, retain and engage employees.
24 Toronto is the largest city in Canada and continues to be a competitive labour market.
25 Emerging skill sets are in high demand with low supply across many other industries and

1 utilities.³ Due to the uniqueness, complexity and dynamic operating conditions of Toronto
2 Hydro's distribution plant, and competition in the labour market, it is challenging for
3 Toronto Hydro to attract and retain skilled employees.

4

5 Moreover, the COVID-19 pandemic significantly impacted traditional approaches to
6 talent management. According to the 2022 Canada Flexible Working Policies and
7 Practices Survey conducted by Mercer, 53 percent of employees want hybrid work
8 arrangements and 53 percent of employers offer a hybrid model.⁴ To remain market
9 competitive, Toronto Hydro introduced a hybrid work model.

10

11 Toronto Hydro reviews the market-competitiveness of its compensation packages for
12 non-union employees as part of its annual business planning and budgeting process. This
13 can include participating in compensation salary surveys offered through independent
14 consulting firms that specialize in the compilation of aggregate compensation data. The
15 data from these surveys gives Toronto Hydro an ability to compare its jobs relative to
16 other comparable jobs in both the energy and general industry in order to calibrate
17 compensation.

18

19 In addition to annual reviews in the normal course of business, the utility periodically
20 conducts external benchmarking studies to ensure that the level, form, and mix of
21 compensation offered by Toronto Hydro is competitive with those provided for
22 comparable jobs in the markets where the utility competes for talent. In 2022, Toronto
23 Hydro engaged industry-expert Mercer Canada to undertake a detailed compensation

³ Mahboubi, Parisa. 2022. The Knowledge Gap: Canada Faces a Shortage in Digital and STEM Skills. Commentary 626. Toronto: C.D. Howe Institute: <https://www.cdhowe.org/sites/default/files/2022-08/Commentary_626_0.pdf>.

⁴ Mahboubi, P. (n.d.). (rep.). *Canada Flexible Working Policies and Practices Survey*. Mercer: <<https://www.imercer.com/ca/products/flexible-working-policies-practices-survey-ca>>.


1 and benefits benchmarking study which can be found at Exhibit 4, Tab 4, Schedule 5 (the
 2 “Mercer Study”).

3
 4 The Mercer Study indicates that Toronto Hydro’s total compensation is positioned within
 5 a market competitive range relative to the 50th percentile of the energy market. With
 6 respect to the general industry peer group, total compensation is slightly above market
 7 due to pensions and benefits, while the total cash component of compensation is market-
 8 competitive. Mercer defines “market-competitive” as “within 10 percent of the target
 9 market positioning on a position-by-position basis.”⁵





10
 11 **2.2 Performance-Based Compensation**

12 Toronto Hydro compensates employees based on performance, which is assessed by the
 13 competencies demonstrated and outcomes achieved in the course of employment. This
 14 performance-based compensation strategy plays a central role in delivering the utility’s
 15 core objectives under the five corporate pillars described below in Table 3.

16
 17 **Table 3: Toronto Hydro’s Corporate Pillars**

Corporate Pillar	Core Objectives
 CUSTOMER	<ul style="list-style-type: none"> • Make it easy for customers to interact and transact with us • Provide value added and efficient services through various channels • Proactive and data-driven response to all customer segments • Utilize technology and analytics to meet customer’s information needs

⁵ Exhibit 4, Tab 4, Schedule 5 – Mercer Benchmarking Report at page 5.

Corporate Pillar	Core Objectives
 <p>PEOPLE</p>	<ul style="list-style-type: none"> • Ensure a healthy and safe work environment • Enhance diversity, equity and inclusion in the workplace • Optimize processes and invest in employee capabilities • Engage employees through purposeful work
 <p>ENVIRONMENT</p>	<ul style="list-style-type: none"> • Advance as a Sustainable Electricity Company • Reduce our environmental footprint • Enable our customers as a sustainability partner • Leverage environmental management system to achieve net zero by 2040
 <p>OPERATIONS</p>	<ul style="list-style-type: none"> • Keep the lights on • Keep our system safe • Build a grid that supports a modern city • Provide value to customers
 <p>FINANCIAL</p>	<ul style="list-style-type: none"> • Provide a fair return to our Shareholder • Continue to increase Shareholder value • Strive for strong and stable credit rating

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9

As further detailed in Exhibit 1B, Tab 3, Schedules 1 and 2, over the last decade, Toronto Hydro’s pay-for-performance model enabled the utility to achieve improvements in service quality and other performance outcomes such as:

- 60 percent improvement in employee safety record,
- 29 percent improvement in outages due defective equipment,
- 14 percent improvement in first contact resolution performance,
- 9 percent improvement to new services connected on time.

1 In addition to assessing employee performance based on the workforce competencies
 2 outlined in Table 4 below, Toronto Hydro’s performance-based compensation strategy
 3 includes individual, divisional, and corporate performance expectations that align with
 4 the utility’s core objectives. Performance expectations are set, assessed and reviewed
 5 through Toronto Hydro’s performance management system.

6

7 **Table 4: Toronto Hydro’s Workforce Competencies and Descriptors**

Workforce Competencies	Descriptors
Drives Results & Accountability	Has a clear sense of corporate direction and expectations, and holds self and others accountable to achieve objectives.
Demonstrates Customer-Focus	Models a customer-focussed approach in all decisions and actions.
Builds Strong Relationships	Builds valuable relationships across the organization and externally to support the future of Toronto Hydro.
Develops People and a Diverse & Inclusive Culture	Recognizes personal development and a strong organizational culture as integral components of an effective organization supporting diversity, equity and inclusion.
Champions Change, Productivity & Innovation	Prioritizes in innovation, continuous improvement, and productivity as essential drivers of long-term sustainability.
Demonstrates Commitment to Environment, Health & Safety	Manages risks to protect the health and safety of employees and the public, and shows a commitment to sustainability.

8

9 Toronto Hydro’s corporate competencies guide the following aspects of human resources
 10 management:

- 11 • **Recruitment and Selection:** Toronto Hydro uses its corporate competencies to
 12 develop the recruitment process for a particular position and takes the
 13 competencies into consideration as part of its selection criteria.
- 14 • **Training and Development:** The corporate competencies underpin the utility’s
 15 training initiatives. For example, if Toronto Hydro uses its performance
 16 management process to determine that an individual or team lacks customer

1 focus competencies, the utility would perform an assessment of training needs.
2 Based on the results, the utility would implement an appropriate customer
3 awareness training program to assist in closing this gap.

- 4 • **Performance Management and Compensation:** The corporate competencies are
5 integrated with Toronto Hydro's compensation practices. For non-union
6 employees, this occurs through the assignment of performance ratings, which
7 evaluate employees' performance in relation to the corporate competencies. The
8 performance rating is one of the components that determine base salary
9 increases. For unionized employees, Toronto Hydro uses performance
10 assessments tied to corporate competencies to determine base step increases for
11 employees with a solid performance rating who are not at the top of the defined
12 salary range.
- 13 • **Succession Planning and Promotion:** Decisions on succession planning and
14 promotion focus on developing employees who consistently meet the corporate
15 competencies, as indicated by their annual performance ratings.

17 **3. COMPENSATION PRACTICES FOR NON-UNION EMPLOYEES**

18 Toronto Hydro provides non-unionized employees with a total cash compensation
19 package comprised of two elements: base salary and variable performance pay. Base
20 salary compensates an employee for meeting the expectations related to their
21 responsibilities, accountabilities, and technical skills. Variable performance pay rewards
22 employees for their contribution to achieving goals and objectives tied to the utility's
23 strategic pillars, in combination with their successful demonstration of corporate
24 competencies.

1 Each non-union position at Toronto Hydro has a salary grade with a corresponding salary
2 range. To maintain alignment with the competitive labour market, the utility adjusts
3 salary ranges based on annual market reviews. Because Toronto Hydro operates in niche
4 areas of expertise, both as part of the electricity system and in the general industry, the
5 utility hires capable workers but at a less experienced level, and trains and develops them
6 on the job. From 2019 to 2023 year to date, newly hired non-union employees were
7 brought into their roles at an average of 88 percent of the salary grade. To keep the
8 workers that Toronto Hydro invests in training and developing on the job, the utility
9 progresses them through the salary ranges more quickly to reflect their upskilling and
10 acquired experience levels. This progression is based on merit increases.

11

12 The variable performance pay program is an incentive performance-based compensation
13 tool designed to retain, motivate, and reward employees for achieving performance
14 objectives, which are established at the beginning of each calendar year and documented
15 in an annual performance contract. Each employee's variable performance pay is based
16 on a weighting of performance objectives, which are measured by key metrics and by
17 individual goals set out in the employee's annual performance contract.

18

19 **4. COMPENSATION PRACTICES FOR BARGAINING UNIT EMPLOYEES**

20 Over half of Toronto Hydro's employees belong to collective bargaining units represented
21 by the Power Workers' Union ("PWU"), the Society of United Professionals - Engineers
22 ("Society Engineers"), or the Society of United Professionals - IT ("Society IT"). Toronto
23 Hydro's compensation costs with respect to these employees are negotiated through
24 periodic collective bargaining in accordance with the legal duty to bargain in good faith.

1 The utility has both contractual and statutory obligations to honour the terms of its
2 collective bargaining agreements.⁶

3

4 Toronto Hydro's bargaining interests are focused on supporting the organization's ability
5 to safely execute capital and operational programs in an efficient and cost-effective
6 manner while preserving management's rights to manage and direct the workforce. To
7 achieve negotiated settlements that are fair and reasonable for its employees, while
8 continuing to provide efficient service to its customers, the utility monitors and considers
9 external compensation data, bargaining trends and past settlements.

10

11 **4.1 PWU Collective Agreement**

12 Table 5 below summarizes the year-over-year general wage increases for PWU under the
13 previous and current collective agreement. The current collective agreement with PWU
14 effective as of February 1, 2022 and until January 31, 2027, resulted in a 2.6 percent
15 average general wage increase, in line with the multi-year average general wage increases
16 under similar collective agreements for the peer group of Ontario distributors identified
17 in the benchmarking evidence at Exhibit 4, Tab 1, Schedule 1.⁷

18

19 **Table 5: PWU General Wage Increases (2020-2026)**

2020	2021	2022*	2023	2024	2025	2026
2.3%	2.3%	2.5%	2.5%	2.5%	2.5%	3.0%

20

21 New collective agreement effective February 1, 2022 until January 31, 2027.

⁶ *Ontario Labour Relations Act*, 1995, S.O. 1995, c. 1, Sched. A, section 56.

⁷ The peer group consists of the large and mid-sized Ontario distributors: Hydro One, Hydro Ottawa, Alectra Utilities, Elexicon Energy, London Hydro, EnWin Utilities, and Enova Power. With the exception of Elexicon and Hydro One, these distributors serve the top 10 cities in Ontario (by population size). Hydro One was included in the peer group because it serves approximately 90 percent of the service territory in the province, and Elexicon Energy was included because it is the fourth largest municipality-owned electricity distributor in the province.

1 In addition to general wage increases, PWU employees not already paid at the top of the
2 wage scale are eligible, based on performance, for step increases as a result of
3 progression on the wage scale from one step to the next.

4

5 **4.2 Society Engineers Collective Agreement**

6 The utility's current collective agreement with the Society Engineers came into effect
7 January 1, 2020 and is valid until December 31, 2023. Table 6 below summarizes the year-
8 over-year general wage increases for Society Engineers employees.

9

10 **Table 6: Society Engineers General Wage Increases (2020-2023)**

2020	2021	2022	2023
1.20%	1.50%	1.60%	2.00%

11

12 In addition to general wage increases, Society Engineers employees are also eligible,
13 based on performance, for: (i) step increases as a result of progression on the wage scale
14 from one step to the next if not already paid at the top of the wage scale, and (ii) variable
15 performance pay based on achievement of the deliverables outlined in annual
16 performance contracts, as well as the achievement of the utility's performance
17 measures.

18

19 **4.3 Society IT Collective Agreement**

20 The Society of United Professionals was certified as the bargaining agent for applicable
21 Information Technology employees at Toronto Hydro on November 21, 2018. On
22 November 9, 2020, the Society of United Professionals First Collective Agreement with
23 Society IT employees was awarded beginning January 1, 2019 and expiring December 31,
24 2020. The utility's current collective agreement with Society IT employees came into

1 effect January 1, 2021 and is valid until December 31, 2025. Table 7 below summarizes
2 the year-over-year general wage increases for Society IT employees.

3 **Table 7: Society IT General Wage Increases (2020-2025)**

2020	2021	2022	2023	2024	2025
2.30%	1.50%	2.50%	2.50%	2.75%	3.00%

4

5 In addition to general wage increases, Society IT employees are also eligible, based on
6 performance, for: (i) step increases as a result of progression on the wage scale from one
7 step to the next if not already paid at the top of the wage scale, and (ii) variable
8 performance pay based on achievement of the deliverables outlined in annual
9 performance contracts, as well as the achievement of the utility's performance
10 measures.

11

12 **5. BENEFITS AND PENSIONS**

13 Toronto Hydro provides a pension for fulltime employees through its membership in
14 Ontario Municipal Employees Retirement System ("OMERS"), a multi-employer defined
15 benefit pension plan. In addition to OMERS, Toronto Hydro provides other employment
16 benefits to employees, including: medical insurance, including vision care, prescription
17 drugs, and paramedical services; dental insurance, including major dental and
18 orthodontic services; short-term disability ("STD") and long-term disability ("LTD")
19 income protection; and life insurance and accidental death and dismemberment
20 ("AD&D") insurance. Other benefits costs paid by Toronto Hydro include employer
21 contributions for the following:⁸

- 22 • Workplace Safety and Insurance Board ("WSIB") premiums;

⁸ Aside from pensions, all contributions are required under Canadian law.

- 1 • Pension contributions;
- 2 • Canadian Pension Plan contributions;
- 3 • Employment insurance contributions; and
- 4 • Employer health tax contributions.

5

6 Tables 8 and 9 below outline the cost of employee benefits for the current 2020-2024 and
 7 the future 2025-2029 rate periods, respectively.

8

9 **Table 8: 2020-2024 Employee Benefit Costs (\$ Millions)**

	2020 Actual	2021 Actual	2022 Actual	2023 Bridge	2024 Bridge
Employee Benefits Cost	52.4	49.0	50.1	55.9	██████

10

11 **Table 9: 2025-2029 Employee Benefit Costs (\$ Millions)**

	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast
Employee Benefits Cost	██████	██████	██████	██████	██████

12

13 Toronto Hydro periodically reviews the trends and costs associated with its benefit
 14 programs to help ensure that the program is aligned with the labour markets within which
 15 Toronto Hydro competes for talent.

16

17 As part of the study filed at Exhibit 4, Tab 4, Schedule 5, Mercer Canada reviewed Toronto
 18 Hydro’s market position for employer paid benefits in respect of two components: active
 19 benefits (e.g. life insurance, accidental death & dismemberment insurance, short-term
 20 disability, long-term disability, health and dental, health care spending account) and
 21 employer pension contributions.

1 For active benefits, Mercer found that Toronto Hydro provides a top quartile active
2 benefits plan when compared to the energy and general industry peer groups. For
3 pensions, relative to the overall market (which includes both defined benefit and defined
4 contribution plans),⁹ Toronto Hydro's pension arrangements through OMERS are above
5 the 50th percentile among both the energy and general industry peer group companies.
6 However, when considering only comparators that provide Defined Benefit pensions to
7 new hires, Toronto Hydro's pension arrangements through OMERS are aligned to the 50th
8 percentile relative to both the energy and general industry peer group companies.

9

10 Toronto Hydro conducts regular reviews to support effective program governance and
11 prudent cost management while providing a comprehensive and market-competitive
12 benefits program that supports the utility's ability to attract and retain talent in a highly
13 competitive labour market. For example, in 2022, Toronto Hydro complete a
14 comprehensive dependent eligibility review for all active employees with family coverage.

15

16 To manage benefits costs, Toronto Hydro also regularly negotiates with benefit providers
17 and conducts comprehensive vendor market reviews on a periodic basis. In 2021 Toronto
18 Hydro conducted a vendor market review for the Employee and Family Assistance
19 Program which resulted in the utility securing a new provider for employee mental health
20 and overall wellness at a reduced per member rate of approximately 30 percent.

21

22 Toronto Hydro offers its employees a number of health and wellness initiatives, including
23 the aforementioned Employee and Family Assistance Program that provides employees
24 and their dependents access to work-life/wellness resources such as support for mental

⁹ Determining the benefit that a pension plan member will receive in retirement depends on the type of plan. In a defined benefit plan, members can expect a predictable monthly income in retirement. In a defined contribution plan, the future benefit can vary because it is impacted by the returns earned by the investment pool. What is defined in this type of plan is the amount of contributions put into the plan.

1 health and relationship counselling. In 2020, Toronto Hydro introduced a virtual
2 healthcare program that offers 24/7 online access to healthcare professionals. The
3 program was introduced early during the pandemic to help mitigate the risk and spread
4 of COVID-19 by reducing the need for in-person medical walk-in clinic visits while still
5 ensuring employees had access to medical professionals. In 2022, Toronto Hydro
6 enhanced its coverage for mental health services (e.g. psychologists and social workers)
7 in recognition of the rising importance of mental health wellness.

8

9 Both participating employers and their employees are required to make contributions to
10 the OMERS pension plan. The required contribution rates are based on the employee's
11 earnings, and are periodically reviewed by the OMERS Sponsors Corporation relative to
12 the assets and obligations of the plan. Participating employees and employers currently
13 contribute to OMERS 9 percent of earnings up to the Yearly Maximum Pensionable
14 Earnings ("YMPE") and 14.6 percent on earnings above the YMPE. The YMPE is the
15 Canada Pension Plan ("CPP") earnings limit (i.e. contributions to the CPP are made on
16 earnings up to this limit). The OMERS contribution rate is lower up to the YMPE because
17 OMERS is designed to work together with CPP to provide combined pension benefits.

18

19 Tables 10 and 11 below summarize Toronto Hydro's pension costs, including capitalized
20 and expensed amounts each year, for the current 2020-2024 and the future 2025-2029
21 rate periods, respectively. Toronto Hydro's pension costs are recovered using a default
22 accrual basis.

1 **Table 10: 2020-2024 Pension Costs (\$ Millions)**

	2020 Actual	2021 Actual	2022 Actual	2023 Bridge	2024 Bridge
Pension Contributions	17.1	15.8	16.3	20.0	■
Less: Amount Capitalized	8.2	7.5	8.3	10.1	■
Amount Expensed	9.0	8.4	8.1	10.0	■

2 Please note that the numbers in the table may not sum due to rounding.

3

4 **Table 11: 2025-2029 Pension Costs (\$ Millions)**

	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast
Pension Contributions	■	■	■	■	■
Less: Amount Capitalized	■	■	■	■	■
Amount Expensed	■	■	■	■	■

5 Please note that the numbers in the table may not sum due to rounding.

6

7 In addition to pension benefits, Toronto Hydro pays certain medical, dental, and life
 8 insurance benefits on behalf of its retired employees. An actuarial analysis using the
 9 projected unit credit method determines the cost of these benefits. This method
 10 incorporates Toronto Hydro's best estimate of future salary levels, retirement ages of
 11 employees, health care costs, and other actuarial factors. The latest actuarial valuation
 12 was performed by Willis Towers Watson based on information current as of January 1,
 13 2022, and forecasts of post-employment benefit costs are based on extrapolations of
 14 those results (see Exhibit 4, Tab 4, Schedule 4, Appendix A).

15

16 Tables 12 and 13 below presents Toronto Hydro's post-employment benefit costs,
 17 including capitalized and expensed amounts, for the current 2020-2024 and the future

1 2025-2029 rate periods, respectively. Toronto Hydro’s post-employment benefit costs are
 2 recovered using a default accrual basis.

3

4 **Table 12: 2020-2024 Post-employment Benefit Costs (\$ Millions)**

	2020 Actual	2021 Actual	2022 Actual	2023 Bridge	2024 Bridge
Benefit Costs	15.7	14.6	13.9	11.5	█
Capitalized Amounts	7.4	6.9	7.0	5.8	█
Expensed Amounts	8.2	7.7	6.9	5.7	█

5 Please note that the numbers in the table may not sum due to rounding.

6

7 **Table 13: 2025-2029 Post-employment Benefit Costs (\$ Millions)**

	2025 Forecast	2026 Forecast	2027 Forecast	2028 Forecast	2029 Forecast
Benefit Costs	█	█	█	█	█
Capitalized Amounts	█	█	█	█	█
Expensed Amounts	█	█	█	█	█

8 Please note that the numbers in the table may not sum due to rounding.



January 27, 2023

Ms. Stazia Harding
Toronto Hydro Corporation
14 Carlton Street
Toronto, ON
M5B 1K5

Dear Stazia:

POST-EMPLOYMENT BENEFITS FOR EMPLOYEES OF TORONTO HYDRO
2022 YEAR-END DISCLOSURES AND ESTIMATED 2023 AND 2024 BENEFIT EXPENSE UNDER
INTERNATIONAL ACCOUNTING STANDARDS

As requested, this letter and appendices have been prepared for Toronto Hydro Corporation (“the Company”, or “Toronto Hydro”) and present the Company’s liabilities and costs in respect of the following post-retirement and post-employment benefits plans (“the Plans”):

- Extended health benefits for retirees and members on disability;
- Dental benefits for retirees and members on disability;
- Life insurance benefits for retirees;
- Vested and non-vested sick leave benefits;
- OMERS top up pension;
- Executive OMERS top up pension; and
- Executive retirement allowance.

This letter and appendices have been prepared for the Company and its external reporting, for the following purposes:

130 King St. West
Suite 1500
P.O. Box 424
Toronto, Ontario M5X 1E3
Canada

T +1 416 960 2700
W wtwco.com

Towers Watson Canada Inc.

- Determining the final calculation of the 2022 benefit expense under International Financial Reporting Standards (IFRS) in accordance with International Accounting Standards Section 19 (IAS 19),
- Providing the required information for year-end disclosure purposes as of December 31, 2022 under IAS 19, and
- Determining an estimate of the 2023 and 2024 benefit expenses under IAS 19.

The information contained in this letter and appendices are presented in thousands of Canadian dollars and are in respect of the benefits mentioned above only.

The 2022 net periodic benefit cost is based on the results of the January 1, 2020 actuarial valuation. The 2022 year-end disclosure obligation and extrapolations for 2023 and 2024 are based on the results of the January 1, 2022 actuarial valuation.

The balance of this letter sets out comments and notes to our calculations. Appendix A provides details of the relevant accounting results. Additional information regarding the summaries of the plan provisions, the membership data and the actuarial basis used in the January 1, 2022 valuation are going to be included in the forthcoming actuarial valuation report prepared by WTW.

Actuarial Assumptions and Methods

- The measurement date used for Fiscal 2022 year-end financial reporting is December 31, 2022.
- The 2022 benefit expense is based on a discount rate of 3.00% per annum and the defined benefit obligation (“DBO”) at December 31, 2022 is based on a discount rate of 5.10% per annum, as instructed by the Company. The discount rates are based on long-term high-quality Canadian corporate bond yields at December 31, 2021 and December 31, 2022, respectively.
- Other than those noted in this letter, the actuarial methods and assumptions used for the determination of the 2022 net periodic benefit cost are consistent with those used for the 2021 year-end disclosures and the actuarial methods and assumptions used for the December 31, 2022 obligation are consistent with those used for the January 1, 2022 valuation.
- The obligation as of December 31, 2022 and the 2023 and 2024 expense estimates are based on extrapolations from the January 1, 2022 valuation results for the medical, dental, life insurance, sick leave, OMERS top-up and retirement allowance benefit plans, assuming no experience gains or losses other than from actual benefit payments being different from expected, and reflecting changes in assumptions as at the measurement date. As instructed by the Company, the 2023 preliminary expense reflects a one-time adjustment to the Retirement Allowance gain/loss, reflected as at January 1, 2023, impacting 2023 preliminary gains and losses recognized in expense and OCI.

Accounting Methods

- Under IAS 19, we understand that Toronto Hydro has determined that both the non-vested sick leave benefit program and the vested sick leave benefit program should be included for post-employment benefits reporting. As such, these benefits are included in the financial information under IAS 19 presented in this letter.
- On an ongoing basis, actuarial gains and losses for all benefit plans other than the sick leave benefits plan and the incentive plan retirement allowance will be immediately recognized in other comprehensive income. Actuarial gains and losses for the sick leave benefit plan and the incentive plan retirement allowance will be recognized immediately in expense.

- On an ongoing basis, the impact of plan changes will be immediately recognized in benefit expense.

Summary of Financial Results

The summary of Fiscal 2022 benefit expense, the defined benefit liability and the DBO as at December 31, 2022, under IAS 19 is as follows (in \$ 000s):

(\$000s)	Fiscal 2022 Net Periodic Benefit Costs	Defined Benefit Asset/(Liability) at December 31, 2022	DBO at December 31, 2022
Electric System Limited	9,255	(221,692)	221,692
Toronto Hydro Corporation	993	(5,779)	5,779
Energy Service Incorporated	34	(1,131)	1,131
LDC Unregulated	99	(1,357)	1,357
Consolidated	10,381	(229,959)	229,959

- Actual benefit payments for 2022 of \$10,427,590 are based on information provided by the Company on January 10, 2023. We have projected 2023 and 2024 benefit payments based on the valuation assumptions.

Other Comments

- We understand that the post-employment benefits plans are not pre-funded, and therefore our accounting results do not consider any expected investment income on plan assets.
- As directed by the Company, the full defined benefit liability has been classified as a non-current liability.
- We understand that the Company could be making adjustments to the results presented herein, in respect to certain executive employees currently on salary continuance. Reflecting any adjustments for these participants is beyond the scope of our engagement with the Company. As instructed by the Company on November 25, 2021, we haven't made any adjustments for these participants.
- Other than those described in this letter and appendices, the Company's management has confirmed that there have been no significant events, changes to the plan provisions or changes to plan membership since January 1, 2022 for all benefit plans, that would materially affect the results of our valuations.

The breakdown of net actuarial (gain)/loss as at December 31, 2022 is as follows (in \$000s):

	Electric System Limited	Toronto Hydro Corporation	Energy Service Incorporated	LDC Unregulated	Total
Demographic Assumptions:					
Sick Leave Program	(164)	-	-	-	(164)
Retirement Allowance #1	-	-	-	-	-
Other Plans	2,114	(95)	-	9	2,028
Economic Assumptions:					
Sick Leave Program	(266)	-	-	-	(266)
Retirement Allowance #1	-	(70)	-	-	(70)
Other Plans	(82,079)	(1,814)	(420)	(523)	(84,836)
Plan Experience:					
Sick Leave Program	(3,209)	-	-	-	(3,209)
Retirement Allowance #1	-	(59)	-	-	(59)
Other Plans	5,219	507	400	46	6,172
Total Net Actuarial (Gain)/Loss:					
Sick Leave Program	(3,639)	-	-	-	(3,639)
Retirement Allowance #1	-	(129)	-	-	(129)
Other Plans	(74,746)	(1,402)	(20)	(468)	(76,636)
Sub-Total	(78,385)	(1,531)	(20)	(468)	(80,404)

Actuarial Certification

The Company may make a copy of this report available to its auditors, but we make no representation as to the suitability of this report for any purpose other than that for which it was originally provided and accept no responsibility or liability to the Company's auditors in this regard. We are aware that the information contained in this report will be used to support the audit of the Company's financial statements. Except where we expressly agree in writing, this report should not be disclosed or provided to any third party, other than as provided above. WTW accepts no responsibility for any consequences arising from any other party relying on this report or any advice relating to its contents.

In preparing these results, we have relied upon information and data provided to us orally, electronically and/or in writing by the Company and other persons or organizations designated by the Company. We have relied on all the data and information provided, including plan provisions and membership data as being complete and accurate. Based on discussions with and concurrence by the plan sponsor, assumptions or estimates may have been made if data were not available. We have not independently verified the accuracy or completeness of the data or information provided, but we have performed limited checks for consistency.

We are not aware of any errors or omissions in the data that would have a significant effect on the results of our calculations.

The results presented in this report are directly dependent upon the accuracy and completeness of the underlying data and information. Any material inaccuracy in the data, plan provisions or other information provided to us may have produced results that are not suitable for the purposes of this report and such inaccuracies may produce materially different results that could require that a revised report be issued.

The results summarized in this report involve actuarial calculations that require assumptions about future events. The Company is responsible for the selection of the assumptions, as required by IAS 19. Other assumptions may also be reasonable and appropriate, and their use would produce different results.

The results provided in this report reflect data and assumptions appropriate for the purpose of the measurement. As of the date of this report, there remains significant uncertainty regarding the effects on financial markets, regulations and experience for the following:

- The long-term effects of the COVID-19 pandemic;
- Events related to Russia's military action against Ukraine that commenced on February 24, 2022

The results presented in this report make no explicit allowances for the effects of these events as at December 31, 2022. As these events evolve, there may be significant impacts on plan experience and/or assumptions use in future measurements.

The expense and obligation levels will change in the future as a result of future changes in the actuarial methods and assumptions, the membership data, the plan provisions, accounting rules, legislature, and the government health care programs, or as a result of future experience gains or losses. None of these changes has been anticipated at this time but will be revealed in future accounting valuations.

The figures provided in this letter reflect, to the best of our knowledge, all of the Company's substantive commitments and obligations, as described herein. Furthermore, to the best of our knowledge, there are no subsequent events, the occurrence of which is probable and the effects of which are reasonably estimable, which have not been reflected in the figures provided as of the date of our letter.

In our opinion:

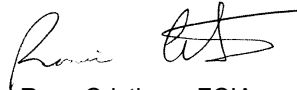
- the membership data on which the valuation is based are sufficient and reliable for purposes of the valuation;
- the assumptions are appropriate for the purposes of the valuation;
- the methods employed in the valuation are appropriate for the purposes of the valuation;
- the calculations have been made in accordance with our understanding of the requirements of IAS 19 and the Company's accounting policies.

This report has been prepared, and our opinions given, in accordance with accepted actuarial practice in Canada.

We are pleased to provide you with this year-end disclosure report. Please contact us if you need any additional information.



Carl Larose, FCIA
Direct Dial: (514) 982-3013



Ross Cristiano, FCIA
Direct Dial: (416) 960-2837

Toronto, Ontario
January 27, 2023

Enclosures

cc:

Sandra Lau, Claudia Oancea, Helen MacDonald, Dave Clark - THC
Edward Eun, Dion Salandy and Graham Allison - WTW

Post-Employment Benefits Plan - IFRS (rev. 2011) - 2022 Year-End Disclosure Information (\$ 000's)

	Electric System Limited	Toronto Hydro Corporation	Energy Services Incorporated	LDC Unregulated	Consolidated
Statement of Financial Position at Beginning of Period					
January 1, 2022					
Defined Benefit Asset/(Liability) at Beginning of Period	(297,479)	(6,205)	(1,167)	(1,791)	(306,642)
Reconciliation of Defined Benefit Obligation					
2022					
Defined Benefit Obligation at Beginning of Period	297,479	6,205	1,167	1,791	306,642
Employer Service Cost at Beginning of Period	2,675	345	-	44	3,064
Interest Cost	8,900	212	34	55	9,201
Past Service Cost (Credit)	1,319	565	-	-	1,884
Net Actuarial (Gain) or Loss					-
<i>Sick Leave Plan</i>	(3,639)	-	-	-	(3,639)
<i>Retirement Allowance Benefit</i>	-	(129)	-	-	(129)
<i>Other Plans</i>	(74,746)	(1,402)	(20)	(468)	(76,636)
<i>Total Net Actuarial (Gain) or Loss</i>	(78,385)	(1,531)	(20)	(468)	(80,404)
Benefits Paid Directly by the Employer	(10,296)	(17)	(50)	(65)	(10,428)
Defined Benefit Obligation at Current Period End	221,692	5,779	1,131	1,357	229,959
Change in Plan Assets					
2022					
Fair Value of Plan Assets at Prior Period End	-	-	-	-	-
Employer Contributions	10,296	17	50	65	10,428
Benefits Paid	(10,296)	(17)	(50)	(65)	(10,428)
Fair Value of Plan Assets at Current Period End	-	-	-	-	-
Total Benefit (Expense)/Income for Period					
2022					
Employer Service Cost at Beginning of Period	2,675	345	-	44	3,064
Interest Cost	8,900	212	34	55	9,201
Past Service Cost (Credit)	1,319	565	-	-	1,884
Actuarial (Gain)/Loss Recognized in Expense	(3,639)	(129)	-	-	(3,768)
Total Benefit Expense/(Income)	9,255	993	34	99	10,381
Reconciliation of Balance Sheet					
2022					
Defined Benefit Asset/(Liability) at Prior Period End	(297,479)	(6,205)	(1,167)	(1,791)	(306,642)
Total Benefit (Expense)/Income for Period	(9,255)	(993)	(34)	(99)	(10,381)
Benefits Paid Directly by the Employer	10,296	17	50	65	10,428
Gain/(Loss) Recognized via OCI	74,746	1,402	20	468	76,636
Defined Benefit Asset/(Liability) at Current Period End	(221,692)	(5,779)	(1,131)	(1,357)	(229,959)
Change in Accumulated Other Comprehensive Income					
2022					
Cumulative Actuarial (Gain)/Loss Recognized via OCI at Prior Period End	23,151	(1,934)	(2,166)	189	19,240
Actuarial (Gain)/Loss Recognized via OCI for Period	(74,746)	(1,402)	(20)	(468)	(76,636)
Cumulative Actuarial (Gain)/Loss Recognized via OCI at Current Period End	(51,595)	(3,336)	(2,186)	(279)	(57,396)
Statement of Financial Position at End of Period					
December 31, 2022					
Defined Benefit Asset/(Liability) at Current Period End	(221,692)	(5,779)	(1,131)	(1,357)	(229,959)
Breakdown of Defined Benefit Obligation: Current and Non-Current					
December 31, 2022					
Current Liabilities	-	-	-	-	-
Non-Current Asset/(Liability)	(221,692)	(5,779)	(1,131)	(1,357)	(229,959)
Defined Benefit Asset/(Liability) at Current Period End	(221,692)	(5,779)	(1,131)	(1,357)	(229,959)

Sensitivity to Changes in Medical and Dental Trend Rate Assumption

Effect on total of service and interest cost for 2022					
1% point increase	1,568	5	5	15	1,593
1% point decrease	(1,373)	(4)	(4)	(14)	(1,395)
Effect on accrued benefit obligation at December 31, 2022					
1% point increase	24,520	136	145	157	24,958
1% point decrease	(21,295)	(115)	(127)	(138)	(21,675)

Sensitivity to Changes in Discount Rate Assumption

Effect on total of service and interest cost for 2022					
1% point increase	537	(23)	5	(4)	515
1% point decrease	(940)	20	(7)	1	(926)
Effect on accrued benefit obligation at December 31, 2022					
1% point increase	(26,105)	(641)	(136)	(169)	(27,051)
1% point decrease	32,130	783	166	206	33,285

Sensitivity to Changes in Mortality Rates Assumption

Effect on accrued benefit obligation at December 31, 2022					
Set back 1 year	6,802	75	38	37	6,952
Set forward 1 year	(6,719)	(80)	(37)	(37)	(6,873)

Key Assumptions

Discount rate at Dec 31/22 (used for Dec 31/22 obligation)	5.10%	5.10%	5.10%	5.10%	5.10%
Discount rate at Dec 31/21 (used for 2022 Benefit Costs)	3.00%	3.00%	3.00%	3.00%	3.00%
Assumed medical and dental cost trend rate at December 31, 2022					
Dental care cost trend rate assumed for next year	4.00%	4.00%	4.00%	4.00%	4.00%
Health care cost trend rate assumed for next year	5.10%	5.10%	5.10%	5.10%	5.10%

Expected Benefit Payments

Following Year	10,752	287	48	53	11,140
Following Year +1	11,233	244	49	55	11,581
Following Year +2	11,504	289	50	57	11,900
Following Year +3	11,692	193	51	61	11,997
Following Year +4	11,939	466	54	64	12,523
Following Year +5	12,173	408	57	67	12,705
Modified Duration at the end of the year	13.0	13.3	13.2	13.7	13.0

Post-Employment Benefits Plan - IFRS (rev. 2011) - 2023 Expense Estimate (\$ 000's)

	Electric System Limited	Toronto Hydro Corporation	Energy Services Incorporated	LDC Unregulated	Consolidated
January 1, 2023					
Statement of Financial Position at Beginning of Period					
Defined Benefit Asset/(Liability) at Beginning of Period	(221,692)	(5,779)	(1,131)	(1,357)	(229,959)
2023					
Reconciliation of Defined Benefit Obligation					
Defined Benefit Obligation at Beginning of Period	221,692	5,779	1,131	1,357	229,959
Employer Service Cost at Beginning of Period	1,544	264	-	5	1,813
Interest Cost	11,111	301	56	68	11,536
Net Actuarial (Gain) or Loss	-	-	-	-	-
<i>Sick Leave Plan</i>	-	-	-	-	-
<i>Retirement Allowance Benefit</i>	-	94	-	-	94
<i>Other Plans</i>	-	(94)	-	-	(94)
<i>Total Net Actuarial (Gain) or Loss</i>	-	-	-	-	-
Benefits Paid Directly by the Employer	(10,752)	(287)	(48)	(53)	(11,140)
Defined Benefit Obligation at Current Period End	223,595	6,057	1,139	1,377	232,168
2023					
Change in Plan Assets					
Fair Value of Plan Assets at Prior Period End	-	-	-	-	-
Employer Contributions	10,752	287	48	53	11,140
Benefits Paid	(10,752)	(287)	(48)	(53)	(11,140)
Fair Value of Plan Assets at Current Period End	-	-	-	-	-
2023					
Total Benefit (Expense)/Income for Period					
Employer Service Cost at Beginning of Period	1,544	264	-	5	1,813
Interest Cost	11,111	301	56	68	11,536
Actuarial (Gain)/Loss Recognized in Expense	-	94	-	-	94
Total Benefit Expense/(Income)	12,655	659	56	73	13,443
2023					
Reconciliation of Balance Sheet					
Defined Benefit Asset/(Liability) at Prior Period End	(221,692)	(5,779)	(1,131)	(1,357)	(229,959)
Total Benefit (Expense)/Income for Period	(12,655)	(659)	(56)	(73)	(13,443)
Benefits Paid Directly by the Employer	10,752	287	48	53	11,140
Gain/(Loss) Recognized via OCI	-	94	-	-	94
Defined Benefit Asset/(Liability) at Current Period End	(223,595)	(6,057)	(1,139)	(1,377)	(232,168)
2023					
Change in Accumulated Other Comprehensive Income					
Cumulative Actuarial (Gain)/Loss Recognized via OCI at Prior Period End	(51,595)	(3,336)	(2,186)	(279)	(57,396)
Actuarial (Gain)/Loss Recognized via OCI for Period	-	(94)	-	-	(94)
Cumulative Actuarial (Gain)/Loss Recognized via OCI at Current Period End	(51,595)	(3,430)	(2,186)	(279)	(57,490)
December 31, 2023					
Statement of Financial Position at End of Period					
Defined Benefit Asset/(Liability) at Current Period End	(223,595)	(6,057)	(1,139)	(1,377)	(232,168)
December 31, 2023					
Breakdown of Defined Benefit Obligation: Current and Non-Current					
Current Liabilities	-	-	-	-	-
Non-Current Asset/(Liability)	(223,595)	(6,057)	(1,139)	(1,377)	(232,168)
Defined Benefit Asset/(Liability) at Current Period End	(223,595)	(6,057)	(1,139)	(1,377)	(232,168)
Key Assumptions					
Discount rate at Dec 31/22 (used for December 31, 2023 obligation)	5.10%	5.10%	5.10%	5.10%	5.10%
Discount rate at Dec 31/22 (used for 2023 Benefit Costs)	5.10%	5.10%	5.10%	5.10%	5.10%
Assumed medical and dental cost trend rate at December 31, 2023					
Dental care cost trend rate assumed for next year	4.00%	4.00%	4.00%	4.00%	4.00%
Health care cost trend rate assumed for next year	5.10%	5.10%	5.10%	5.10%	5.10%
Expected Benefit Payments for Following Year					
	11,233	244	49	55	11,581

Post-Employment Benefits Plan - IFRS (rev. 2011) - 2024 Expense Estimate (\$ 000's)

	Electric System Limited	Toronto Hydro Corporation	Energy Services Incorporated	LDC Unregulated	Consolidated
Statement of Financial Position at Beginning of Period					
January 1, 2024					
Defined Benefit Asset/(Liability) at Beginning of Period	(223,595)	(6,057)	(1,139)	(1,377)	(232,168)
Reconciliation of Defined Benefit Obligation					
2024					
Defined Benefit Obligation at Beginning of Period	223,595	6,057	1,139	1,377	232,168
Employer Service Cost at Beginning of Period	1,623	277	-	5	1,905
Interest Cost	11,200	317	57	69	11,643
Net Actuarial (Gain) or Loss	-	-	-	-	-
Benefits Paid Directly by the Employer	(11,233)	(244)	(49)	(55)	(11,581)
Defined Benefit Obligation at Current Period End	225,185	6,407	1,147	1,396	234,135
Change in Plan Assets					
2024					
Fair Value of Plan Assets at Prior Period End	-	-	-	-	-
Employer Contributions	11,233	244	49	55	11,581
Benefits Paid	(11,233)	(244)	(49)	(55)	(11,581)
Fair Value of Plan Assets at Current Period End	-	-	-	-	-
Total Benefit (Expense)/Income for Period					
2024					
Employer Service Cost at Beginning of Period	1,623	277	-	5	1,905
Interest Cost	11,200	317	57	69	11,643
Total Benefit Expense/(Income)	12,823	594	57	74	13,548
Reconciliation of Balance Sheet					
2024					
Defined Benefit Asset/(Liability) at Prior Period End	(223,595)	(6,057)	(1,139)	(1,377)	(232,168)
Total Benefit (Expense)/Income for Period	(12,823)	(594)	(57)	(74)	(13,548)
Benefits Paid Directly by the Employer	11,233	244	49	55	11,581
Gain/(Loss) Recognized via OCI	-	-	-	-	-
Defined Benefit Asset/(Liability) at Current Period End	(225,185)	(6,407)	(1,147)	(1,396)	(234,135)
Change in Accumulated Other Comprehensive Income					
2024					
Cumulative Actuarial (Gain)/Loss Recognized via OCI at Prior Period End	(51,595)	(3,430)	(2,186)	(279)	(57,490)
Actuarial (Gain)/Loss Recognized via OCI for Period	-	-	-	-	-
Cumulative Actuarial (Gain)/Loss Recognized via OCI at Current Period End	(51,595)	(3,430)	(2,186)	(279)	(57,490)
Statement of Financial Position at End of Period					
December 31, 2024					
Defined Benefit Asset/(Liability) at Current Period End	(225,185)	(6,407)	(1,147)	(1,396)	(234,135)
Breakdown of Defined Benefit Obligation: Current and Non-Current					
December 31, 2024					
Current Liabilities	-	-	-	-	-
Non-Current Asset/(Liability)	(225,185)	(6,407)	(1,147)	(1,396)	(234,135)
Defined Benefit Asset/(Liability) at Current Period End	(225,185)	(6,407)	(1,147)	(1,396)	(234,135)
Key Assumptions					
Discount rate at Dec 31/22 (used for December 31, 2024 obligation)	5.10%	5.10%	5.10%	5.10%	5.10%
Discount rate at Dec 31/22 (used for 2024 Benefit Costs)	5.10%	5.10%	5.10%	5.10%	5.10%
Assumed medical and dental cost trend rate at December 31, 2024					
Dental care cost trend rate assumed for next year	4.00%	4.00%	4.00%	4.00%	4.00%
Health care cost trend rate assumed for next year	5.10%	5.10%	5.10%	5.10%	5.10%
Expected Benefit Payments for Following Year					
	11,504	289	50	57	11,900

Non-Executive Compensation and Benefits Review

Toronto Hydro Electric System Limited



13 March 2023

Introduction and Executive Summary

Mercer Canada Limited (“Mercer”) has been engaged by Toronto Hydro Electric System Limited (“THESL”) to conduct a complete market review of compensation and benefits program competitiveness for union and non-union within Toronto Hydro.

The purpose of this review is to provide an independent, market-based assessment of the market positioning of THESL’s non-executive total remuneration that includes base salary, short-term incentives, total cash compensation, active employee benefits, and pensions relative to the markets THESL competes with for talent. THESL employee groups considered include non-union professionals (i.e non-executive) and union positions represented by the Power Workers’ Union (“PWU”) and the Society of United Professionals (“SIT” or “SE”).

Executive Summary

This review approach is consistent with Mercer’s standard market benchmarking methodologies, and relies on compensation and benefits practices information provided by THESL, in addition to Mercer’s proprietary compensation databases. Market comparisons are made to a group of peer organizations, selected by Mercer and confirmed by THESL, that are representative of the energy and general industry sectors THESL competes with for talent.

In conducting the compensation analysis, Mercer worked together with THESL to identify benchmark positions to compare to market that represent a valid cross sample of the organization’s functions and levels. The breadth of benchmark positions selected is within the range of 50% to 75% of employees, considered best practice when benchmarking on an organization basis. The benchmarking review includes positions that represent approximately 67% of employees at THESL.

Mercer considers compensation levels to be within a “competitive range” if they fall within 10% of the target market positioning on a position-by-position basis (where you have a smaller sample size and higher variability in observations) and 5% on an overall organization basis (where you have a larger sample size and smaller variability in observations) when compared to target positioning (e.g., the 50th percentile).

On an overall organization basis, THESL’s total remuneration, including the value of all cash compensation, benefit and pension plans are positioned within a market competitive range relative to the 50th percentile of the energy market, and are above the general industry market. The general industry market is generally representative of publicly traded, for-profit organizations. Competitive positioning varies by job and by level within THESL. Union and non-union positions are generally positioned competitively against the 50th percentile of the energy sector and at or above the market 50th percentile against the general industry due to the availability of base salary and pension and benefits in the general industry. Society and PWU represented roles are generally positioned competitively against the energy sector, and are reflective of energy sector specific positions.

Methodology

Mercer worked with THESL to determine the appropriate markets and organizations for comparison given the organizations they compete with for talent (i.e., organizations that Toronto Hydro might reasonably recruit employees from or lose employees to) and that are comparable in scope or type of operations. Two specific peer groups were identified for the purposes of the compensation and benefits review:

- **Energy Peer Group**
 - Reflects select Canadian organizations from Mercer’s Total Compensation Survey (“MTCS”) and proprietary custom surveys with energy industry-specific roles
 - Organizations were selected considering the comparability of their operations, relative size of revenues and full-time employee equivalents when compared to THESL, resulting in a peer group primarily consisting of other energy utilities
- **General Industry Peer Group**
 - Reflects select for-profit Canadian Organizations from Mercer’s Benchmark Database (“MBD”) that includes general industry roles and organizations
 - Aligned with Mercer’s standard benchmarking methodology, organizations are generally within ½ to 2x the size of THESL on the basis of annual revenue
 - Where required to provide statistically significant market information for a specific position, the peer group is expanded to include organizations within 1/3 to 3x the size of THESL on the basis of annual revenue

A listing of organizations that belong to each of these peer groups for the purposes of either cash compensation, benefits or pension benchmarking is presented in Appendix A.

A sample of THESL’s jobs across all grades were benchmarked against equivalent roles within organizations from the defined peer groups. Equivalences were determined on the basis of overlaps in responsibilities between THESL and survey position descriptions.

- 47 non-union jobs at THESL were matched to equivalent survey jobs and levels in the two peer groups.
- 14 union jobs were matched to equivalent survey jobs and levels in the energy peer group, as positions are generally energy industry specific in their responsibilities

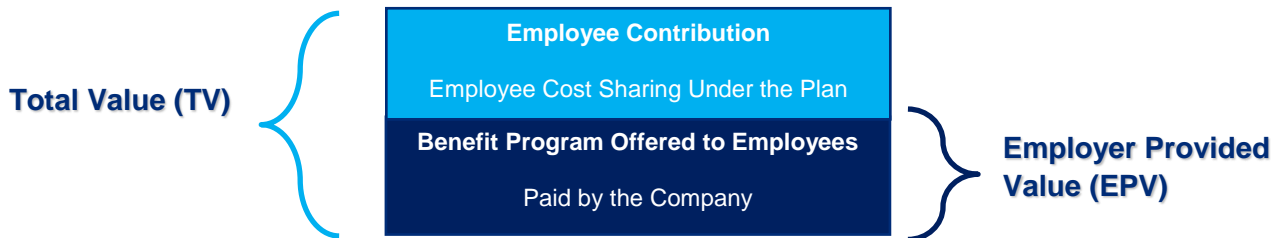
Mercer’s benchmarking objective with this review is to map a reasonable sample of THESL’s positions that best represent the total employee population across the different job levels in the organization. With this approach, our analysis includes 67% of the total population considered in-scope for this review. Mercer believes this to be a statistically reliable and representative sample for assessing the competitive levels of total remuneration for THESL’s employees.

A listing of the specific THESL benchmark positions matched to market as part of this review is presented in Appendix B.

Cash compensation levels tend to be aligned with the scope and complexity of the individual position and as such, to the extent possible, Mercer analyzed market data specific to the individual position. Benefit and pension programs tend to be common to all participants within a defined group and, as such comparisons to market are made on a plan or aggregate basis for each employee group (e.g., non-union, Society, PWU, etc.).

For the retirement and benefits program review, Mercer similarly benchmarked THESL against the energy peer group and general industry peer groups for organizations available in the Mercer Plan Design databases considering their relative **employer provided value** (“EPV”). Relative value analysis focuses only on the plan design as it sets all other cost drivers at a common level and is more consistent when comparing the value of the benefit programs of several organizations.

We note how benchmarking Total Value (TV) compares to Employer Provided Value (EPV) for the benefits analysis:



Plans for all comparator organizations have been valued using the same earnings information and composite workforce profile. Using different earnings levels would change the dollar value of the benefit, but any change in relative value of the plan amongst the participants would not, in Mercer’s opinion, be material.

As each element of the total remuneration package serves a different role, and companies may choose to offer a different pay mix in order to accomplish different objectives, Mercer recommends THESL consider the competitiveness of its total remuneration package as a whole (considering total remuneration) rather than the competitiveness of each individual compensation element. In order to provide a complete picture, report findings and observations are presented for separate compensation elements as well as aggregate total remuneration.

All compensation data is reflective of the most recently available data as of the completion of the analysis, and is presented effective for 2022.

Summary of Findings

Our commentary describes the competitiveness of THESL’s base salary, short-term incentive, total cash compensation and total remuneration at an aggregate level for each grade in the organization, relative to the 50th percentile of the respective market. Based on Mercer’s compensation practices and policy research, the majority of organizations target compensation at the 50th percentile of their competitive market, which balances fiduciary and cost considerations with the need to attract and retain talent.

- As stated above, Mercer considers THESL to be within the competitive range if they fall within 10% of the target market positioning on a position-by-position basis and 5% on the overall grade and organization basis.
- Market figures are presented where there is sufficient data to show the 50th percentile (Conversely, insufficient data is denoted by a “-”).

The table below presents THESL’s base salaries, target STI, target total cash compensation (TTC) and total remuneration (TRem) at an aggregate level, compared to the market 50th percentile across the two peer groups:

	ABOVE MARKET (+5%)
	BELOW MARKET (-5%)

Toronto Hydro					Energy Peer Group				General Industry Peer Group			
Grade	Base Salary (\$) ¹	Target STI (%)	TTC (\$) ²	TRem (\$) ³	Base Salary (\$) ¹	Target STI (%)	TTC (\$) ²	TRem (\$) ³	Base Salary (\$) ¹	Target STI (%)	TTC (\$) ²	TRem (\$) ³
Y3	\$190	25%	\$237	\$286	\$211 -10%	23% 2%	\$260 -9%	\$296 -3%	\$196 -3%	25% 0%	\$237 0%	\$282 1%
Y1	\$148	15%	\$171	\$205	\$177 -16%	21% -6%	\$219 -22%	\$257 -20%	\$157 -6%	19% -4%	\$180 -5%	\$205 0%
W4	\$139	10%	\$153	\$182	\$149 -7%	16% -6%	\$171 -11%	\$192 -5%	\$130 7%	15% -5%	\$147 4%	\$165 10%
W3	\$131	10%	\$144	\$169	\$139 -6%	14% -4%	\$158 -9%	\$177 -4%	\$138 -6%	17% -7%	\$164 -13%	\$179 -5%
W2	\$113	8%	\$122	\$150	\$106 6%	15% -7%	\$129 -6%	\$150 0%	\$109 3%	13% -5%	\$123 -1%	\$141 6%
V4	\$131	8%	\$141	\$169	\$127 3%	10% -2%	\$136 4%	\$156 8%	\$131 0%	10% -2%	\$146 -3%	\$160 6%
V3	\$123	8%	\$133	\$158	\$123 0%	11% -3%	\$136 -2%	\$157 1%	\$113 9%	11% -3%	\$130 2%	\$145 9%
V2	\$113	8%	\$122	\$145	\$115 -2%	10% -2%	\$125 -2%	\$142 2%	\$109 4%	10% -2%	\$119 3%	\$131 11%
V1	\$102	8%	\$110	\$133	\$107 -5%	10% -2%	\$117 -6%	\$134 -1%	\$97 5%	11% -3%	\$101 9%	\$114 17%
V0	\$90	8%	\$97	\$118	\$87 3%	9% -1%	\$95 3%	\$111 6%	\$76 18%	8% 0%	\$83 17%	\$94 25%
U2	\$81	6%	\$86	\$105	\$85 -4%	9% -3%	\$90 -5%	\$105 0%	\$79 2%	8% -2%	\$86 1%	\$96 9%
U1	\$74	6%	\$78	\$96	\$79 -7%	9% -3%	\$80 -2%	\$95 1%	\$70 6%	7% -1%	\$72 10%	\$82 18%
T1	\$58	6%	\$62	\$76	\$65 -11%	6% 0%	\$66 -7%	\$78 -2%	\$58 0%	5% 1%	\$56 9%	\$65 17%
SIT	\$107	8%	\$115	\$139	\$101 5%	9% -1%	\$108 7%	\$128 8%	\$92 15%	7% 1%	\$87 33%	\$99 41%
SE	\$123	8%	\$133	\$158	\$111 10%	10% -2%	\$122 9%	\$142 11%	\$106 16%	10% -2%	\$116 14%	\$130 21%
PWU	\$111	--	\$111	\$133	\$101 10%	8% --	\$105 6%	\$124 7%	-- --	-- --	-- --	-- --
Overall					98%		95%	99%	103%		103%	110%

(1) Toronto Hydro base salary reflects salary structure job rates
 (2) Toronto Hydro target total cash (“TTC”) reflects salary structure job rates plus target short-term incentives
 (3) Total remuneration (“TRem”) reflects target total cash compensation plus the value of long-term incentives, pensions and benefits
 Note: Figures are rounded to the nearest thousand (dollars) or percent

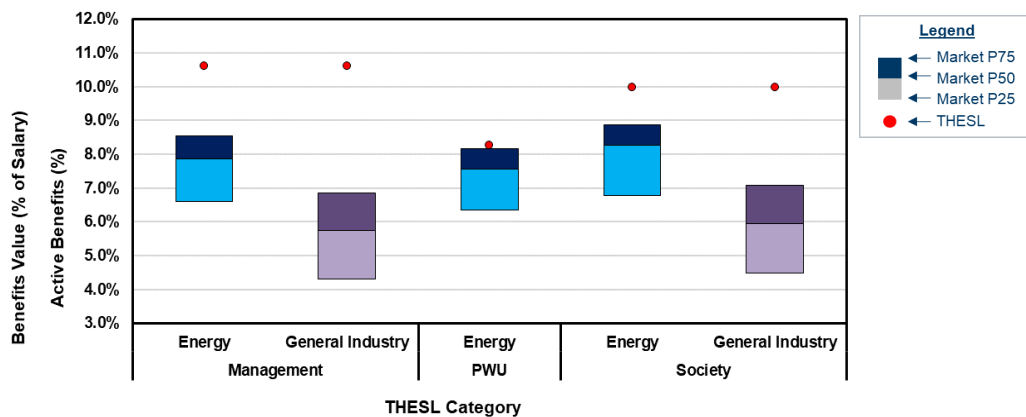
Overall, Toronto Hydro’s compensation program, on a **total remuneration** basis, is closely aligned with the 50th percentile market pay levels of the energy peer group, the most comparable peer group given relative roles and responsibilities, and is above the market competitive level relative to the general industry peer group. Relative to the energy peer group, Y1 is the only grade that falls below the market 50th percentile for total remuneration. When compared to the general industry peer group, the majority of positions are positioned within or above the market 50th percentile, with the exception of W3 which is below the market competitive range.

On **base salaries** for non-union positions, Toronto Hydro is generally within the market competitive zone. Exceptions include Y1 which is below the competitive range relative to both the energy peer group and general industry peer group, and T1 which is below the competitive range relative to only the energy peer group. Salary grade V0 is above the market competitive range compared to general industry peers. Additionally, PWU and Society represented positions are paid above the competitive range relative to both the energy and general industry peer groups.

Market eligibility for **short-term incentives (“STI”)** is generally more prevalent for team leader levels and above (i.e., close to 100% eligibility for jobs benchmarked to the W2 grade level and above). In comparison, THESL offers incentive pay for all positions, except for the PWU represented positions. On STI target opportunity, THESL is below market competitiveness for both energy and general industry peers.

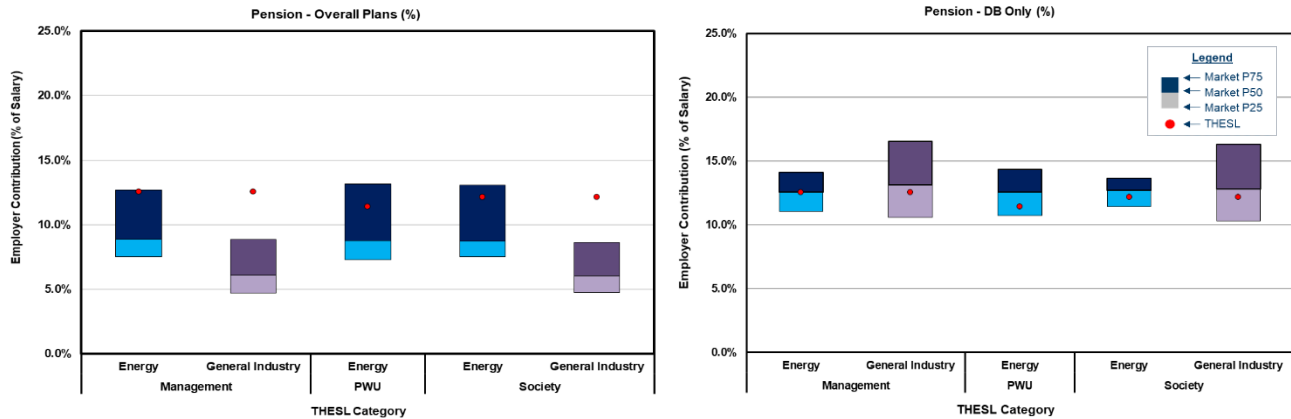
Overall, on **total cash compensation**, THESL remains within the range of market competitiveness for both the energy and general industry peer group. Grades Y3, Y1, W4 and W3 are below the competitive range relative to the energy peer group. Compared to the general industry peer group, all grades are within or above the competitive range, with the exception of W3 whose total cash compensation is below the competitive range. Consistent with base salary, PWU and Society represented positions are paid above the competitive range relative to both the energy and general industry peer groups.

To illustrate the impact of the benefits element on total remuneration, the tables below present THESL’s **active benefits** and **pension** value for each employee group considering employer-provided value, compared to the market 50th percentile across the two peer groups.



When compared to the energy and general industry peer groups, THESL provides a top quartile active benefits plan, which is the overall value of active benefits (including life insurance, accidental death and dismemberment, short-term disability, long-term disability, healthcare spending account and health and dental) across all employee groups. Overall, THESL’s position for active group

benefits is driven by above market disability, health and dental benefits, many of which have been enhanced to incorporate higher maximums or annual limits in the past 5 years.



THESL’s pension arrangements through OMERS for all employees are above the 50th percentile of the employer provided value among both the energy and general industry peer group companies. The energy sector market median is higher than the general industry because the energy sector has about half of the comparators providing Defined Benefits (“DB”) pensions to new hires, while the general industry is dominated by Defined Contribution pension and savings plans that provide less value than DB pensions. The trend continues to be away from DB plans in the private sector, while the public sector remains mainly DB.

When considering only comparators that continue to provide DB pensions to new hires, THESL’s pension for non-union employees is aligned to the 50th percentile of the employer provided value among both the energy and general industry peer group companies.

We note that the employer-provided pension value for the OMERS pension plan is set to 50% of the total value of the plan, since the cost of the plan is equally shared between Toronto Hydro and employees. Compared to a traditional single employer provided Defined Benefit pension plan, where the employer is responsible for all risk in the plan and the employee is only responsible for contributing a fixed contribution rate, this structure reduces the risk to Toronto Hydro.

Appendix A

The following companies comprise the **energy peer group** used for the purposes of the review:

ENERGY INDUSTRY COMPARATOR COMPANIES	
Alectra Inc.*	Hydro One Inc.*
Algonquin Power & Utilities Corp*	Hydro Ottawa Limited*
AltaLink L.P.	Hydro-Quebec*
ATCO Electric*	Manitoba Hydro*
BC Hydro Power & Authority*	Nalcor Energy*
Capital Power Corporation	New Brunswick Power *
ENMAX Corporation*	Nova Scotia Power (Emera, Inc.)*
EPCOR Utilities*	Ontario Power Generation*
Fortis, Inc. - FortisAlberta, Inc.	SaskPower*
Fortis, Inc. - FortisBC, Inc.	TransAlta Corporation*

(*) Energy companies from the Mercer Plan Design databases used in the benefits analysis

The following companies comprise a sample of the **general industry peers** used in the review:

GENERAL INDUSTRY COMPARATOR COMPANIES	
Aecon Group, Inc.	John Deere Canada ULC
AltaGas, Ltd.	Keyera Corp.
Capital Power Corporation	Lassonde Industries, Inc.
Colas Canada, Inc.	SaskPower
Deschênes Group Inc.	Sonepar Canada Inc.
Emera, Inc.	Stantec, Inc.
EPCOR Utilities, Inc.	TC Transcontinental
Generac Power Systems	Tourmaline Oil Corp.
Hudbay Minerals Inc	TransAlta
Hydro One, Inc.	Valero Energy, Inc.
Inter Pipeline, Ltd.	Vale Canada Limited
Linamar Corporation	Vermilion Energy, Inc.

Appendix B

Mercer worked closely with THESL to select jobs that best represent the total employee population across the different job levels in the organization. The following 47 non-bargaining positions were included within the scope of the review:

THESL Position	Grade	THESL Position	Grade
Director, Capital Projects	Y3	EHS Consultant	V3
Director, Design & Construction	Y3	Employee Labour Relations Consultant	V3
Controller	Y3	Senior Commercial Services Counsel	V3
Director, Internal Audit & Compliance	Y3	Regulatory Affairs Consultant	V3
Director, Environment, Health and Safety	Y3	Senior Financial Analyst	V2
Director, Commercial Legal Services	Y3	Training Design Consultant	V2
Senior Manager, Customer Support Centre	Y1	Program Management Consultant	V2
Senior Manager, Finance Systems	Y1	Enterprise Risk Management Consultant	V2
Senior Manager, Change Management	Y1	External Communications Specialist	V2
Senior Manager, Warehouse Mgmt & Fleet Services	Y1	Capital & Maintenance Program Analyst	V1
Senior Manager, Regulatory Services	Y1	Asset Investment Analyst	V1
Senior Manager, Litigation & Privacy	Y1	Governance Counsel	V1
Manager, Finance Management Reporting	W4	Talent Management Associate	V0
Manager, Engineering	W4	Financial Analyst	V0
Manager, Project Execution	W3	HR Systems Associate	V0
Manager, Design	W3	Payroll & Disbursements Analyst	U2
Manager, Construction & Maintenance	W3	Executive Assistant	U2
Manager, Facilities	W3	Law Clerk, Litigation	U2
Manager, Supply Chain Services	W3	Operations Analyst	U1
Manager, Accounts Receivable Operations	W2	HR Analyst	U1
Manager, Call Centre	W2	Communications Coordinator, Customer Operations	U1
Manager, Capital Construction Analytics	W2	Human Resources Administrator	T1
IT Architect	V4	Human Resources Administrator	T1
Audit & Compliance Consultant	V3		

The following 14 bargaining positions were included within the scope of the review:

THESL Position	Union	THESL Position	Union
IT Client Consultant	SIT	Cert Crew Leaders, Power Line Tech	PWU
IT Technical Support Analyst	SIT	Distribution System Technologist	PWU
IT Technical Consultant	SIT	Power System Controller	PWU
Engineer	SE	Fleet Mechanic	PWU
Cert Meter Mechanic	PWU	Engineering Technologist Level 1	PWU
Programmer / Analyst	PWU	Engineering Technologist Level 2	PWU
Power Line Technician	PWU	Customer Relationship Representative	PWU



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1 **SHARED SERVICES AND CORPORATE COST ALLOCATIONS**

2

3 **1. OVERVIEW**

4 This schedule provides information about shared services and corporate cost allocations
5 between Toronto Hydro and the affiliated corporate entities described below:

6

7 • **Toronto Hydro Corporation (“THC”)**: THC provides strategic direction, corporate
8 governance, and financial stewardship to Toronto Hydro and Toronto Hydro
9 Energy Services Inc. (“TH Energy”). Toronto Hydro is wholly-owned by THC. THC
10 receives shared corporate services from Toronto Hydro and provides such services
11 to Toronto Hydro as described below.

12

13 • **TH Energy**: TH Energy’s primary line of business is the provision of street lighting
14 and expressway lighting services to the City of Toronto. TH Energy receives shared
15 corporate services from Toronto Hydro.

16

17 For more information about these entities and their relationship to Toronto Hydro, please
18 refer to Corporate Structure and Governance evidence at Exhibit 1C, Tab 2, Schedule 1.

19

20 This schedule also provides information about corporate cost allocations to the non-rate
21 regulated aspects of Toronto Hydro’s business (referred to as “THESU”), including climate
22 advisory services and generation activities.

1 **2. OEB APPENDIX 2-N**

2 A completed copy of OEB Appendix 2-N is filed at Exhibit 4, Tab 5, Schedule 2. This
3 appendix provides cost information and allocation details relating to each shared service
4 provided or received by Toronto Hydro in the historical years (2020-2022), bridge years
5 (2023-2024), and forecast years (2025-2029). Board of Directors-related costs included
6 in THC's cost allocation to Toronto Hydro is also shown in this appendix.

7

8 **3. SHARED SERVICE MODEL**

9 Toronto Hydro's shared services methodology has not changed since the utility's last
10 rebasement application.¹

11

12 Each service transaction is reviewed to determine the costing formula and method of
13 allocation. In establishing the price of a service transaction, Toronto Hydro follows the
14 Affiliate Relationships Code ("ARC"). The ARC provides for the use of fully allocated cost-
15 based pricing ("CBP") for shared corporate services and the use of fair market value
16 ("FMV") where a reasonably competitive market exists. If market price can be
17 determined, Toronto Hydro charges the higher of fully-allocated cost or market price for
18 any non-shared corporate services that it provides to the affiliated entities, and pays the
19 lower of fully-allocated cost or market price for any such services that it receives from the
20 affiliated entities.

21

22 If a competitive market does not exist, Toronto Hydro uses fully-allocated cost-based
23 pricing, which includes direct costs, indirect costs, and cost of capital, to determine the
24 cost of providing or receiving the non-shared corporate service.

¹ EB-2018-0165, Exhibit 4A, Tab 5, Schedule 1.

1 With regard to these fundamental principles and historical information about the
 2 quantity of services provided, Toronto Hydro assesses the approximate annual cost of
 3 each service. At the end of the fiscal year, the estimated cost of providing or receiving
 4 each service is reconciled with the actual cost and any differences are settled.

5

6 Table 1 below provides a description of Toronto Hydro’s corporate cost allocators by each
 7 functional service.

8

9 **Table 1: Shared Corporate Services Primary Allocation Drivers**

Functional service	Allocator	Reason
Finance (other than payroll, accounts payable, insurance)	Time allocation	Financial support, analysis, planning, calculations, and reports are more labour intensive for certain affiliates than others.
Finance – Payroll	Headcount	Amount of required payroll services, such as processing, is dependent on the number of employees.
Finance – Accounts Payable	Number of Invoices	Amount of required accounts payable services, such as processing, is dependent on the number of invoices received.
Finance – Insurance	Usage proportion	Amount of required insurance is dependent on the coverage required.
Information Technology	By employee	Required equipment and IT services are dependent on the number of employees who need equipment/services.
Public, Legal and Regulatory Affairs	Time allocation	Legal and regulatory services, including services related to councillor administration and requests, are more labour intensive for some affiliates than others.
Human Resources, Environment and Safety (“HRES”) (other than Talent Management and Administration)	Headcount	Amount of required HR services, such as services related to compensation/benefits, is dependent on the number of employees.

Functional service	Allocator	Reason
HRES – Talent Management and Administration	New hires	Amount of required Talent Management services, such as hiring, is dependent on the number of new hires.
Supply Chain Service – Procurement	Number of purchase orders	Amount procured for each affiliate is dependent on the number of purchase orders.
Facilities Management	Square footage	Amount of building space required is measured in square feet.
Customer Care – Billing	Number of invoices	Amount of required accounts receivable services, such as processing is dependent on the number of invoices issued.
THC – CEO, CFO, Board of Directors	Time allocation	Services provided to certain affiliates are more labour intensive than others.

1

2 **4. VARIANCE ANALYSIS**

3 **4.1 THC**

4 Further to Appendix 2-N, Table 2 below provides a summary of the costs of shared
 5 services provided by and received by Toronto Hydro to or from THC. A variance analysis
 6 between 2020 actuals and 2025 test year amounts, as well as 2022 actuals and 2025 test
 7 year amounts are included after the table.

8

9 **Table 2: Summary of the Costs of Shared Services Provided by and Received by Toronto**
 10 **Hydro to/from THC (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Services Provided by Toronto Hydro	2.7	2.6	3.0	3.1	2.9	3.2	3.4	3.4	3.6	3.9
Services Recovered by Toronto Hydro	4.0	3.8	4.6	3.6	4.1	4.2	4.4	4.4	4.6	4.9

1 2020 Actual versus 2025 Test Year

- 2
- 3 • **Services Provided by Toronto Hydro:** The \$0.5 million variance between the 2020
4 actual and the 2025 test year is primarily attributable to higher estimated support
5 from the Finance and Public, Legal, and Regulatory programs to support corporate
6 risk and compliance functions.
 - 7 • **Services Received by Toronto Hydro:** The \$0.2 million variance from the 2020
8 actual and the 2025 test year is primarily due to higher expected stewardship costs
9 allocated to the regulated business.

10 2022 Actual versus 2025 Test Year

- 11
- 12 • **Services Provided by Toronto Hydro:** The \$0.2 million variance between the 2022
13 actual and the 2025 test year is due to higher estimated support from the Finance
14 and Public, Legal, and Regulatory programs to support corporate risk and
15 compliance functions.
 - 16 • **Services Received by Toronto Hydro:** The \$0.4 million variance from the 2022
17 actual and the 2025 test year is primarily due to lower expected stewardship costs
18 allocated to the regulated business.

19 **4.2 TH Energy**

20 Further to Appendix 2-N, Table 3 below provides a summary of the costs of shared
21 services provided by Toronto Hydro to TH Energy. A variance analysis between 2020
22 actuals and 2025 test year amounts, as well as 2022 actuals and 2025 test year amounts
23 are included after the table.

1 **Table 3: Summary of the Costs of Shared Services Provided by Toronto Hydro to TH**
 2 **Energy (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Services Provided by Toronto Hydro	1.6	2.6	2.1	2.3	2.4	2.4	2.6	2.7	2.8	3.2

3

4 2020 Actual versus 2025 Test Year

5 The \$0.8 million variance between the 2020 actual and the 2025 test year is primarily
 6 attributable to higher estimated expenditures to support streetlighting projects.

7

8 2022 Actual versus 2025 Test Year

9 The \$0.3 million variance between the 2022 actual and the 2025 test year is primarily
 10 attributable to higher estimated expenditures to support streetlighting projects.

11

12 **4.3 Non-Rate Regulated Toronto Hydro Activities**

13 Further to Appendix 2-N, Table 4 below provides a summary of the costs of shared
 14 services relating to Toronto Hydro’s non-rate regulated activities (e.g. climate advisory
 15 services and generation). A variance analysis between 2020 actuals and 2025 test year
 16 amounts, as well as 2022 actuals and 2025 test year amounts are included after the table.

17

18 **Table 4: Summary of the Costs of Services relating to Non-Rate Regulated Toronto**
 19 **Hydro Activities (\$ Millions)**

Segment	Actual			Bridge		Forecast				
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Services Provided by Toronto Hydro	1.5	1.7	1.6	2.0	2.5	2.8	2.4	2.4	2.5	2.6

1 2020 Actual versus 2025 Test Year

2 For non-rate regulated Toronto Hydro activities, the \$1.3 million variance between the
3 2020 actual and the 2025 test year is primarily attributable to higher estimated
4 expenditures to support climate advisory services.

5

6 2022 Actual versus 2025 Test Year

7 For non-rate regulated Toronto Hydro activities, the \$1.2 million variance between the
8 2022 actual and the 2025 test year is primarily attributable to higher estimated
9 expenditures to support climate advisory services.