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March 9, 2012

**VIA RESS, EMAIL and COURIER**

Ms Kirsten Walli  
Board Secretary  
Ontario Energy Board  
2300 Yonge Street, Suite 2700  
Toronto, Ontario, M4P 1E4

Dear Ms Walli:

**Re: Enbridge Gas Distribution Inc. ("Enbridge")  
Updated Interrogatory Responses  
Renewable Natural Gas Program Application ("Application")  
Ontario Energy Board ("Board") File Number EB-2011-0242**

Further to Enbridge and Union Gas Limited's Interrogatory Responses, submitted on February 24, 2012 and February 29, 2012, please find enclosed the updated interrogatory responses:

Exhibit I, Tab 5, Schedule 4, Attachment 1;  
Exhibit I, Tab 5, Schedule 4, Attachment 5;  
Exhibit I, Tab 5, Schedule 6, Attachment 1; and  
Exhibit I, Tab 12, Schedule 1.

This submission has been filed through the Board's Regulatory Electronic Submission System ("RESS"), and two hard copies will be sent to the Board via courier. Enbridge's filing for this proceeding can be found on the Enbridge website at:

[www.enbridgegas.com/ratecase](http://www.enbridgegas.com/ratecase).

If you have any questions, please contact the undersigned.

Sincerely,

*[Original Signed By]*

Lesley Austin  
Regulatory Coordinator, Regulatory Affairs

cc: Mr. F. Cass, Aird & Berlis LLP (via email and courier)  
All Interested Parties EB-2011-0242 (via email)

## Goulden, Bryan

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**From:** Goulden, Bryan  
**Sent:** February 15, 2011 10:13 AM  
**To:** Ydreos, Mel; Birmingham, Rick; Kitchen, Mark; Gibson, Matthew; Capps, Allen; Piett, Patti  
**Cc:** Seaward, Ed  
**Subject:** Biomethane Reference Price- Status Update

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

*Enclosed is a brief update on the status of this initiative that we are pursuing as a joint application with Enbridge. These updates will be provided on a regular basis to keep all of you informed of our progress in completing this application for submission to the OEB. If you have any questions or concerns please contact either Ed Seaward or me.*

*Thanks, Bryan*

Deliverable - to submit a joint application (with Enbridge Gas Distribution) to the OEB requesting a Biomethane Reference Price. This has been identified as a critical development where the Ontario gas utilities can lead in transforming the market by enabling the development of a viable Ontario industry for the injection of biomethane into the natural gas grid. This has significant strategic value to Union since it will allow for the development of a renewable natural gas supply stream as a complement to our existing fossil fuel supply: effectively "greening the gas grid".

Coordination with Enbridge – We have been coordinating this with Rob Fennell (Director Green Energy Strategy), Trevor MacLean (Director Business Development) and Norm Ryckman (Director Regulatory Applications). We are meeting on a bi-weekly basis to drive this process and ensure we continue to be aligned on our "ask" to the OEB.

Scope and Structure of the Application – the application will request approval of a long term, stable biomethane reference price that will be at a premium to our current WACOG. It will be considered as a "system gas supply stream" and be reflected in price through the current approved QRAM process. There will be a limit on the total volume of biomethane to be purchased in order to cap the price impact for Union's residential customers. Union and Enbridge will file concurrent applications with the OEB asking for approval of the price, term and the maximum volume/ rate impact provisions. The price that Union and Enbridge pay may be different to reflect different costs of dealing with these supply streams although the pricing and supply principles will be the same.

Application Timing – we estimate filing this application around June 2011.

Expert Witnesses – Union and Enbridge have agreed to retain two "experts" to validate our evidence on the need for a biomethane reference price and the actual reference price to be paid. These experts are Salim Abboud of the Alberta Research Council and Eric Camirand of Electigaz Technologies in Trois Rivieres, Quebec. Scope of work, contract details and validation of their suitability as "expert witnesses" is in progress. Our final proposed reference price, contract term and maximum volume/rate impact will not be known until these consultants finish their work (in late April).

Stakeholder Consultation/ Advocacy – Three general stakeholder constituencies have been identified and a separate consultation approach will be taken with each:

- Traditional regulatory intervenors
- Interested Government Agencies
- Interested Biomethane industry Stakeholders

We are developing a target list and communications strategy with Enbridge. We will also be consulting with our Government Relations team (Matt) on advocacy strategy.

Key Differences with Enbridge – Enbridge agrees with Union that the most critical component of this application is to seek approval of the price and term of the reference price, as well as the approach to roll this into the utility WACOG price, with appropriate limitations on supply quantity and customer impact. However they continue to have a broader interest in potentially seeking other approvals that will broaden the scope of this application. For example they have only slightly lessened their interest in seeking approval to ratebase biomethane cleanup assets and possibly entire biomethane projects. They now recognize that this will be an “uphill battle” with the OEB if they seek these broad approvals but they haven’t yet discarded this thinking. They also believe they may need to develop a “biomethane injection rate” similar to Union’s M13 service to allow developers to sell their product to others at a market hub like Dawn.

## **Goulden, Bryan**

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**From:** Goulden, Bryan  
**Sent:** March 15, 2011 4:39 PM  
**To:** Ydreos, Mel; Birmingham, Rick; Kitchen, Mark; Capps, Allen; Piatt, Patti; Gibson, Matthew  
**Cc:** Seaward, Ed; Hockin, Karen; Passmore, Libby; 'Varga, Frank'  
**Subject:** Biomethane Reference Price- Status Update #2

*Enclosed is a brief update on the status of this initiative that we are pursuing as a joint application with Enbridge. These updates will be provided on a regular basis to keep all of you informed of our progress in completing this application for submission to the OEB. The last update was provided on February 15<sup>th</sup>. If you have any questions or concerns please contact either Ed Seaward or me.*

*Thanks, Bryan*

Deliverable - to submit a joint application (with Enbridge Gas Distribution) to the OEB requesting a Biomethane Reference Price. This has been identified as a critical development where the Ontario gas utilities can lead in transforming the market by enabling the development of a viable Ontario industry for the injection of biomethane into the natural gas grid. This has significant strategic value to Union since it will allow for the development of a renewable natural gas supply stream as a complement to our existing fossil fuel supply: effectively "greening the gas grid".

Coordination with Enbridge – We have been coordinating this with Rob Fennell (Director Green Energy Strategy), Trevor MacLean (Director Business Development) and Norm Ryckman (Director Regulatory Applications). We are meeting on a bi-weekly basis to drive this process and ensure we continue to be aligned on our "ask" to the OEB. Rob is leading this effort for Enbridge but is relying on Trevor's staff to assist him as he is a one person department.

Scope and Structure of the Application – most of the focus in the last month has been getting the hiring of the experts underway and sorting out details of the stakeholder advocacy plan. Union and Enbridge have agreed that we will purchase a maximum of 2% of our System Supply portfolio as biomethane. This will limit the residential customer impact to less than \$20 per year. Enbridge had initially wanted to cap this supply at 5% of System supply. The \$20 per residential customer maximum impact will only occur when the full 2% supply cap is reached and assuming WACOG remains at current levels. This biomethane supply target is realistically expected to take 3-5 years to achieve. Other details of the application evidence will be sorted out in the next few weeks.

Application Timing – there has been some slippage in this project, primarily due to delays in hiring the expert witnesses. We currently estimate filing this application sometime in June 2011.

Expert Witnesses – Union and Enbridge have now hired both experts but the process was very slow (a least from Union's perspective). Papering these contracts was delayed by about 3 weeks. These experts are Salim Abboud of the Alberta Research Council and Eric Camirand of Electigaz Technologies in Trois Rivieres, Quebec. The kick-off meeting with Electrigaz was held today in Toronto. The expected timing for completion of the work by both consultants is being worked out. Our final proposed reference price, contract term and maximum volume/rate impact will not be known until these consultants finish their work and this will affect our evidence completion date as well as some of our stakeholder outreach (for those stakeholders who are concerned about the actual proposed reference price).

Stakeholder Consultation/ Advocacy – Three general stakeholder constituencies have been identified and a separate consultation approach will be taken with each:

- Traditional regulatory intervenors
- Interested Government Agencies
- Interested Biomethane industry Stakeholders

The communications plans is being finalized and will be distributed when complete. Ontario government ministries to be contacted include Ministries of Energy, Environment, Agriculture and Municipal Affairs & Housing. Based on Matt

Updated: 2012-03-09 / EB-2011-0242 EGDI / EB-2011-0283 Union / I-5-4 / Attachment 1 / Page 4 of 37  
Gibson's guidance, we will speak to the policy, not political decision makers in these ministries. Most of these government advocacy sessions will be arranged on a joint basis with Enbridge, whenever possible.

We will also contact Frank Varga to coordinate our communication strategy with specific municipalities with an interest in biomethane. This includes Hamilton, Guelph, London and possibly a few additional municipalities. We hope to garner support for our application from at least a few municipalities.

Enbridge has been keen to engage in dialogue with individual regulatory intervenors on this proposal, prior to the price being finalized. We have discouraged this approach and have indicated we intend to have a session with all of our intervenors when we know the details of our proposal but have not yet filed any evidence. Enbridge are still working out their intervenor communication strategy.

Key Differences with Enbridge – Enbridge appears to have reduced their original appetite for a very broad scope in their biomethane application. Their treatment of connection costs is different than Union's. We will require all suppliers to pay the full costs of connection to our system (as we do with local suppliers) whereas Enbridge will pay the meter and regulator costs plus a running line allowance of approximately \$500K. Any costs in addition to this will be paid by the supplier. Union will also require the supplier to pay the costs of and assume full responsibility for gas quality monitoring equipment at the connection to our system (as with local production). Enbridge is interested in paying for (and ratebasing the costs of) the gas cleanup skid, at least for the first few installations to ensure that the technology works. These differences mean that the reference price Union pays will be different (and higher) than Enbridge since the capital costs (and related supplier obligations) of connecting to our system will be higher.

Despite these differences, we are more aligned than we initially were when Enbridge wanted to rate base all raw gas cleanup equipment for all installations. Enbridge has also discarded a previous notion they had that they would mitigate the premium price of the biomethane supply by selling it off to marketers. The most significant challenge we have had with Enbridge has been to keep this process moving forward at a reasonably aggressive pace. Despite this also being a priority for them they have been very challenged with moving this ahead.

Gas composition specification – Enbridge have recently indicated that they believe the biomethane gas composition specification needs to be tightened to allow for only trace amounts of oxygen due to some pipeline corrosion concerns. Union and TCPL's current supply has a 100-1000 ppm expected range of oxygen content. We are working with Enbridge to better understand their concerns that appear to be inconsistent with current "regular natural gas" supply that we receive.

#### Next Steps

- Manage the expert consultants' scope of work (Ed Seaward, Drew Everett)
- Finalize and circulate the advocacy plan (Bryan Goulden, Matt Gibson, Frank Varga)
- Develop detailed evidence outline and schedule and assign responsibilities (Bryan Goulden, Karen Hockin)
- Respond to Enbridge concerns regarding biomethane O2 composition (Bryan Goulden, Drew Everett)

## **Goulden, Bryan**

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**From:** Goulden, Bryan  
**Sent:** April 29, 2011 3:07 PM  
**To:** Ydreos, Mel; Birmingham, Rick; Kitchen, Mark; Capps, Allen; Piett, Patti; Gibson, Matthew  
**Cc:** Seaward, Ed; Hockin, Karen; Passmore, Libby; Varga, Frank  
**Subject:** Biomethane Reference Price- Status Update #3

*Enclosed is a brief update on the status of this initiative that we are pursuing as a joint application with Enbridge. These updates will be provided on a regular basis to keep all of you informed of our progress in completing this application for submission to the OEB. The last update was provided on March 15<sup>th</sup>. If you have any questions or concerns please contact either Ed Seaward or me.*

*Thanks, Bryan*

Deliverable - to submit a joint application (with Enbridge Gas Distribution) to the OEB requesting a Biomethane Reference Price. This has been identified as a critical development where the Ontario gas utilities can lead in transforming the market by enabling the development of a viable Ontario industry for the injection of biomethane into the natural gas grid. This has significant strategic value to Union since it will allow for the development of a renewable natural gas supply stream as a complement to our existing fossil fuel supply: effectively "greening the gas grid".

### Status

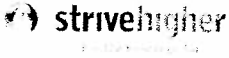
1. Experts: Union and Enbridge have engaged two experts to provide the following support for our application:  
*Alberta Innovates* – provide information on the Ontario market potential for Renewable Natural Gas (RNG), comparison of efficiency of using biogas for electric generation versus injection into the natural gas system, GHG reduction benefits of RNG. The first draft report has been received this week and this report will be finalized within the next few weeks.  
*Electricgaz* – provide information on the technology available and develop the cost model to support the appropriate reference price based on the capital and operating costs of different biomethane technologies. This work and the recommendations on specific reference prices will be available in the next few weeks.
2. Evidence: Union and Enbridge have exchanged preliminary evidence drafts. Scope of Enbridge's application is larger and more complex than Union's as they have included the need for approval of an RNG reference price but also the need for an injection rate within the Enbridge franchise to move the RNG around the system (like Union's M13). Enbridge also wants approval to ratebase "the first few" installed biogas cleanup facilities (Union's position is that this is unnecessary since there is viable technology available from reliable vendors already).
3. Stakeholder Consultation – we met with some environmental stakeholders this week. They included Jack Gibbons, Bernie McIntyre of the TRCA and Kai Millyard, although Kai didn't show up for the meeting. These intervenors were an easy sell on this proposal as they see all of the environmental benefits. Enbridge had originally intended to do a comprehensive round of consultation with Ontario government ministries before knowing details of the proposed reference price. They have now modified their plans to do this more quickly once the details of our proposed RNG reference price/ term are known. Consultation with municipal officials will commence shortly

Application Timing – based on the first draft evidence, Enbridge have a much broader view of the scope of the application and have not sorted out the details of some of the "extras" they want to include (for example the design of the injection rate). This uncertainty may cause them to scale back the scope of this application to be closer to Union's but they aren't there yet. We have informed them that Union will be challenged to complete the application, evidence and consultation before the end of June but still believe this is attainable. Enbridge also believes this can be achieved. During our meeting with Enbridge this week we also talked about our sense of the Board's receptiveness to receiving this application at this time. While there is speculation about the impact of the pending provincial election and the Board's recent attention to customer rate impacts we are both of the view that this application should be filed as soon as all of the necessary steps have been completed.

Key Differences with Enbridge – Enbridge’s current evidence draft has not specifically spoken to the public policy case to be made for approval of the RNG Reference price. Instead, this is contained within their large evidence package. Union’s proposed approach has been that the case for the RNG Reference price should be common evidence that both Union and Enbridge can file so that the case for approving this price is stronger and more focused. We continue to discuss the importance of a common approach on this with them but we are not there yet.


Next Steps

- Complete the expert consultants’ work (Ed Seaward, Drew Everett)
- Resolve the Enbridge/ Union evidence approach (Bryan Goulden)
- Develop detailed common and Union specific evidence (Bryan Goulden, Karen Hockin, Ed Seaward)
- Implement Stakeholder consultation plan when sufficient RNG reference details are available (Bryan Goulden, Ed Seaward, Matt Gibson, Frank Varga)
- Arrange Intervenor consultation meeting (Karen Hockin, Bryan Goulden)




**Biomethane (RNG) Pricing Initiative**

**Bryan Goulden**  
**Manager, Market Development**




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**RNG Pricing Program Overview**

- Planned joint Union/ Enbridge application to the OEB requesting approval of an Ontario RNG Supply Price to enable the development of a viable new market through purchase of this gas as part of our System Gas supply stream
- Jointly hired external experts to:
  - Complete market research to validate ratepayer interest/support
  - Confirm market potential and GHG impact of RNG
  - Develop an economic business model to recommend appropriate RNG purchase price
- Deals with an Ontario public policy issue that we can help “solve” while providing strategic value to Union Gas

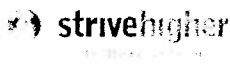
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## What is Renewable Natural gas (RNG)?




- As organic waste decomposes in the absence of oxygen, biogas is created
  - Process known as *anaerobic digestion*
- Anaerobic digestion happens naturally in landfills or can occur in an Anaerobic Digester system
  - Digesters proven technology worldwide
- Biogas is a valuable source of energy
  - Consists of ~60% methane and ~40% carbon dioxide
- Removal of CO<sub>2</sub> and impurities creates a gas that is interchangeable with conventional natural gas
  - Upgraded biogas is called RNG and can be added to Union's distribution or transmission supply stream

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## Sources of RNG

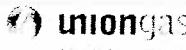


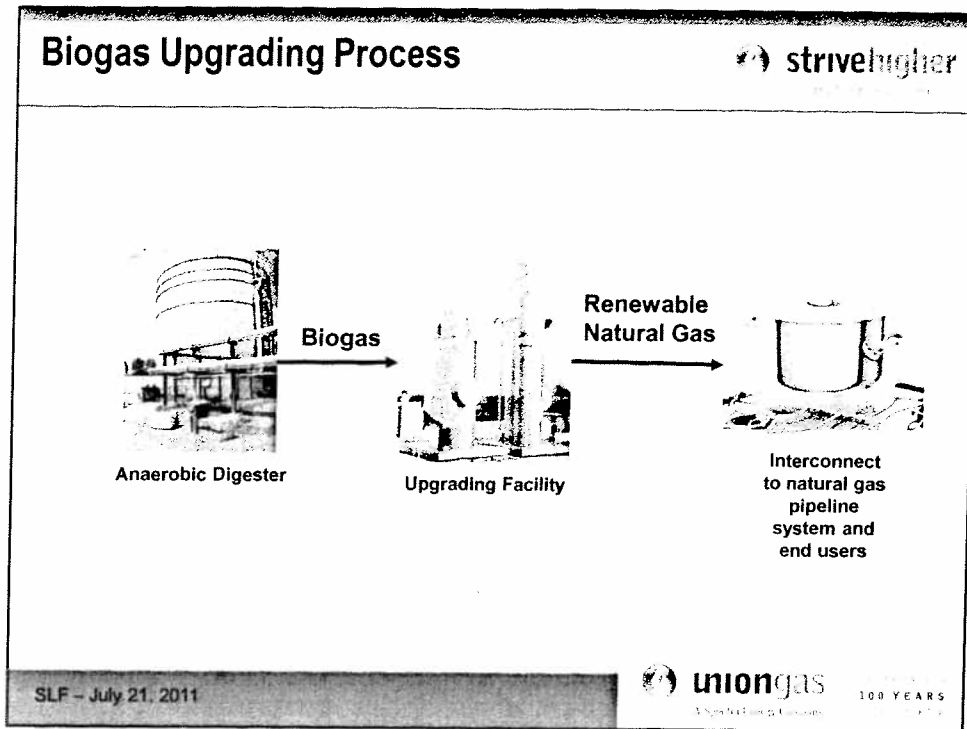
Anaerobic Digestion (AD)

- Agricultural manure/ crop residues
- Municipal wastewater Treatment Plants
- Municipal Source Separated Organics (e.g. Green Bin)
- Food processing waste (e.g. breweries, rendering plants)

Landfill Gas (LFG)


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- ### Benefits of RNG
- 
- strivehigher**  
2011-2012 Energy Excellence
- Multiple benefits of RNG
    - Reduces GHG emissions two ways
      - 1) Capturing lost methane 2) Offsetting natural gas
    - Provides a source of consistent, predictable and local supply
      - Renewable but not intermittent like wind and solar
    - Utilizes existing utility infrastructure and customer equipment
      - No behavioural change or end-user capital expenditures needed
    - Highly efficient use of raw energy source
    - Minimizes local waste problems (to create local energy source)
    - Stimulates regional development
- SLF – July 21, 2011
- uniongas**  
2011-2012 Energy Excellence  
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## Current Situation




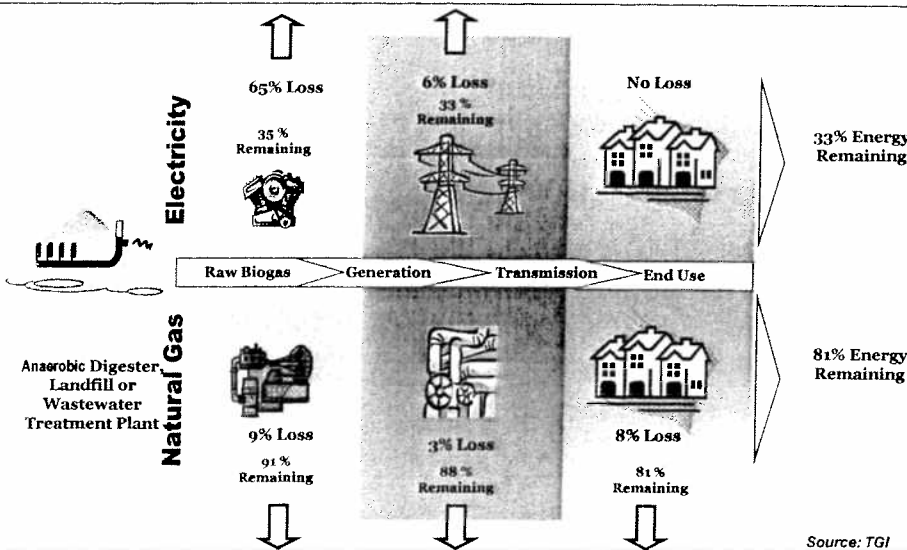
- No viable market exists for Ontario producers wanting to inject RNG into gas pipelines
  - Need fair prices, fixed-term contracts and supporting structure
- Many sites flare or vent the biogas into the atmosphere
  - Flaring: Missed opportunity to use energy productively and offset traditional energy sources
  - Venting: Methane has 21 times the GHG potency of CO2
- Other sites use biogas to generate electricity as part of OPA Feed-in-Tariff program

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## Efficiency of Biogas Options






Option	Raw Biogas	Generation	Transmission	End Use	Total Energy Remaining
<b>Electricity</b>	65% Loss 35% Remaining	6% Loss 33% Remaining	No Loss	No Loss	33% Energy Remaining
<b>Natural Gas</b>	9% Loss 91% Remaining	3% Loss 88% Remaining	8% Loss 81% Remaining	8% Loss 81% Remaining	81% Energy Remaining


Source: TGI

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2/7/2012


## RNG Supply Potential



- Potential RNG supply from all Ontario wastes
  - Total potential 4,435 M m3/yr – **18% of utility volumes**
    - Near term (anaerobic processes) – **6% of utility volumes**
    - Long term (gasification) – **12% of utility volumes**
- Potential GHG reductions from RNG production
  - Total potential in Ontario ~19 Mt CO<sub>2</sub> equivalent/yr
  - Near-term potential ~13 Mt CO<sub>2</sub> equivalent/yr
    - This is **48% of Ontario's 2020 emissions reduction target**
    - Equivalent to taking **2.5 million cars/yr** off road


(Source: EPA GHG Equivalencies Calculator)

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## RNG Program Features – Specified Prices



- Pricing principles
  - Manageable customer bill impact
  - Market transparency on all contract provisions
  - Ensure incremental gas supply costs are recovered from customers who benefit from the program
  - Prices paid reflect adequate ROI for producers

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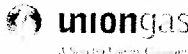
## RNG Program Features – Specified Prices

- Utilities pay producers specified prices for RNG, broken into categories reflecting their costs

Source / Size	Annual Breakpoint	Under Breakpoint	Over Breakpoint
Landfill	150,000 GJ	\$13/GJ	\$6/GJ
AD	50,000 GJ	\$17/GJ	\$11/GJ

- Calculations based on
  - Independent research and analysis
  - Seven different scenarios (3 landfills, 4 AD)
  - No specific technology favoured
- Producers pay utilities
  - 100% contribution in aid of construction for station, mains and connection assets, plus related O&M

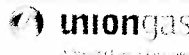
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## Why Utilities Should Play a Key Role in RNG

- Ontario gas utilities are in a unique position, through their gas supply portfolios, to add a RNG supply stream, and this market won't develop without utility involvement!
- Customers to receive a more sustainable product from their gas utility
- Complements existing Ontario public policy (i.e. GEA, Landfill Regulations, OMAFRA biogas program))

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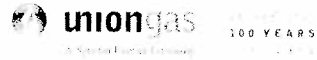

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## RNG Strategic Value to Union Gas



- Makes natural gas a part of the renewable energy discussion with policy-makers
  - Can play a significant role in solving the GHG emissions problem
  - Uses environmental waste issue to create energy
- We become part of the “green” solution, not the fossil fuel “problem”.

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**Goulden, Bryan**

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**From:** Goulden, Bryan  
**Sent:** July 22, 2011 3:25 PM  
**To:** Birmingham, Rick; Kitchen, Mark; Hockin, Karen; Capps, Allen; Piett, Patti; Evers, Mary; Ydreos, Mel; Seaward, Ed  
**Subject:** Preparation Material for RNG meeting - Monday July 25, 1pm

Attached is the material to be discussed at Monday's Renewable Natural Gas Initiative meeting. The agenda for Monday's meeting is shown below. Mel is planning to call-in to this meeting.

Agenda for July 25<sup>th</sup> Meeting

1. High Level Review of RNG Application
2. Status of Evidence Preparation
3. Stakeholder Consultation Feedback
4. Timing for Submission to the OEB



RNG Status Report  
- Jul 25'11....

The presentation material provided to stakeholders during our consultation sessions is also attached for your information



RNG intervener  
presentation sp...

Thanks, Bryan

### Renewable Natural Gas Program – Application Summary

Objective: OEB approval of the cost consequences of a program to enable Ontario gas utilities (both Union and Enbridge) to facilitate the development of a viable market for RNG.

#### Application highlights

- Purchase of RNG supply at specified prices
  - For a fixed term
  - Within OEB-approved volume cap
  - Planning certainty for producers
  - Managing customer price impact at supported levels
  - Union/ Enbridge alignment on all issues
- 

#### Customer Rate Impact

- Ipsos Reid joint market research commissioned in late 2010 determined that 68% of residential and 62% of commercial customers support paying up to a 2% gas bill increase for RNG
- For residential customers this equates to \$18 per year based on current natural gas commodity rates
- RNG volume cap was determined based on this maximum \$18 per year cumulative impact for residential customers

#### Program Limits

- In order to manage to the maximum rate impact, the RNG volume to be purchased by the utilities will be capped at 65 million m<sup>3</sup> (2.4 PJ) for Union and 87 million m<sup>3</sup> (~3PJ) for Enbridge. Union's volume is further allocated as 1.9 PJ South and 0.5 PJ North. This calculation was made based on current QRAM prices, system gas volumes, etc... but will not be adjusted going forward.
- This program will expire when the volume cap is met or after 5 years, whichever occurs sooner.

#### RNG Financial Impact

- RNG supply will be a supply stream in the System Supply portfolio approved by the OEB as part of the existing approved QRAM process. System gas customers will pay the RNG premium
- In-franchise direct purchase customers and ex-franchise customers will not pay for RNG supply

#### Program Start Date

- January 1, 2012
-



RNG Supply Contract Terms

Price:

Source / Size	Annual Breakpoint	Under Breakpoint	Over Breakpoint
Landfill	150,000 GJ	\$13/GJ	\$6/GJ
AD	50,000 GJ	\$17/GJ	\$11/GJ

Term: 20 year supply contract with an escalator based on 30% CPI

GHG Credits: to be owned by the Utilities on behalf of their System gas Customers (who paid for them)


Parallels with OPA FIT contract design: assumes 11% ROE (same as FIT). Same overall approach taken in developing pricing model based on capital and operating costs of RNG production.

Producer Facilities Costs: all costs of tieing into the Union system (service, station,etc) and ensuring gas supply meets Utility's quality specifications are to be borne by the producer. This is consistent with the obligations of Union's existing local producers.

Producer Monthly Connection Fee : \$656 per month, as per Union's approved M13 contract rate schedule.

#### RNG Evidence Summary

- Application (Union Gas) – being drafted (Karen/ Emily)
- Common Evidence of Union/ Enbridge – final draft being reviewed by UGL/EGD Regulatory/Legal Counsel
- Customer Market Research (Ipsos Reid) – Complete
- RNG Market Potential Study (Alberta Innovates) – complete by July 31 (Ed)
- RNG Business Model and Pricing Study (Electrigaz) – complete by July 31 (Ed)
- Union Gas Specific Evidence including:
  - Rate impact details
  - Rationale for producer connection charges
  - RNG gas purchase agreement
  - Stakeholder support/ letters of intent
    - underway

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*Energy for Progress* 1912-2012

**ENBRIDGE**

1

**Renewable Natural Gas Application**  
*Stakeholder Presentation*

*For Discussion Purposes Only*

**UNION GAS & ENBRIDGE GAS DISTRIBUTION**

*Summer 2011*

*Without Prejudice* *Certain Figures Subject to Finalization*

**Renewable Natural Gas Meeting Agenda**

2

- Purpose of today's meeting
- Background on Renewable Natural Gas (RNG)
- Key program features
- The role of utilities
- Next steps
- Discussion

## Purpose of Today's Meeting

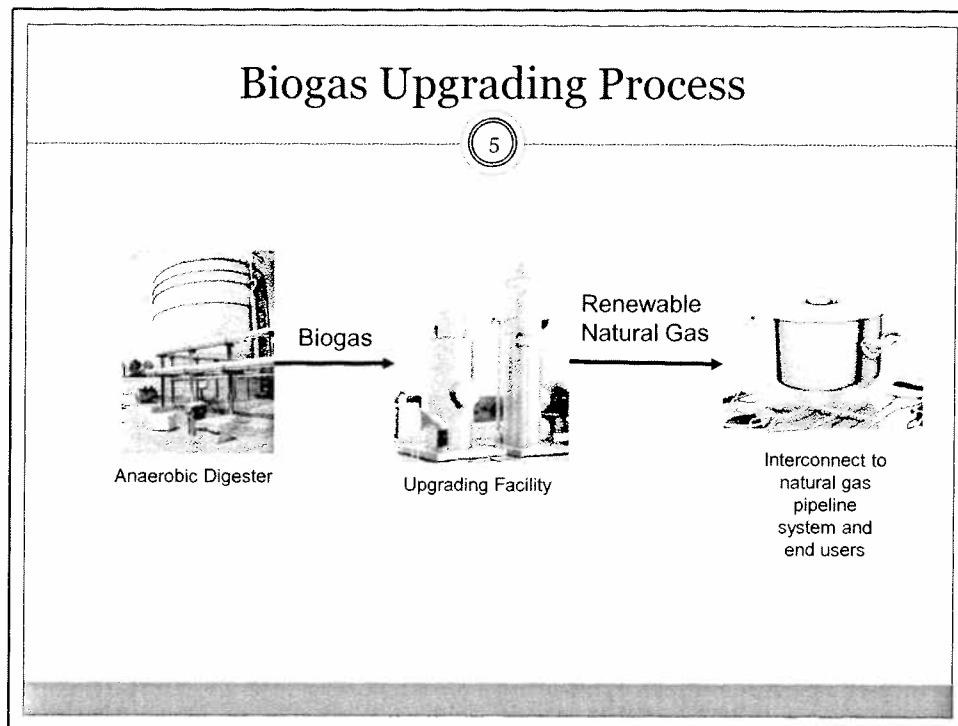
3

- Update on the Utilities' RNG applications to the OEB
  - Objective: OEB approval of the cost consequences of program that would enable Ontario gas utilities to facilitate the development of a viable market for RNG
- Application highlights
  - ✦ Purchase of RNG supply at specified prices
  - ✦ For a fixed term
  - ✦ Within OEB-approved volume cap
  - ✦ Planning certainty for producers
  - ✦ Managing customer price impact at supported levels

## What is RNG?

4

- As organic waste decomposes in the absence of oxygen, biogas is created
  - Process known as *anaerobic digestion*
- Anaerobic digestion happens naturally in landfills or can occur in an Anaerobic Digester system
  - Digesters proven technology worldwide
- Biogas is a valuable source of energy
  - Consists of ~60% methane and ~40% carbon dioxide
- Removal of CO<sub>2</sub> and impurities creates a gas that is interchangeable with conventional natural gas
  - Upgraded biogas is called Renewable Natural Gas (biomethane)



- ### Benefits of RNG
- 6
- **Multiple benefits of RNG**
    - Reduces GHG emissions two ways
      - 1) Capturing lost methane 2) Offsetting natural gas
    - Provides a source of consistent, predictable and local supply
      - Renewable but not intermittent like wind and solar
    - Utilizes existing utility infrastructure and customer equipment
      - No behavioural change or end-user capital expenditures needed
    - Highly efficient use of raw energy source
      - Exceeds efficiency of power generation from biogas
    - Minimizes local waste problems
      - Uses waste productively to create local source of energy
    - Stimulates regional development
      - Reduces disposal costs and increases opportunity for local investment

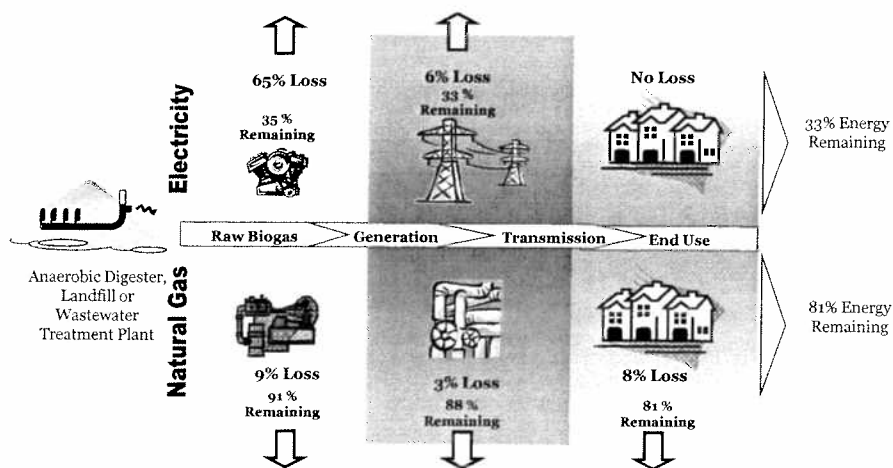
## Current Situation

7

- No viable market exists for Ontario producers wanting to inject RNG into gas pipelines
  - Need fair prices, fixed-term contracts and supporting structure
- Many sites flare or vent the biogas into the atmosphere
  - Flaring: Missed opportunity to use energy productively and offset traditional energy sources
  - Venting: Methane has 21 times the GHG potency of CO<sub>2</sub>
- Other sites use biogas to generate electricity as part of OPA Feed-in-Tariff program
  - Grid constraints may limit opportunities to connect
  - Biogas power generation is ~33% efficient if no use for waste heat

## Efficiency of Biogas Options

8



## RNG Supply Potential

9

- **Potential RNG supply from all Ontario wastes**
  - Total potential 4,435 M m<sup>3</sup>/yr – 18% of utility volumes
    - ✦ Near term (anaerobic processes) – 6% of utility volumes
    - ✦ Long term (gasification) – 12% of utility volumes
  
- **Potential GHG reductions from RNG production**
  - Total potential in Ontario ~19 Mt CO<sub>2</sub> equivalent/yr
  - Near-term potential ~13 Mt CO<sub>2</sub> equivalent/yr
    - ✦ This is 48% of Ontario's 2020 emissions reduction target
    - ✦ Equivalent to taking 2.5 million cars/yr off road

(Source: EPA GHG Equivalencies Calculator)

## RNG Program Overview

10

- **Key Features**
  - RNG prices that exceed current price of natural gas
  - Long-term contracts
  - Capped volume or program ends after 5 yrs
  - Managed customer bill impact
  - Supporting structure

## RNG Program Features – Specified Prices

11

- **Rationale for RNG prices**
  - Cost to create RNG currently greater than the market price of natural gas
  - Volatile nature of natural gas prices and short-term supply contracts restrict market-based RNG
- **RNG prices would be reflected in the current approved Quarterly Rate Adjustment Mechanism**
  - Constitute another supply stream

## RNG Program Features – Specified Prices

12

- **Pricing principles**
  - Manageable customer bill impact
  - Market transparency on all contract provisions
  - Ensure incremental gas supply costs are recovered from customers who benefit from the program
  - Prices paid reflect adequate ROI for producers



### RNG Program Features – Specified Prices

13

- Utilities pay producers specified prices for RNG, broken into categories reflecting their costs

Source / Size	Annual Breakpoint	Under Breakpoint	Over Breakpoint
Landfill	150,000 GJ	\$13/GJ	\$6/GJ
AD	50,000 GJ	\$17/GJ	\$11/GJ

- Calculations based on
  - Independent research and analysis
  - Seven different scenarios (3 landfills, 4 AD)
  - No specific technology favoured
- Producers pay utilities
  - 100% contribution in aid of construction for station, mains and connection assets, plus related O&M

### RNG Program Features – Long Term Contracts

14

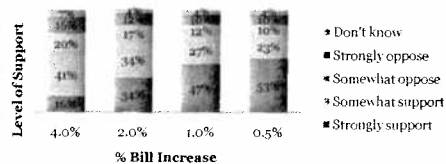
- Key contract elements
  - Fixed-term contract of 20 years
  - Equitable network access per allocation process
  - Take-away capacity determined by network analysis
- Rationale
  - Offers planning certainty to producers
  - 20-year contracts available today for renewable power generation
  - Customers benefit if price of natural gas exceeds RNG

## RNG Program Features – Limited Customer Impact

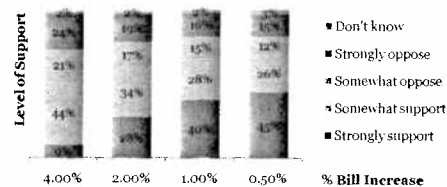
15

- Mindful of need to balance market/customer impact
  - Customer survey results demonstrate support
- Cost Allocation
  - Commodity to be paid by system gas customers only
  - No impact on T-service or direct purchase customers
- All environmental attributes will belong to customers

### Residential Customer Support



### Commercial Customer Support



## RNG Program Features – Supply Volume Cap

16

- Utilities will limit RNG supply volumes
  - Volume cap guided by residential customer impact
  - Program will cease when cap is met or after five years
- Cap on RNG supply and specified RNG prices allow us to determine customer bill impact
  - Average residential customer maximum bill impact approximately \$18
- We estimate it will take several years to reach cap
  - Therefore rate impacts small and gradual

## RNG Program Features – Supporting Structure

17

- RNG supply allocation process
  - Access based on seasonal take-away capacity
  - First come, first-served basis
  - Producers given 12 months to commit their projects
  - Open to third-party contracting
  
- RNG quality specifications
  - Pipeline safety and integrity are our focus
  - RNG quality standards meet CGA guidelines
  - Producers must meet quality standards or injection prevented

## Why Utilities Should Play a Key Role in RNG

18

- Ontario gas utilities are in a unique position, through their gas supply portfolios, to add a RNG supply stream
- Customers to receive a more sustainable product from their gas utility
- Customers wanting 0% or 100% RNG will have option to purchase supply from marketers
- Complements existing Ontario public policy

## Application Supports Ontario Public Policy

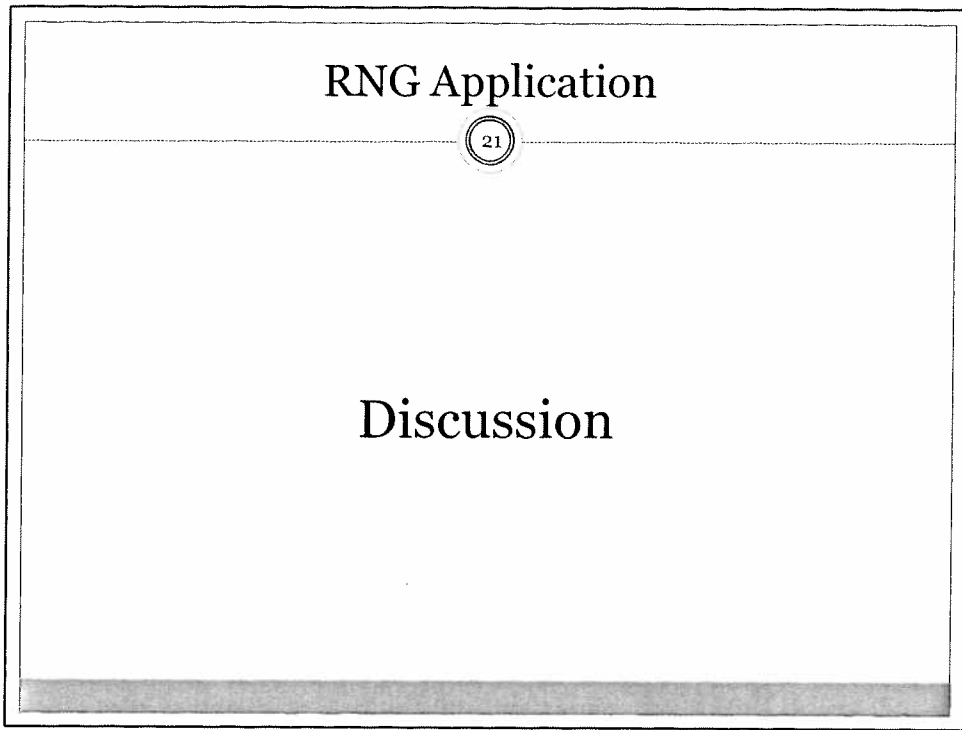
19

- **Related Policies:**
  - **Ministry of Environment: Ontario Climate Change Action Plan**
    - ✦ June 2008: Landfills emitting in excess of 1.5 million m<sup>3</sup> required to capture gas
    - ✦ GHG emission reduction targets of 6% by 2014; 15% by 2020 and 80% by 2050 (based on 1990 levels)
  - **OMAFRA: Biogas Financial Assistance Program**
    - ✦ September 2008 – March 2010: Funding for biogas industry projects
  - **Ministry of Energy: Green Energy Act, May 2009**
    - ✦ Fostering growth of renewable energy projects
    - ✦ Removing barriers to renewable energy
    - ✦ Promoting a green economy

## RNG Program: Next Steps

20

- **Stakeholder meetings: July 2011**
- **Application to be filed with OEB: Summer 2011**
- **Target date for program launch: January 1, 2012**



## **Goulden, Bryan**

---

**From:** Goulden, Bryan  
**Sent:** October 4, 2011 1:31 PM  
**To:** Capps, Allen; Gibson, Matthew; Boyd, Lindsay  
**Cc:** Birmingham, Rick; Ydreos, Mel; Piett, Patti; Kitchen, Mark; Hockin, Karen; Seaward, Ed  
**Subject:** FW: EB-2011-0283 Union - Renewable Natural Gas Application filed Friday

For your information. The next step in the process is to wait for the Ontario Energy Board to determine what process they wish to follow to deal with this. There was a great deal of teamwork required at Union to pull this application together and all of the employees listed below ( and of course the Regulatory group) contributed in a significant way. We have a great team! And we have continued to work well together with Enbridge to make this happen.

Please let me know if you require any additional details,

Bryan

---

**From:** Hockin, Karen  
**Sent:** October 3, 2011 4:09 PM  
**To:** Vince, Karen; Byng, Tom; Maslen, Gary; Evers, Mary; Goulden, Pamela; Piett, Patti; Jones, Dan  
**Cc:** Goulden, Bryan; Seaward, Ed; Redford, Marian; Ripley, Chris; Thebeau, Michele; Clark, Joanne  
**Subject:** EB-2011-0283 Union - Renewable Natural Gas Application filed Friday

Good afternoon.

Union and Enbridge filed their RNG applications and evidence Friday September 30<sup>th</sup> .

Union's submission can be found on our website at:

<http://www.uniongas.com/aboutus/regulatory/ratecases.asp>

Enbridge's submission (EB-2011-0242) is available on their external website at :

<https://www.enbridgegas.com/about/regulatory-affairs/>

( note –the bulk of the evidence is jointly submitted, with separate applications, and separate Exhibit C sections – Utility specific evidence on bill impact and monthly charges.

Enbridge's website currently has it under EB-2011-0241 – this reference will be updated)

Thank you for your support in developing this submission. Let me know if you require any additional information.

Karen Hockin

---

**From:** Hockin, Karen  
**Sent:** September 30, 2011 5:41 PM  
**To:** david.butters@appro.org; cconway@bomatoronto.org; jgirvan@ca.inter.net; rwarren@weirfoulds.com; jim.gruenbauer@kitchener.ca; vderose@blg.com; paul.clipsham@cme-mec.ca; pthompson@blg.com; dwaque@comsatec.com; ric.forster@directenergy.com; daveduggan@ecng.com; EGDRegulatoryProceedings@enbridge.com; Rob.Fennell@enbridge.com; Owen.Schneider@enbridge.com; Edith.Chin@enbridge.com; Lyne.mcmurchie@enbridge.com; fcass@airdberlis.com; DavidMacIntosh@nextcity.com; drquinn@rogers.com; ian.mondrow@gowlings.com; mnewton@igua.ca; jfstacey@interlog.com; nruzycski@justenergy.com; randy.aiken@sympatico.ca; vyoung@aegent.ca; lynne.anderson@ontarioenergyboard.ca; colin.schuch@ontarioenergyboard.ca; neil.mckay@ontarioenergyboard.ca; barbara.reuber@opg.com; murray.klippenstein@klippensteins.ca; basil.alexander@klippensteins.ca; jgibbons@pollutionprobe.org; wmcnally@opsba.org; jay.shepherd@canadianenergylawyers.com; paul.kerr@shell.com; nick@sixnatgas.com;

Updated: 2012-03-09 / EB-2011-0242 EGDI / EB-2011-0283 Union / I-5-4 / Attachment 1 / Page 30 of 37  
murray\_ross@transcanada.com; jim\_bartlett@transcanada.com; transcanada\_mainline@transcanada.com; Kitchen,  
Mark; Goulden, Bryan; jclark@uniongas.com; Seaward, Ed; UNIONRegulatoryProceedings; mbuonaguro@piac.ca;  
jwightman@econanalysis.ca; rhiggin@econanalysis.ca; Smith, Alexander; eric\_nadeau@transcanada.com;  
jfarquharson@blgcanada.com; Robert ROWE; sbrown@justenergy.com; gpotter@justenergy.com;  
nogbue@justenergy.com; alan.cherkas@shell.com  
**Cc:** bhanjiz@lao.on.ca; tom.heintzman@bullfrogpower.com  
**Subject:** EB-2011-0283 Union - Renewable Natural Gas Application

Please find attached Union Gas Limited's ("Union") application and evidence seeking approval to establish a Renewable Natural Gas Program.


This document has been filed in the OEB RESS and two paper copies will be sent to the Board Secretary.

**Karen Hockin** P. Eng.  
Manager Regulatory Initiatives  
Union Gas Limited | A Spectra Energy Company  
50 Keil Drive North | Chatham, ON N7M 5M1  
**Tel: 519-436-5473**  
**Fax: 519-436-4641**

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A Spectra Energy Company

## Creating a Biomethane Pricing Mechanism

**Ed Seaward**  
*Manager, Market Opportunity Development*

*October 7, 2010*


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### Background: Sources of Biogas

- Biogas is created through anaerobic digestion of organic material
- Landfill Gas—naturally occurring process
- Digester Gas—3 business models developing
  - On-farm
  - Municipal or Commercial Aggregation of waste
  - Waste Water Treatment Plants
- In Ontario, to date, all digester gas has been utilized to generate power and sell to the OPA
  - Renewal Energy Standard Offer Program (RESOP)—prior to 2009
  - Feed-in-Tariff (FIT)—since 2009




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### Background: Biomethane

- Biogas/landfill gas is being upgraded to produce biomethane in many parts of the world utilizing existing, commercially available technology
- At Union Gas, biomethane will be required to meet the same natural gas standards as local producer wells
- Developing biomethane is not a technology issue, it is a market issue: the cost to create biomethane is greater than the current market price of natural gas

3


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### Why Should Union Gas Create A Pricing Mechanism?

- World is moving to a lower carbon future
  - Natural Gas is a fossil fuel
- Greening the image of natural gas
  - Biomethane is renewable energy
- Biomethane will not develop in Ontario without a pricing mechanism
  - The current low, volatile price of natural gas restricts market based biomethane
- An active role by Union Gas can strengthen our brand by demonstrating environmental leadership as “enablers”

4


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## Options for Biomethane Development

- Wait for the Ontario Government
  - Let the MOE/OPA create a feed-in-tariff
- Wait for Energy Marketers to develop the market
  - Bullfrog Power is interested
- Create a biomethane business for Union Gas
  - Own & operate infrastructure such as the clean up technology
- Enable the development of the green gas market by creating a pricing mechanism
  - Purchase biomethane as part of our system gas supply portfolio


5

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## Recommended Option

- Establish a price for biomethane
  - Purchase as part of Union's system gas supply portfolio
  - Set limits on amount of biomethane we will purchase
    - Commit to no more than 2% of portfolio (2.7 PJs)
    - This will ensure a predictable and minimum rate impact
  - Explore potential of strategic purchase arrangements
    - Bullfrog Power or other energy marketers
- Reasons:
  - Strengthen the Union Gas brand through environmental leadership
  - Being ahead of government allows us a measure of control as the market develops over time


6



### Current OPA Feed-in-Tariff Pricing for Biogas

Source	Output	F.I.T. Rate	Injection Output Translation	Injection F.I.T. Translation
Biogas (on-farm)	≤ 100 kW	19.5 ¢/kWh	≤ 9,000 GJ/yr	\$ 19.0 / GJ
	> 100 kW ≤ 250 kW	18.5 ¢/kWh	> 9,000 GJ/yr ≤ 22,500 GJ/yr	\$ 18.0 / GJ
Biogas	≤ 500 kW	16.0 ¢/kWh	≤ 45,000 GJ/yr	\$ 15.8 / GJ
	> 500 kW ≤ 10 MW	14.7 ¢/kWh	> 45,000 GJ/yr ≤ 900,000 GJ/yr	\$ 14.3 / GJ
	> 10 MW	10.4 ¢/kWh	> 900,000 GJ/yr	\$ 10.1 / GJ
Landfill gas	≤ 10 MW	11.1 ¢/kWh	≤ 900,000 GJ/yr	\$ 10.8 / GJ
	> 10 MW	10.3 ¢/kWh	> 900,000 GJ/yr	\$ 10.0 / GJ

7




### Pricing Recommendations for Union Gas


Source	Output	Biomethane Value (\$/GJ)
Biogas (from an anaerobic digester)	First 100,000 GJ/yr	\$ 15
	Over 100,000 GJ/yr	\$ 11
Landfill gas	First 100,000 GJ/yr	\$ 12
	Over 100,000 GJ/yr	\$ 8

- Adapted the OPA FIT Model
  - Similarities:
    - Guaranteed 20 year contract
    - Presumed ability for producer to earn 11% return (they want higher)
  - Differences:
    - Allow producers to retain ownership of carbon credits
    - Revised output categories


8

10/02/2012

 <b>uniongas</b> <small>A Spectra Energy Company</small>
<h3>Potential Risks</h3> <ul style="list-style-type: none"><li>• <b>Regulatory Risk</b><ul style="list-style-type: none"><li>– OEB does not see “enabling” as a role of the utility</li></ul></li><li>• <b>Customer Pushback</b><ul style="list-style-type: none"><li>– Negative media on electric rate impacts linked to OPA FIT<ul style="list-style-type: none"><li>• By setting clear limits on supply Union Gas can quantify the minimal rate impact for our gas customers</li></ul></li></ul></li><li>• <b>Biogas Developer Pushback (especially farmers)</b><ul style="list-style-type: none"><li>– Unlikely individual farms can develop biomethane at our recommended price, unlike OPA FIT<ul style="list-style-type: none"><li>• We will engage in proactive communication with the community through OMAFRA and encourage alternate business models for farms, such as Co-op approach</li></ul></li></ul></li></ul>
9

 <b>uniongas</b> <small>A Spectra Energy Company</small>
<h3>Potential Risks</h3> <ul style="list-style-type: none"><li>• <b>Energy Marketer Pushback</b><ul style="list-style-type: none"><li>– Union Gas viewed as competing with Energy Marketers for emerging business</li></ul></li><li>• Our willingness to be open to strategic relationships for purchase agreements can reinforce our role as “enablers” rather than competitors</li><li>• <b>Local Gas Producer Pushback</b><ul style="list-style-type: none"><li>– Issue of paying a premium price</li></ul></li><li>• Union's willingness to purchase biomethane can be interpreted as an “obligation to connect”<ul style="list-style-type: none"><li>– Firm guidelines around capital costs and ability to take gas away</li></ul></li></ul>
10


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## Potential Risks

- Impact of doing nothing
  - Environmental impact
  - Perception/brand, especially as other natural gas utilities in Canada move forward but not Union Gas

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## Next Steps

- Confirm Regulatory Approach:
  - Reach agreement with Enbridge (see update slide)
  - Stand alone application to the OEB
  - Write evidence
  - Meet OEB's process—written or oral
  
- Establish supporters for regulatory filing
  - Confirm general acceptance of recommended price

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## Enbridge Biomethane Update (Oct. 5, 2010)

- Enbridge agrees with Union on strategic importance of biomethane
- They agree on purchase price mechanism as the critical “enabler”
- They agree on need for alignment between Union & Enbridge before OEB
- Enbridge wants opportunity to invest in biomethane projects and receive the premium purchase price
- Enbridge differs in that they want to rate-base interconnect (as opposed to Union's “aid to construct” approach)

A large, curved banner image spans the top of the page. It depicts a landscape with several white wind turbines on a green field under a blue sky with white clouds. A single tree is visible in the foreground. The banner is bordered by a thick red curve on the left side.

# Renewable Natural Gas Regulatory Application

SMT Presentation

Updated: 2012-03-09  
EB-2011-0242 EGDI  
EB-2011-0283 Union  
I-5-4  
Attachment 5  
Page 1 of 12

*October 17, 2011*

# RNG Application Background

- Developed in conjunction with Union Gas
  - Both utilities filed September 30, 2011

COMMON	EGD SPECIFIC
Evidence	Table of Contents
Customer Survey	Application
Supply Report	RNG Bill Impact & Volume Cap
Pricing and Costing Reports	RNG Producer O&M Charge
Letters of Support	RNG Illustrative Example



# RNG Application Background

- The Regulatory ‘Ask’

OEB approval of the cost consequences of program that would enable Ontario gas utilities to facilitate the development of a viable market for RNG

- EGD Objective

To facilitate a market for RNG in Ontario as a defensive strategy to enhance the sustainability of the core product we deliver

# What is RNG?

- Biogas created as organic waste decomposes in absence of oxygen
  - Process known as *anaerobic digestion*
- Anaerobic digestion happens naturally in landfills or can occur in an Anaerobic Digester system
  - Digesters are proven technology worldwide
- Biogas is a valuable source of energy
  - Consists of ~60% methane and ~40% carbon dioxide
- Removal of CO<sub>2</sub> and impurities creates a gas that is interchangeable with conventional natural gas
  - Upgraded biogas called Renewable Natural Gas (biomethane)

# Benefits of RNG

- Reduces GHG emissions two ways
  - 1) Capturing lost methane 2) Offsetting natural gas
  - Methane has 21 times the GHG potency of CO<sub>2</sub>
- Existing utility infrastructure and customer equipment
  - No behavioural change or end-user capital expenditures needed
- Highly efficient use of raw energy source
  - Exceeds efficiency of power gen from landfill gas (81% vs. 33%)
  - Another option for producers facing grid constraints

# Benefits of RNG

- Provides a source of consistent, predictable supply
  - Renewable but not intermittent like wind and solar
- Minimizes waste local issues
  - Uses waste productively to create local source of energy
  - Alternative to flaring or venting to atmosphere
- Stimulates regional development
  - Reduces disposal costs and increases opportunity for local investment
  - Keeps gas supply dollars in the province

# RNG Supply Potential

- **Potential RNG supply from all Ontario wastes**
  - Total potential 4,435 M m<sup>3</sup>/yr. – 18% of utility volumes
    - Near term (< 10 yrs) anaerobic processes – 6% of utility volumes
    - Long term (10 yrs +) gasification – 12% of utility volumes
- **Potential GHG reductions from RNG production**
  - Near-term potential ~13 million tonnes CO<sub>2</sub>e/yr.
    - This is 48% of Ontario's 2020 emissions reduction target

# RNG Program Highlights

- EGD's annual volume cap & bill impact
  - 87 million m<sup>3</sup> (<1.5% of EGD system gas supply)
  - Goal: manage residential customer bill impact to supported levels
  - Bill impact of \$18/yr supported by 68% of customers surveyed
  - Our customers benefit if future price of NG exceeds RNG
  - 5 year contract-acceptance window
- Producers pay utilities
  - 100% capital contribution in aid of construction for stations, mains and connection facilities
  - Monthly O&M fee that includes fixed (M&R station) and variable (pipeline) charges

# RNG Program Highlights

- Purchase of RNG supply at specified prices, for up to 20 yrs
- Provide RNG producers with planning certainty
- RNG prices to cover producer costs, plus 11% ROE, plus escalator
- 20-yr contract term matches contract term available through FIT
- RNG prices designed to recognize sources and efficiencies of scale

Source	Annual Breakpoint	Under Breakpoint	Over Breakpoint
Landfill Gas	150,000 GJ	\$13/GJ	\$6/GJ
Anaerobic Digesters	50,000 GJ	\$17/GJ	\$11/GJ

- RNG prices to be reflected in QRAM
  - Impacts (and environmental credits) limited to system gas customers

# RNG Program Highlights

- **RNG supply allocation process**
  - Access based on seasonal take-away capacity
  - First come, first-served basis
  - Producers given 12 months to commit their projects
- **RNG quality specifications**
  - Pipeline safety and integrity are our focus
  - EGD's RNG quality standards meet CGA guidelines
  - Producers must meet quality standards or injection prevented



## RNG: Next Steps

- Application filed September 30, 2011
- Regulatory timelines difficult to predict
  - Little activity expected in October
  - Interrogatories and witness preparation will be next area of focus for team
  - Board decision likely in early 2012

# RNG Application

## Questions?

## Lyne McMurchie

---

**From:** Lyne McMurchie  
**Sent:** Thursday, November 25, 2010 4:06 PM  
**To:** bgoulden@uniongas.com; eseaward@uniongas.com; Rob Fennell; Trevor Maclean; Owen Schneider  
**Subject:** Biogas - Next Steps

Hello:

The following are deadlines and action items from today's meeting:

- Presentation revisions from today's meeting / Lyne / by Nov 30
- Presentation draft 2 review discussion / Lyne to set up conference call with Bryan, Trevor, Rob / Dec 2
- Presentation final approval / Rob and Bryan send presentation for senior-level review / Dec 6
- Presentation sent to OEB Legal Counsel / Bryan / Dec 8
- Presentation to Gas Committee / Bryan/Trevor/Rob plus Regulatory / Dec 15 at 2 p.m. for 45 minutes, including questions (Date to be confirmed by Bryan)
- Debrief after presentation, develop critical path Dec 16<sup>th</sup>, 1-2 p.m. (invite Regulatory)

Also:

-Deliverables by Nov 26 end of day:

- Union Logo (Bryan to Lyne )
- Bryan to send Lyne Mark's (Regulatory) email address for Dec 16 meeting
- Questions for Q&A (Bryan & Rob to Lyne )
- Request to go first on Dec 15<sup>th</sup> (Bryan via Mark / Rob via Norm)
- To send to Lyne:
  - National Grid – 14 Benefits Slide (?)
  - GHG diagram one unit of bio-methane offsets one unit of natural gas (Tim A / Andrew Y)
  - Terasen slide on efficiency vs. biogas for power generation (Received)
  - EON map on where they operate (Owen)
  - Additional digester pics, skid (Owen)
  - Process slide(Owen)
  - Waste from Energy Chart (?)

Thanks. Please call if you have any questions or comments.

Lyne McMurchie  
Enbridge Gas Distribution  
tel: 416-495-6353

## Lyne McMurchie

---

**From:** Lyne McMurchie  
**Sent:** Tuesday, December 07, 2010 4:11 PM  
**To:** Goulden, Bryan; 'eseaward@uniongas.com'; Rob Fennell; Trevor Maclean; Owen Schneider; Norm Ryckman  
**Subject:** Biomethane Ref Pricing Pres for OEB Dec 7 2010 V2.ppt  
**Attachments:** Biomethane Ref Pricing Pres for OEB Dec 7 2010 V2.ppt

Attached is the revised biomethane presentation with the changes discussed in our 2:30 meeting today, including:

- Slide 22 on utility asset ownership has been removed
- Slide 23 deleted "and providing supply that is voluntarily purchased by premium-paying customers"
- Slide 23 changed "the number of producers" to "the volume produced"

Bryan, thank you for sending this to the OEB tomorrow.

Cheers,

Lyne

## AGENDA

### Update: Renewable Natural Gas Application

May 6, 2011

#### Overview

---

- Application objective
  - To facilitate a market for green gas in Ontario

#### Application Key Components

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- Reference Price Paid to Proponents
  - Proponents pay 100% capital contribution upfront for utility assets
  - Reference price to cover energy source, landfill/digester, upgrading facility, gate station, mains/service over term of contract
- Connection Rate
  - To cover operating costs of stations/mains/service
- Utility Ownership of Select Upgrading Facilities
  - One of each source type – landfill, waste water treatment facility, food-based digester
  - For learning purposes and to help industry develop standards/certification
- Green gas comingled with traditional gas supply (1% -2%) and available to all customers
- Rate impact
  - ~ 2% -- <\$20 year/system customer

#### Other

---

- Timing of application
  - Before or after provincial election?
- Stakeholder Communications
  - Meetings with government, intervenors and industry groups have begun. Objective is to provide an update and identify issues.
  - Meetings re: timing of application -- Janet Holder and OEB Chair Rosemarie LeClair; Arunas Pleckaitis and OEB Chief Operating Officer Aleck Dadson.
  - Tentative: Union and EGD to hold a joint consultative meeting with intervenors prior to application submission

#### Questions

---

- Defining the regulatory 'ask'
- Issues

## **Lyne McMurchie**

---

**From:** Lyne McMurchie  
**Sent:** Friday, May 13, 2011 8:45 PM  
**To:** Seaward, Ed  
**Cc:** Goulden, Bryan; Trevor Maclean; Norm Ryckman; Owen Schneider; Edith Chin; Marco Spinelli; Yeasmin Choudhury; Karen Hockin (KHockin@uniongas.com); Rob Fennell  
**Subject:** Draft & Confidential Meeting Notes

Ed: Here are my draft notes to help with our discussion on Monday. Call me when you arrive and we'll get you set up on the third floor with a cubby for the day.

All: Note that there are Action Items for many of us below.

Lyne

Meeting notes May 13 2011

EDITS:

- Add wording in purpose to convey that we won't be going back once we have approval
- Add that we are protecting the existing and future customer base by making our product more sustainable.
- Acknowledge that this is a different type of application – public policy focus – and explain why we feel we are entitled to play a role (i.e. suppliers inquiring, customers support it etc. We are an effective instrument to carry out this public policy.)
- Use term 'existing landfill' so as not to conflict with diversion programs.
- Don't mention TCPL.
- Long term contract guidelines – reference them but don't dive in (though need strategy to respond). Be clear about acknowledging the risks and the mechanisms we are including to mitigate those risks re: supply contracts.
- Connection & EBO 188 – we will have different assumptions in feasibility analysis but this should not be a serious issue. Convey that EDG and UGL taking a consistent approach in that costs will be borne by producers. Question is pay now or in year X.
- List 5 other regulations supported by biogas but be sure to underscore 'cost effective' public policy – i.e. won't come at expense of feasibility. "Consequential benefits accrue..."
- Delete DSM and 'market transformation' references, use time-bounded and other features of market transformation programs.
- Trial? Pilot? Market Evolution? To be determined.
- Refer to bill increase in absolute values i.e. \$18-20 rather than 2%

TO DO:

- Develop a sample EGD contract for producers. Union to evolve theirs for RNG. Ensure no inconsistencies. Doesn't need to be filed with application, can note it as under development and submit later.
- Owen to share math on customer % increase and % of supply with Ed.

- Need strategy to respond to questions re: supply contract guidelines.
- Drew to evaluate price sensitivity for UGL, Owen to ask Stuart to do the same for EGD.
- Lyne to add ECO to stakeholder plan (in light of coming paper in opposition to landfill gas)
- Watch for David Suzuki Foundation report on shale gas coming soon.
- Karen will ask Pat to work on jurisdictional scan of biogas projects. Lyne to send NARUC resolution to Karen.
- Next steps:
  - Monday a.m. -- Make these modifications to application outline
  - Monday p.m. – Send to Fred Cass as is, end of day
  - Thursday (TBC) – conference call with Fred, Edith, Ed, Karen, Owen etc. to discuss a) questions Fred may have b) recommendations on who should develop what. Edith to set up.
  - Emily (UGL counsel) to review
  - Review by full team
- Develop schedule on when supply likely to come on to the system.
- Develop sensitivity analysis on gas price, volume, customer impact.
- Develop answer for potential IR on why system supply customers are to pay for this (for example: Promotes choice in the market -- gives customers the option of going to retailers, marketers free to sell 100% green gas, or 0% green gas etc.)
- Approach potential project partners for agreement to refer to them in application as 'ready to go with reference price'
- Stakeholder Communication Plan – add a filter 1) are they likely supportive and 2) how much weight will that support carry (Lyne to add to agenda for next meeting)

Lyne McMurchie  
Program Manager  
Special Projects  
Enbridge Gas Distribution  
Tel: 416-495-6353

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## Lyne McMurchie

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**From:** Lyne McMurchie  
**Sent:** Friday, May 27, 2011 4:50 PM  
**To:** Seaward, Ed; 'bgoulden@uniongas.com'; 'deverett@uniongas.com'; Rob Fennell; Trevor Maclean; Owen Schneider; Edith Chin; Marco Spinelli; Yeasmin Choudhury; Andrew Yang  
**Subject:** Notes and Action Items from Today's RNG Meeting

### Action Items from today's meeting:

- Ed and Lyne to finalize Milton meeting invite on June 6<sup>th</sup>
- Lyne to send Ed revised document with group's edits from today's meeting on Monday. Once jointly reviewed Monday afternoon, it will be sent to Fred Cass for further comment.
- Drew to contact Greg Tetrault, UGL rate manager, re: need for an injection rate. Union's M13 rate is not an injection rate, it's only for transportation. Union suggested EGD may not need a Board-approved rate; perhaps an agreement will suffice. Lyne has updated Anton, Edith and Joel. Drew to contact Lyne to set up a conference call for all parties to discuss.
- Develop presentation to be delivered at stakeholder consultation sessions – starting with intervenor presentation (Lyne – draft by June 3)
- By June 3<sup>rd</sup> we should be able to book a room in GTA for joint intervenor consultation session
- Jurisdictional Scan: UGL to explore
  - why RNG projects have been more successful in the US – they don't have a reference price, so what do they have and why does it work?
  - UGL: Add European examples to jurisdictional scan (For example, France has a FIT program. Germany and Sweden have done much too. And doesn't the UK have a new Renewable Heat program?)
  - UGL: Add Ontario biogas stats to add to Canada Highlights section.
- Owen to send Ed information on landfill methane outreach program in US so that Ed can update the 2003 reference in application (In 2003 the United States consumed 147 trillion BTU of energy (155,000 PJs from "landfill gas", about 0.6% of the total U.S. natural gas consumption.)
- Owen to double check Ed's BTU/PJ math!
- Legal counsel to opine on how much detail we should add about TGI/FortisBC and whether we should include adoption curve information
- UGL to add Seacliff or Hamilton paragraph to joint application as an example of a viable project waiting for RNG price
- Rob to revisit with legal counsel: applicability of trial/pilot language when we are asking to sign 20 year contracts
- Owen and Drew to determine correct QRAM volume and reconciliation with Salim's numbers. X potential = X volume system supply = X impact on bill

### Timeline:

#### Best case:

June 3<sup>rd</sup> Electrigaz Presentation meets with full agreement from EGD and UGL

June 10<sup>th</sup> Electrigaz's final written report shared with EGD and UGL

June 17 - 20<sup>th</sup> – EGD and UGL have worked out the math on price impact, supply volume etc.

#### Worst case:

June 3<sup>rd</sup> Electrigaz Presentation still requires work

June 10<sup>th</sup> Electrigaz Presentation meets with full agreement from EGD and UGL

June 17<sup>th</sup> Electrigaz's final written report shared with EGD and UGL



Have a great weekend.

Lyne McMurchie  
Enbridge Gas Distribution  
tel: 416-495-6353

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## Lyne McMurchie

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**From:** Lyne McMurchie  
**Sent:** Thursday, June 30, 2011 3:41 PM  
**To:** Rob Fennell; Norm Ryckman; Edith Chin; Owen Schneider; bgoulden@uniongas.com; eseaward@uniongas.com; Drew Everett (deverett@uniongas.com); Karen Hockin (KHockin@uniongas.com)  
**Subject:** Notes from today's UGL-EGD meeting

Team:

As some people joined/left at staggered times, I thought I'd send a summary note of today's meeting:

- Reference Prices

Just received information from Electrigaz. Owen, Stuart and Ed will review and discuss go/no go decision on Monday.

- Intervenor Session

Need to give two weeks notice (if 'go' on July 4<sup>th</sup>, session could be held week of 18<sup>th</sup> and 25<sup>th</sup>)

Week of 18<sup>th</sup> preferred (sooner) though note that technical conference being held for intervenors in Toronto July 25<sup>th</sup> for another matter.

Action item: Send your availability for these weeks to Edith Chin

- Bill Impact

Action items: UGL to share their rate impact calculations next week when closer to final EGD to send our calculations to UGL (Owen)

- Alberta Innovates Report

EGD has reviewed draft and considers it close to final

Action items: UGL to review and confirm comfort with sharing on Monday July 4

- Gas Purchase Agreement

Tania Persad and Dan Jones have spoken

Dan to make Drew's edits and send to Tania before leaving for vacation (off next week)

Action items: Drew to follow up with Dan re: GPA. EGD – UGL teams to review GPA next week in parallel

- Letters of Intent

(EGD) City of Toronto letter in development and Alpenglow letter received but more support than intent  
(UGL) Letter of support will be available and letters of intent likely

- Common Evidence:

-Review reference removed from evidence. RNG Program will end after 5 years.

-We will use total volume # rather simply percentage of supply in evidence.

-New version of joint evidence will be circulated for accuracy check when price, volume and rate impact information are added.

-Electrigaz draft report will be circulated to the team once Owen and Ed have finished their review. The final Electrigaz report may need to be tweaked to include a reference to the connection charge.

Have a great long weekend,

Lyne

Lyne McMurchie  
Program Manager, Special Projects  
Tel: 416-495-6353

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## Meeting Notes

### UGL – EGD Update meeting July 12

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1. Just and DE meetings:
  - a. DE – no significant concerns
  - b. Just – considers our approach problematic; predicts negative impact on their carbon offset efforts
2. Reference Price Term
  - a. Lyne to ask Anton, Karen to ask Union Gas Supply. Share suggestions and come to final agreement.
3. RNG and Municipalities
  - a. Questions re: sunk costs. EGD internal meeting July 14 to discuss further.
4. City of Toronto Decision – Impact?
  - a. We are not addressing policy in a cost of service application
5. Intervenor session prep:
  - a. We will be presenting and doing most of talking
  - b. Edith to draft list of Q&A, send to Karen. Rob and Bryan to review.
  - c. Speakers notes to be developed (Rob and Bryan to do their own)
  - d. Answer clarification questions but not detailed questions (not a technical conference)
  - e. Asking for feedback but not input
  - f. Meet one hour beforehand
  - g. Dress Code: suits to start
  - h. RSVP deadline today. Numbers not as high as hoped. Joanne is calling for follow up.
6. Agenda:
  - a. Karen and Edith to decide on agenda
  - b. Regulatory will be introducing presenters and announcing question period
  - c. Not sharing paper copies before with any stakeholders but okay after
7. RNG Approval
  - a. Bryan meeting with UGL execs one week after 19<sup>th</sup> to get final approval
  - b. Rob will discuss with Steering Committee and Arunas
8. Checklist:
  - a. GPA in discussion with EGD Legal
  - b. Bill impacts complete for both utilities

- c. Only residential impact to be mentioned; too varied for commercial. Larger customers buy their own gas.
- d. Use 'approximately 2%' for impact reference
- e. EGD: \$1,000 per month, 'other revenue', no Rider G. Will be in utility specific evidence.

9. Common Evidence

- a. Ed and Lyne to add information re: Electrigan prices to common evidence
- b. When ready, send to Emily and Fred and ask Fred to connect with Emily to discuss together
- c. Allocation process will be part of common evidence

10. Utility Specific Evidence will include:

- a. Station and Mains O&M costs – done
- b. Customer bill impact – calculated but wording needs to be added to evidence
- c. RNG Gas Purchase Agreement (similar for each utility). With Enbridge's Legal department for revisions.
- d. Letters of support and intent (2 each)

11. Application Letter

- a. Second draft complete; some changes required. Edith will discuss with Fred once evidence closer to final.

12. Stakeholder Meetings

- a. Mostly booked – Ministry of Energy and Municipal Affairs and Housing still outstanding.
- b. Will deliver the same presentation to all stakeholders.

**Lyne McMurchie**

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**From:** Lyne McMurchie  
**Sent:** Thursday, July 21, 2011 7:37 AM  
**To:** Rob Fennell; Trevor Maclean; Goulden, Bryan; eseaward@uniongas.com; Owen Schneider; Edith Chin; Karen Hockin (KHockin@uniongas.com); Yeasmin Choudhury; Andrew Yang; Drew Everett (deverett@uniongas.com)  
**Subject:** RNG CHECKLIST - Updated Version  
**Attachments:** CHECKLIST July 20 2011.docx

Hello:

Attached is the RNG Project Checklist, updated as per our discussion today.

Lyne

**RNG Project Checklist  
As of July 20 2011**

Sections	Status / To Dos	Target date	Owner
Legal Application	Fred has done 2 <sup>nd</sup> draft. To be finalized closer to date of submission.  Emily has a draft and will revise.		Edith
Common Evidence	Fill in the blanks related to: <ul style="list-style-type: none"> <li>• final customer impact</li> <li>• total supply volumes per utility</li> <li>• stakeholder meetings (Types of organizations, not names.)</li> <li>• benefit of supply \$ staying in ON</li> <li>• RNG pricing chart and details (sent copy to Rob and Bryan July 20 for review by 21st)</li> <li>• replace 'Reference Price' throughout with <b>Ontario RNG Supply Prices</b></li> </ul> Send all RNG pieces to UGL-EGD team for review	July 21	Lyne
	<ul style="list-style-type: none"> <li>• Fred and Emily to review evidence together</li> </ul>		Edith
	<ul style="list-style-type: none"> <li>• ISSUE: GHG impact may change as landfill emissions may be double counted. Contact Salim to discuss his approach.</li> </ul>	July 31	Drew
Common Appendices	Ipsos Reid Customer Research: <ul style="list-style-type: none"> <li>• Small error in report re: question asked of Commercial customers; Ipsos to correct and resend.</li> </ul>	July 21	Lyne
	Electrigaz report: <ul style="list-style-type: none"> <li>• Final draft submitted; to be discussed Thursday July 21 with Electrigaz.</li> <li>• Typos, grammar changes and review of page references etc. to be gathered by Yeasmin and forwarded in mark-up mode.</li> </ul>	July 31	Ed/Owen  Yeasmin
	Alberta Innovates report: <ul style="list-style-type: none"> <li>• Check GHG calculations for landfills and send final revised version if required.</li> <li>• Note: If GHG results change – notify ministry of enviro and intervenors</li> </ul>	July 31	Drew  Karen/Edith
	Supply Allocation Process: <ul style="list-style-type: none"> <li>• Complete</li> </ul>		Owen/Ed

Utility Specific Pieces	1-pager on how we derived customer bill impact – focusing on assumptions. (UGL will have similar appendix.)		Lyne/Jackie
	<p>Letters of Intent/support for EGD:</p> <ul style="list-style-type: none"> <li>• City of Toronto (received but still to be reviewed)</li> <li>• OMAFRA contact who was denied grid access</li> <li>• Alpenglow (received)</li> <li>• Walker (Expressed interest)</li> <li>• Yield Energy (Expressed interest)</li> <li>• UGL template to be sent to Lyne/Owen</li> </ul> <p>May consider broader participation from supporters. To be discussed.</p>		Owen / Rob  Ed  All
	1-pager on \$1,000 monthly O&M charges to producers (UGL pointing to M13)		Lyne/Jackie
	<p>RNG Purchase Agreement</p> <ul style="list-style-type: none"> <li>• In development</li> <li>• Determine whether or not to embed specs in contract</li> <li>• UGL has additions; will share with EGD as FYI</li> <li>• Keep pushing contract development for end of month but if not available, file application with a contract summary highlighting principles used as guidelines, then follow up with a contract filing separately.</li> </ul>	July 31	Owen/Tania
Admin	<ul style="list-style-type: none"> <li>• Senior-level confirmation to proceed</li> <li>• Development of potential IRs</li> </ul>	July 31 August	Rob Lyne / Owen / Ed/ Drew



## Lyne McMurchie

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**From:** Lyne McMurchie  
**Sent:** Thursday, August 04, 2011 12:13 PM  
**To:** Trevor Maclean; Owen Schneider; Rob Fennell; Goulden, Bryan; eseaward@uniongas.com; Drew Everett (deverett@uniongas.com); Karen Hockin (KHockin@uniongas.com); Edith Chin; Yeasmin Choudhury; Andrew Yang  
**Subject:** Meeting Notes: Aug 3rd UGL - EGD RNG Update

Below are meeting notes for those who were not in attendance at yesterday's RNG Update meeting.

Present: Rob Fennell, Bryan Goulden, Ed Seaward, Edith Chin, Karen Hockin, Yeasmin Choudhury, Andrew Yang and Lyne McMurchie

### **Bullfrog:**

Takes issue with RNG prices proposed; prefers RPS model  
Has made direct contact to Utilities to discuss  
Questions not answered as all responses will be communicated to all intervenors  
Trevor's feedback was shared with the team  
Agree to disagree  
ACTION ITEM: Rob will update Arunas  
ACTION ITEM: Lyne to develop IR on why we opted for this approach rather than suggest an RPS

### **Electrigaz Report:**

Team received latest draft with new format today  
Will be reviewing and discussing with consultant Aug 4  
Revised draft expected by next week (target: Aug 9) to have lawyers review by Aug 12  
Consultant will focus on costs and model in testimony  
ACTION ITEM: Ed and Yeasmin to send final report to Edith and Karen. Edith and Karen will send to respective lawyers and cc: Rob and Bryan.

### **Contract/Purchase Agreement:**

Tania at EGD has evolved contract based on UGL GPA, City of Toronto biogas contract and EGD local producer contracts. Meeting next week to agree on common business principles the Utilities' contracts should observe; differences between Utilities should be small.  
Objective of meeting: List of common business principles and any issues to be resolved  
ACTION ITEM: ED and Owen to update Rob and Bryan on issues after meeting  
ACTION ITEM: Lyne to invite Edith, Drew and Karen to Aug 8 meeting  
ACTION ITEM: Yeasmin to send Ed latest draft of EGD RNG producer agreement

### **Update on Evidence:**

Fred Cass and Emily Kirkpatrick have discussed evidence  
Emily would like to tighten language; expects to have this done by Aug 5  
Edith and Karen have sent their feedback directly to lawyers already  
Further changes should be made by the lawyers, via Edith and Karen  
Letters of support received or expected shortly: Miller Waste, Yield Energy, Alpenglow, APAO, OFA, AMO, Municipalities (City of Toronto, Region of Niagara, London, Guelph, Chatham-Kent, Hamilton etc.)  
Fred advised that customer surveys have not been given substantial weight by Board in the past  
ACTION ITEM: Lyne to send Rob's changes to Fred Cass via Edith and send Rob and Tim Adamson the municipal template  
ACTION ITEM: Karen to send Rick Birmingham's changes to Emily

**ACTION ITEM:** Ed to follow up with Salim re: use of carbon neutral term

**Utility Specific Evidence:**

EGD monthly charge still under review but expected to be finalized soon

UGL finalizing bill impact

**ACTION ITEM:** Lyne to follow up with Anton re: calculations and assumptions of monthly charge

**Other:**

NRCAN funding announcement – issue?

**ACTION ITEM:** Ed to examine and communicate back to team

Target Submission to Board: Aug 23

Next meetings set for Aug 9 and Aug 12

Lyne

Lyne McMurchie

Program Manager, Special Projects

Tel: 416-495-6353

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## Lyne McMurchie

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**From:** Lyne McMurchie  
**Sent:** Wednesday, August 10, 2011 10:46 AM  
**To:** Lyne and Tyler  
**Subject:** FW: RNG Update Meeting - Notes

Lyne McMurchie  
Program Manager  
Special Projects  
Enbridge Gas Distribution  
Tel: 416-495-6353

---

**From:** Lyne McMurchie  
**Sent:** Wednesday, August 10, 2011 10:20 AM  
**To:** Rob Fennell; Trevor Maclean; Goulden, Bryan; Seaward, Ed; Edith Chin; Karen Hockin (KHockin@uniongas.com); Owen Schneider; deverett@uniongas.com; Yeasmin Choudhury; Andrew Yang  
**Subject:** RNG Update Meeting - Notes

Hello:

Below are notes from yesterday's RNG Update meeting.

Thanks,

Lyne

### RNG Update Meeting Notes August 9 2011

**Present:** Rob Fennell, Bryan Goulden, Owen Schneider, Edith Chin, Yeasmin Choudhury, Andrew Yang, Lyne McMurchie, Ed Seaward, Drew Everett.

RNG Filing – Parts Completed:

- Customer Research
- Salim's Research

**Note:** ARC/Salim's calculations assumed that no large landfills flare, when in fact some do because of provincial legislation requiring them to do so if not grandfathered. Salim is not changing his report in light of this and is comfortable defending his approach on the stand. The impact on the GHG emissions calculation is approximately 10% which is considered acceptable to the team, given that we could reduce the GHG emissions by 10% and still be no more accurate. Salim's report will stay as is but evidence will be softened to avoid conveying a level of precision that is actually not attainable and was not part of Salim's scope.

**ACTION ITEM:** Lyne to review the evidence, soften then language and send changes to Fred /Emily via Edith/Karen.

RNG Filing -- Incomplete:

Electrigaz:

- Final report received from Eric
- Karen has sent to Emily, Edith sending to Fred Aug 10 with comments for context; but both lawyers focusing on common evidence right now.

- ACTION ITEMS: All to review report and send comments (if any) to Owen, Yeasmin, Ed and Drew by mid-day Friday. Yeasmin will email team with consolidated report edits and will set up 2 meetings for Monday – 1) Ed, Drew, Owen and Yeasmin and 2) review with Edith and Karen to discuss balance of independence/polish. Consolidated comments will then be passed on to Eric.

#### Common evidence:

- With lawyers for review
- Comments expected back by end of day Aug 11
- Edith and Karen will manage internal regulatory approvals.
- ACTION ITEM: Lyne to review draft of Edith's 'Notes To Draft' and research answers to use, should Fred confirm that changes or references are required.

#### GPA:

- Agreement by all that we are not filing purchase agreement but will have it ready for IRs.
- High-level business principles for purchase agreement will be embedded in common evidence.
- ACTION ITEMS: Owen to send edits to Ed by Wednesday end of day. Edith and Karen will advise Fred and Emily that we will be changing evidence to include allocation process and purchase agreement principles. Lyne to update Tania on edits and inclusion in evidence and will confirm that contribution, deposit, and true-up use actual costs.

#### Allocation Process:

- To be embedded in common evidence.
- Karen has drafted revisions.
- ACTION ITEMS: Karen and Edith will revisit prior to Friday Aug 12 meeting.

#### List of interested parties:

- Debate on whether or not we should draft this list.
- ACTION ITEM: Karen and Edith to decide best course of action.

#### Volume References in Evidence:

- To be expressed in PJ's first, then in 103 m3 for reference.

#### Customer Impact:

- UGL intending to put more detail into customer impact one-pager (i.e. will be explaining where \$15/GJ came from, where volume figures came from, may include schedule for bill impact similar to QRAM).
- ACTION ITEMS: Karen will follow up with Lyne on Wednesday with more detail. Lyne to follow up with Jackie for more substance regarding how EGD numbers derived.

#### Monthly Producer O&M Charge:

- Arunas wanted better understanding of how this charge was structured. Rate design provided information on justification for the \$1000/monthly charge, which was circulated back to Arunas.
- ACTION ITEMS: Rob meeting with Arunas on Monday. Will follow up but no changes expected. UGL will complete their one-pager on producer charge this week, pointing to M13.

#### Letters of Support:

- Pursue Quest letter via Tim Short / Darren McIlwraith but no need to secure CGA letter.
- FCM, no letter likely as they directed us to AMO.
- City of Ottawa - didn't have the right people at the table.
- EGD – No letters of intent, only support. See below for details. UGL – One letter of intent from Seacliffe (no reference to Alpenglow)
- ACTION ITEM: Rob to follow up with City of Ottawa for support letter next week. Lyne to notify Marco re: CGA.

#### Meetings with Ministries of Energy and Municipal Affairs and Housing:

- Ben Hamilton has repeatedly tried to secure a meeting time with the ministries so that we could present on RNG as an FYI. He has many calls into the ministries and wants to hold ownership of this request.

- Both utilities have numerous other regulatory asks for which they need Ministry time; Ben reports that it has been difficult to get time on several projects, not just RNG. Could CC: them when we file, or could consider our attempts sufficient courtesy to keep them posted.
- ACTION ITEM: Rob will follow up with Ben and Bryan will follow up with Matt to discuss further.

#### RFP vs. Fixed RNG Price

- Arunas has requested more detail on the two approaches and why we selected fixed price option; needs a full understanding in order to feel comfortable proceeding. EGD team pulling together a list of pros and cons for each approach.
- ACTION ITEM: Lyne to discuss with team members (including UGL and Trevor before his vacation) and send draft to Rob, who will also get Fred's input.

#### APAO

- Has sent us questions re: RNG. Must accord them same treatment as Bullfrog. Can send clarifications to our presentation but not new information until IRs.
- ACTION ITEM: Ed will follow up with them.

#### Meetings

- Next meeting: Changed to August 12 at 9:30 a.m.

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#### Letters of support (EGD)

- Received:
  - Vincent Sferrazza, Acting General Manager, City of Toronto
  - Bette Jean Crews, President, Ontario Federation of Agriculture
  - Derek Riley, President, Yield Energy
  - Nigel Guilford, General Manager, Miller Waste Systems
  - Jason Moretto, President, Alpenglow Energy
- To come:
  - Region of Durham
  - Niagara Region
  - Association of Municipalities of Ontario (AMO)
  - AgriEnergy Producers' Association of Ontario (APAO)
  - Walker Industries
- Tentative:
  - TRCA – Owen will call
  - Ottawa – Rob will call
  - Quest – Tim Short
  - Venture – Owen will ask
  - CCI Kevin Matthews – Owen will ask

#### Letters of Support (UGL)

- Received:
  - City of Hamilton
  - City of London
  - City of Chatham-Kent
  - OFA
  - Alpenglow Energy
- Expected to come:
  - APAO
  - AMO
  - Maple Reinders Construction
  - City of Guelph

## Lyne McMurchie

---

**From:** Lyne McMurchie  
**Sent:** Tuesday, August 16, 2011 9:00 AM  
**To:** Rob Fennell; Trevor Maclean; Goulden, Bryan; Seaward, Ed; Owen Schneider; Drew Everett (deverett@uniongas.com); Andrew Yang; Edith Chin; Yeasmin Choudhury; Karen Hockin (KHockin@uniongas.com)  
**Subject:** UGL-EGD RNG Update Meeting - Aug 12 - Notes

Hello:

Below are notes from our Aug 12<sup>th</sup> UGL-EGD RNG Update meeting. Please review for any action items prior to our next meeting:

1. Initial Notes to Draft on Common Evidence:
  - a. Not addressed in this meeting. Team will wait for lawyers to provide their questions/comments on evidence first.
2. Customer Impact:
  - a. EGD's and UGL's evidence on customer impact being finalized. UGL planning to file schedules.
3. Common evidence:
  - a. GHG reductions language revised.
4. Legal Review:
  - a. Call with Fred and Emily in the afternoon of Aug 12.
  - b. No specific concerns mentioned by Emily; Fred expects resistance.
  - c. ACTION ITEMS: Karen and Edith to circulate cleaner version of evidence once received from lawyers. Edith and Rob to meet on Aug 15 to discuss.
5. Electrigaz Report: Lawyers not yet finished reviewing.
6. Gas Purchase Agreement:
  - a. UGL close to final. EGD's in development. Tania Persad away Aug 24 for 2 weeks.
  - b. Common Principles to be refined.
7. List of interested parties & other stakeholder matters:
  - a. Team agreed to cc all intervenors from the 19<sup>th</sup> session and all other parties we consulted with on RNG when we file with Board.
  - b. ACTION ITEMS: Lyne will send Karen list of who we met with. Karen will find out protocol on government as 'interested parties'
  - c. Letter of support requested of Quest.
  - d. Ministries of Energy and Municipal Affairs and Housing: Ben Hamilton wants to keep trying to secure meeting time. UGL suggested contact for MMAH
  - e. ACTION ITEM: Rob will follow up with Ben the week of Aug 15
  - f. CCC, Just, Bullfrog will not support application, VECC and LIEN and Shell may also oppose.
  - g. ACTION ITEM: Owen and Ed to respond to Shell's request for a meeting (same response as that given to Bullfrog)
8. Draft document on supply model (Standard Offer vs RFP) prepared as potential IR
9. Next Meetings:
  - a. ACTION ITEM: Lyne to set up next meetings – Aug 17 @ 1 p.m. and Aug 19 @ 9:30 a.m.

Lyne McMurchie  
Program Manager, Special Projects  
Tel: 416-495-6353

## **Lyne McMurchie**

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**From:** Lyne McMurchie  
**Sent:** Thursday, August 18, 2011 2:29 PM  
**To:** Rob Fennell; Goulden, Bryan; Seaward, Ed; Karen Hockin (KHockin@uniongas.com); Edith Chin; Drew Everett (deverett@uniongas.com); Owen Schneider; Yeasmin Choudhury; Andrew Yang; Trevor Maclean  
**Subject:** EGD-UGL RNG Team Update -- Meeting Notes - August 17

FYI, here are notes of our August 17 update meeting:

1. Common evidence:
  - Answers for citation requests received
  - Edith has circulated lawyers' evidence revisions to the team.
  - Regulatory groups in the process of going through the materials
  - Action item: team to review evidence for accuracy and email any comments to Edith by Aug 18 at noon.
2. Electrigaz Report:
  - Meeting scheduled for Aug 17
  - Final version expected Aug 19
  - Action Item: Yeasmin to circulate final report to team
3. Customer Bill Impact Evidence:
  - UGL finalizing, as is EGD. To be shared when complete.
4. Letter of Intent:
  - UGL has received one letter of intent
  - Action item: Ed to forward when ready
5. RNGPA:
  - Can producer break contract before 20 yrs?
    - i. For: If they break contract, market is enabled.
    - ii. Against: Customers should have the benefit of RNG over the 20 years.
  - Action items: Lyne to set up EGD discussion on RNGPA draft; Ed to send UGL's RNGPA to EGD when complete mid next week.
6. OMAFRA:
  - Can't file email but can use information on their website for IR development.
7. Other:
  - Arunas comfortable with team proceeding with standard offer approach.
8. Timing:
  - UGL planning internal full review of final package by end of this week with focus on Regulatory; sign off next week.
  - EGD – planning similar timeline

Thanks,

Lyne

Lyne McMurchie  
Program Manager, Special Projects  
Tel: 416-495-6353

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## Lyne McMurchie

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**From:** Lyne McMurchie  
**Sent:** Wednesday, September 07, 2011 7:42 AM  
**To:** Rob Fennell; Edith Chin; Owen Schneider; Yeasmin Choudhury; Goulden, Bryan; Seaward, Ed; Karen Hockin (KHockin@uniongas.com); Drew Everett (deverett@uniongas.com)  
**Subject:** Notes of Sept 6 2011 RNG Update Meeting

Hello,

Here are notes from our RNG update meeting yesterday:

Attendees: Rob Fennell, Edith Chin, Lyne McMurchie, Bryan Goulden, Ed Seaward, Karen Hockin, Drew Everett

### 1 - Roger Higgin email suggesting RNG be part of utilities' own use and paid by all customers:

- EGD's own use is a fraction of volume proposed as part of Program and not significant enough to start a market. Have looked at rolling RNG costs into distribution in the past and agreed there are a number of complexities that resulted in us selecting the system gas route.
- ACTION - Rob will call Roger to thank him for the suggestion

### 2. Electrigan Report

- Meeting went well
- Report split into two – pricing and costing. Received today.
- Will bill on time and materials
- ACTION - Ed to circulate the report to team members
- ACTION – All to read prior to next meeting

### 3. Next Meeting

- Thursday Sept 8 11 a.m.
- ACTION - Categorize comments – 1)editorial, 2)factual errors, 3)changes required to tie evidence to pricing

### 4. Common evidence

ACTION – Rob to send Owen's first cut of edits to common evidence (references to Electrigan report) to Ed, Ed to modify and send to Karen and Edith to review by Thursday

### 5. Loose ends

EGD's monthly O&M charge to producers may be split into fixed monthly fee of \$333 plus 2.173 cents/m<sup>3</sup>. Works best for Enbridge franchise with many smaller players and fewer large landfills. UGL not opposed but preference is to avoid complexity.

ACTION – Lyne to check O&M charge with Joel. Yeasmin to run against most likely producer scenarios to calculate monthly total and compare to Electrigan O&M costs and update Rob prior to next meeting. EGD to update UGL on Thursday.

ACTION – Karen to share UGL's final rate impact information with Edith

ACTION – Drew/Ed to send latest version of UGL's RNGPA to EGD team

ACTION – Yeasmin will ask Belinda to do a final sanity check on all numbers using cost, price, volume, equity thickness.

### Other:

ACTION – Yeasmin to call Venture re: final letter of support, Lyne to get final City of Toronto letter from Marco.

Lyne McMurchie

## Lyne McMurchie

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**From:** Lyne McMurchie  
**Sent:** Thursday, September 08, 2011 2:08 PM  
**To:** Rob Fennell; Goulden, Bryan; Seaward, Ed; Karen Hockin (KHockin@uniongas.com); Drew Everett (deverett@uniongas.com); Yeasmin Choudhury; Edith Chin; Owen Schneider  
**Subject:** Notes from Sept 8th meeting

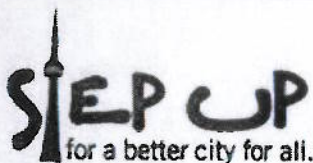
### Notes from Sept 8<sup>th</sup> RNG update meeting

Present: Yeasmin Choudhury, Bryan Goulden, Rob Fennell, Drew Everett, Ed Seaward, Edith Chin, Karen Hockin, Lyne McMurchie

1. **Electrigaz Report**
  - a. Discussion of reports
  - b. Ed is key contact in Owen's absence and will be speaking to Eric today
  - c. ACTION – Karen to suggest wording for utilities' part and will send to Edith today
  - d. ROE figures double-checked and appear accurate
  - e. ACTION – Yeasmin to call Ed about Belinda's comments today
  - f. Next steps: Ed will get 'Draft Final' next Monday from Eric
  - g. ACTION – Lyne to set up meeting for EGD team to review Monday Sept 12
2. **Timing**
  - a. One week required for senior level reviews once package complete (including Crawford Smith replacing Emily Kirkpatrick on mat leave)
  - b. Agreed that goal is to do internal reviews next week and file with the Board the week of Sept 19
  - c. ACTION – Lyne to schedule follow up RNG utility update meeting Sept 12 at 3:30 p.m.
3. **Other**
  - a. ACTION – Ed will send edits to common evidence to Karen/Edith once the report language is confirmed Monday. Edith to update common evidence. Lyne to send Edith her comments on common evidence today.
  - b. ACTION – Owen to update paperwork to reflect scope.

Lyne McMurchie  
Program Manager, Special Projects  
Enbridge Gas Distribution  
Tel: 416-495-6353

Please sponsor me for the 2011 United Way CN Tower Climb: (Click below)



## **Lyne McMurchie**

---

**From:** Lyne McMurchie  
**Sent:** Tuesday, September 13, 2011 8:39 AM  
**To:** Rob Fennell; Goulden, Bryan; Seaward, Ed; Owen Schneider; Edith Chin; Karen Hockin (KHockin@uniongas.com); Drew Everett (deverett@uniongas.com); Yeasmin Choudhury  
**Subject:** RNG UGL-EGD Update Meeting Notes - Sept 12, 2011

### **Notes from yesterday's UGL-EGD RNG Update meeting –**

**Participants:** Rob, Bryan, Owen, Ed, Edith, Karen, Drew, Lyne

#### **Electrigaz Report:**

- Almost done; some assumptions to be added to pricing report
- Okay to circulate for internal review
- **ACTIONS** – Owen and Ed to discuss this and other small loose ends today; Ed will call Eric. Lyne to send Edith latest reports.

#### **Evidence Package:**

- Some changes to common evidence already suggested by Norm Ryckman as part of EGD Steering Committee review but based on an earlier version of the document. EGD team will meet to start addressing some of Norm's comments (source references etc.)
- Okay to circulate latest version of common evidence as part of RNG package for internal reviews
- Lyne to follow up with Anton re: EGD producer charge write-up. Charge will now be a combination of a fixed fee for the RNG gate station and a variable fee for the pipeline connection to more accurately reflect producer costs.
- **ACTIONS** -- Edith to make one change to common evidence based on reference to Reports and will send package to Karen, Fred Cass, Norm and EGD team. Rob will handle EGD Steering Committee reviews. Karen will circulate internally at UGL.

#### **Timing:**

- Regulatory calendar booking up quickly, particularly at UGL.
- **ACTIONS** – UGL and EGD teams to share estimated review completion dates once internal calendars and counsel availability confirmed. Karen and Edith to book final RNG meeting with Legal and Regulatory to discuss edits generated by internal review process.

#### **RNGPA:**

- UGL shared latest draft of their PA with Lyne. Document approved by the business and now moving into next stage of approvals process (Risk department etc.) at UGL.
- **ACTION** – Lyne to share with EGD team and Owen to meet with Risk dept this week to discuss.

Lyne

Lyne McMurchie  
Program Manager, Special Projects  
Enbridge Gas Distribution  
Tel: 416-495-6353

ENBRIDGE GAS DISTRIBUTION INC.  
UNION GAS LIMITED  
RESPONSE TO POLLUTION PROBE INTERROGATORY #1

Issues 2.1 & 2.2: Are the proposed costs from landfill and anaerobic digester sources reasonable and appropriate?

Reference: Exhibit B, Tab 1, page 21

Preamble:

One of the potential benefits of purchasing biomethane is a net reduction in Ontario's and Canada's greenhouse gas emissions. Pollution Probe wishes to know the incremental cost of achieving these greenhouse gas reductions (\$ per tonne of net greenhouse gas emission reduction).

The incremental cost will be a function of numerous factors including the price paid for biomethane, the price of the alternative supply option (natural gas) and the incremental greenhouse gas emission reductions (net of free-riders) if Enbridge and Union purchase biomethane instead of natural gas.

Interrogatory:

Please provide your best estimates of the incremental greenhouse gas emission reduction costs (\$ per tonne) of your proposed procurement programs for biomethane from:

- a) landfill gas; and
- b) anaerobic digestion.

Please show your calculations and state and justify all of your input assumptions.

Please provide a sensitivity analysis using high and low estimates of the cost of natural gas.

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**Response:**

Please see responses to GEC Interrogatory #1 to #4 (Exhibit I-9-1 to I-9-4) and CME Interrogatory #5 (Exhibit I-6-5).

“Implied GHG Reduction Values” are provided in the table and chart below. A number of assumptions were required to make these calculations, including:

- A range of conventional natural gas market prices, per GJ, of \$4, \$8, \$12. Please see CME #5 d and e for NYMEX future prices (to 2024) and historical WACOG prices (1999 – 2011).
- CO<sub>2</sub> “emission values” have been included for “substitution” and “substitution and emission reduction” impacts based on the conversion factors included at Exhibit B, Tab 1, Appendix 1, page 48. This approach is consistent with the approach used in response to GEC #1 to calculate the requested range of “Relative Values of Carbon”. Please refer to GEC #1 for an explanation of the upper and lower ranges of GHG emissions which also apply to this response.

The requested “Implied GHG Reduction Values” have been calculated at each of the proposed upper and lower tiers for RNG prices as proposed in this application. As can be seen in the chart below, 24 different “Implied Values” are presented which are dependent on the following three sets of variables:

- The proposed price of RNG in the program (four different prices, based on high and low for AD and Landfill, \$17 - \$11, \$13 - \$6)
- A range of three different conventional natural gas market prices as stated above (\$4, \$8, \$12)
- GHG reduction (t CO<sub>2</sub>/GJ) for “substitution only” and GHG reduction (t CO<sub>2</sub>/GJ) for “substitution and emission reduction”

These calculations assume that all of the benefits of acquiring RNG as part of system supply are attributable to GHG reductions however, as noted in Pollution Probe’s Interrogatory #1, the reduction of greenhouse gas emissions is but one of the potential benefits of purchasing biomethane. The other benefits are outlined at Exhibit B, Tab 1, pages 8 to 10. The actual value of the GHG reductions resulting from the proposed Program would be some fraction of the values shown in the table and chart below.

**Table 1**

Line No.	RNG Price (\$/GJ)	Natural Gas Price (\$/GJ)	Premium/ (Discount) (\$/GJ)	GHG Reduction		Implied GHG Reduction Value	
				Substitution Only <sup>(1)</sup> (t CO <sub>2</sub> /GJ)	Substitution and Emission Reduction <sup>(2)</sup> (t CO <sub>2</sub> /GJ)	Substitution Only (\$/t CO <sub>2</sub> )	Substitution and Emission Reduction (\$/t CO <sub>2</sub> )
	(a)	(b)	(c) = (a) - (b)	(d)	(e)	(f) = (c) / (d)	(g) = (c) / (e)
1	\$ 17.00	\$ 12.00	\$ 5.00	0.051	0.428	\$ 98.04	\$ 11.68
2	\$ 13.00	\$ 12.00	\$ 1.00	0.051	0.428	\$ 19.61	\$ 2.34
3	\$ 11.00	\$ 12.00	\$ (1.00)	0.051	0.428	\$ (19.61)	\$ (2.34)
4	\$ 6.00	\$ 12.00	\$ (6.00)	0.051	0.428	\$ (117.65)	\$ (14.02)
5	\$ 17.00	\$ 8.00	\$ 9.00	0.051	0.428	\$ 176.47	\$ 21.03
6	\$ 13.00	\$ 8.00	\$ 5.00	0.051	0.428	\$ 98.04	\$ 11.68
7	\$ 11.00	\$ 8.00	\$ 3.00	0.051	0.428	\$ 58.82	\$ 7.01
8	\$ 6.00	\$ 8.00	\$ (2.00)	0.051	0.428	\$ (39.22)	\$ (4.67)
9	\$ 17.00	\$ 4.00	\$ 13.00	0.051	0.428	\$ 254.90	\$ 30.37
10	\$ 13.00	\$ 4.00	\$ 9.00	0.051	0.428	\$ 176.47	\$ 21.03
11	\$ 11.00	\$ 4.00	\$ 7.00	0.051	0.428	\$ 137.25	\$ 16.36
12	\$ 6.00	\$ 4.00	\$ 2.00	0.051	0.428	\$ 39.22	\$ 4.67

(1) GHG reduction from fuel substitution calculated from pre-filed evidence Exhibit B, Tab 1, Appendix 1, Page 48  
 = 2,677.7 kt CO<sub>2</sub> / (1,373 M m<sup>3</sup> \* 0.0379 GJ/m<sup>3</sup>)

(2) GHG reduction from fuel substitution and emission reduction calculated from pre-filed evidence Exhibit B, Tab 1, Appendix 1, Page 48  
 = 2,677.7 kt CO<sub>2</sub> / (1,373 M m<sup>3</sup> \* 0.0379 GJ/m<sup>3</sup>) + 10,327.8 kt CO<sub>2</sub> / (723 M m<sup>3</sup> \* 0.0379 GJ/m<sup>3</sup>)

**Figure 1**

