Addendum #1

to

London Hydro's

Request for Proposal

for

Advanced Metering Infrastructure (AMI) – Phase I Smartmeter Deployments

Issued: October 2, 2007

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1. INTRODUCTION

1.1 Background

As the lead local distribution company (LDC) in a Smartmetering consortium consisting of twenty-one (21) LDC's, on August 15th, 2007 London Hydro issued a *Request For Proposal (RFP)* and an *Information Supplement* for Advanced Metering Infrastructure (AMI) to enable bidders to submit a two part proposal comprising of a technical and project management proposal and a cost proposal. Full titles of the RFP documents are given in Section 1.6, *Reference Documents*, below.

Within the RFP document, Section 4.3, *Bidders Conference*, Section 4.4, *Requests for Clarification or Additional Information*, and Section 7.5.4, *Addenda: Errors and Omissions*, provide a formal mechanism for London Hydro (on behalf of the Smartmeter consortium) to issue revisions, additions and clarifications to the RFP.

These addenda are prepared in accordance with London Hydro's guideline document entitled: *Guidelines for Responding to Bidder's Inquiries and Issuing Addenda*.

1.2 Purpose and Intent

This addendum forms an integral part of the contract documents and shall be included therein. Bidders shall read the complete Addendum and take into account items affecting their proposal. No consideration will be allowed for increases (extras) to the Contract Price due to failure of the Bidder to familiarize himself with this addendum.

Each bidder shall be responsible for ascertaining, prior to submitting a Proposal, that it has received all issued Addenda.

1.3 Interpretation

This Addendum forms part of and shall be read together with the RFP documents.

All terms used in this Addendum which are defined in the RFP documents shall have the meaning assigned therein unless the context otherwise requires.

In the event of any inconsistency between the terms of this Addendum and the RFP documents, the terms of this Addendum shall prevail. Where the conflict is with the terms of an additional Addendum or amendment entered into after the date hereof, the terms of the later Addendum or amendment shall prevail.

1.4 Acknowledgement of the Addendum

Bidders shall formally acknowledge receipt of this addendum in their proposal submission. A suggested approach is inclusion of the following phrase in their covering letter (as described in Section 7.2.1, *Cover Letter*, of the RFP):

Receipt of Addendum Numbers _____, _____, _____ is hereby acknowledged.

1.5 Conventions

The conventions described following are used for published addenda to the RFP and Information Supplement:

- Every amendment to the RFP will be uniquely identified by the designator "#RFP-n", where "n" is the amendment number starting at "1" and continuing, irrespective of addendum. For example, if there were two amendments in this addendum designated #RFP-1 and #RFP-2, any amendments contained in the next addendum would start at #RFP-3.
- Every amendment to the Information Supplement will be uniquely identified by the designator "#IS-n", where "n" is the amendment number starting at "1" and continuing, irrespective of addendum. For example, if there were three amendments in this addendum designated #IS-1, #IS-2 and #IS-3, any amendments contained in the next addendum would start at #IS-4.
- For amendments, deleted text is shown with strike-outs and yellow highlight.
- For amendments, changed or new text is shown with green highlight.

1.6 Reference Documents

The following documents are referred to within this Addendum:

[1] London Hydro *Request for Proposal for Advanced Metering Infrastructure (AMI) – Phase I Smartmeter Deployment*; dated August 14, 2007

[2] Information Supplement to London Hydro Request for Proposal for Advanced Metering Infrastructure (AMI) – Phase I Smartmeter Deployment; dated August 14, 2007.

[3] London Hydro internal document entitled: *Guidelines for Responding to Bidder's Inquiries and Issuing Addenda*; Revision R0.

[4] London Hydro internal document entitled: *Guidelines for Conducting the Bidders' Conference*; Revision R1.

2. RFP CORRECTIONS AND REVISIONS

The RFP amendments given below, issued subsequent to the original RFP document, override the referenced clauses within the original RFP document.

2.1 Amendment #RFP-1

- RFP Reference: Section 5.1.4, *Expired 600 V Delta Meters in Westmount Mall*; final paragraph; page 17.

- Original Text: In total, there are one-hundred and sixty (160) electric meters and eight (8) water meters associated with this Smartmeter deployment.

- Revised Text: In total, there are one-hundred and sixty (160) electric meters and eight (8) water meters associated with this Smartmeter deployment. The meter forms required for Westmount Mall are tabulated following:

Revenue Meter Type / ANSI Form	Quantity Required
3-Ph, 3-W, 600 V, 100/200 A; Form 12S	150
3-Ph, 4-W, 345/600 V, 200 A; Form 16S	4
3-Ph, 4-W, 120/208 V, 200 A; Form 16S	6

Note: There are also eight (8) 3-Ph, 4-W, transformer rated (ANSI Form 36A) combination energy / demand meters; some are used for bulk-metered customers and others for check-metering. These revenue meters aren't part of this RFP, but may be negotiated as an extra during the Statement of Work phase with the successful bidder.

2.2 Amendment #RFP-2

- RFP Reference: Section 6.1.7.1, *Revenue Meters within Scope of Provincial AMI Specification*; preceding the final paragraph on page 39.

- Original Text: There are also a number of electric services within London Hydro's service territory that are outfitted with combination energy and demand meters, but …

- Revised Text: Note: In instances where only socket-type meter cases are available, London Hydro will give favourable consideration to the use of robust "A-base to socket" adapters. The cost of these accessories will be considered in the evaluation of proposals.

  There are also a number of electric services within London Hydro's service territory that are outfitted with combination energy and demand meters, but …

3. INFORMATION SUPPLEMENT CORRECTIONS AND REVISIONS

The Information Supplement amendments given below, issued subsequent to the original Information Supplement document, override the referenced clauses within the original Information Supplement document.

3.1 Amendment #IS-1

- IS Reference: Section 2.4, *Other Restrictions & Grounds for Disqualification (Section 4.5)*; final sentence; page 3.
- Original Text: … and bid evaluation phases, except as permitted in the RFQ (e.g. Section 7.4.2, *Request for Additional Information*), may be grounds for disqualification.
- Revised Text: … and bid evaluation phases, except as permitted in the RFQ (e.g. ~~Section 7.4.2~~ Section 7.4.3, *Request for Additional Information*), may be grounds for disqualification.

3.2 Amendment #IS-2

- IS Reference: Section 2.14, *Value Added Functionality (Sections 6.2.9 and 6.2.10)*; text within "Application #1 – Standard"; page 20.
- Original Text: Application #1 – Standard

  In theory the watchdog software would send out low-level pings (application layer) to all possible AMI infrastructure devices based on a user definable time schedule.

  For example Guelph Hydro would could use the following schedule:
- Revised Text: Application #1 – Standard

  In theory the watchdog software would send out low-level pings (application layer) to all possible AMI infrastructure devices based on a user definable time schedule.

  For example Guelph Hydro would ~~could~~ use the following schedule:

4. ANSWERS TO BIDDERS QUESTIONS

The questions raised to date by one or more bidders have been captured below, along with the Smartmeter consortium's answers. These answers to bidders' questions are intended only to assist bidders in better understanding the prevailing conditions, the consortium's expectations, and guidance to bidders in the preparation of their respective proposals. Nothing in this section should be construed as modifying or overriding any requirement stated in the RFP or Information Supplement.

Question #1: Will London Hydro provide a Microsoft Word version of the RFP to aid prospective vendors in their response process?

Answer: To maintain document control, WORD versions of the RFP and Information Supplement will not be provided. However, a WORD version of Appendix D, *Form of Tender*, will be sent to all known bidders (i.e. those that have submitted a Notice of Intent to Propose) and posted on both London Hydro's website and the MERX site.

Question #2: What is the status of the WiMAX municipal wireless broadband network for London and when is an RFP expected to be released?

Answer: At this point in time, there is much uncertainty regarding the release date (if any) of an RFP for a WiMAX municipal wireless broadband network in London. It is unlikely to occur before a contract has been awarded to the successful AMI bidder for reasons listed below:

- The feasibility study for the proposed municipal wireless network was based on several assumptions, one significant assumption being a Smartmeter traffic model and the associated budgetary costs of obtaining this service from public wireless carriers (e.g. Bell, Rogers, Telus). Our assumptions will have to be validated based on the selected AMI solution.
- Our municipal partner, the City of London, previously endorsed Phase I of the project which was the field trials carried out with WiFi technology and a feasibility study for a WiMAX solution. The decision-makers within the City of London need to be presented with a summary of the Phase I outcome, supplementary information and the business case for continuing the partnership into Phase II. Such a decision affects many departments within the organization and isn't going to be made in haste.
- There have been some administrative delays by Industry Canada in establishing spectrum assignments for mobile first responder applications in Canada.

When a decision is made to proceed, prudence would suggest a phased implementation approach to a municipal wireless broadband network.

Question #3: Is there an official contact list for the LDC's participating in the Smartmetering consortium?

Answer: No. To ensure that the Smartmetering consortium provides uniform answers and other information to all bidders, we have limited bidder contact with the Smartmeter consortium to those individuals identified in Section 4, *Contact Information.* However, all responses or other information provided to bidders will first be vetted by all consortium LDC's and the Fairness Commissioner (in accordance with our internal guideline document – see Ref [3]).

Question #4: Neither the RFP nor Information Supplement include requirements for so-called "*sub-metering*" solutions. Are there future plans for introducing this option?

Answer: We presume the question is in reference to Ontario Regulation 442/07, *Installation of Smart Meters and Smart Sub-Metering Systems in Condominiums*; August 2007. LDC's such as Oakville Hydro that have active sub-metering programs in-place are likely to continue with such endeavors. For the other LDC's in the consortium, the combination of the discretionary nature of new Regulation and the significant deployment effort and 2010 deadline for smart meter installations, will realistically mean that many LDC's will defer serious consideration of smart sub-metering systems until 2010.

Note: While it is understood that some members of the Coalition of Large Distributors (CLD) are showing active interest in Smart sub-metering systems, the CLD is also much further along with smart meter deployments than this Smartmeter consortium.

Question #5: Will there be a formal "*short list*" published of approved bidders / technologies to give consortium LDC's some direction, i.e. will you be adopting the approach previously used by the Consortium of Large Distributors (CLD)?

Answer: The evaluation methodology is likely different than that used by CLD. For those proposals that meet established government requirements, our goal is to rank the bidders in terms of "*best value*" and, as there are differences amongst consortium LDC's (in terms of meter types and populations, distribution systems, and goals for value-added functions) the rankings will be specific to each LDC. An example evaluation outcome is depicted in Table 4-1 below.

Table 4-1, Example Best Value Rankings (Per LDC)

	LDC "1"	LDC "2"	…	LDC "21"
Highest ranked	Bidder B	Bidder A	…	Bidder B
2nd highest ranked	Bidder D	Bidder C	…	Bidder E
3rd highest ranked	Bidder E	Bidder D	…	Bidder A
:	:	:	:	:
Lowest ranked	Bidder A	Bidder B	…	Bidder C

In the example, for LDC "2", bidder "A" is ranked highest in terms of "*best value*", bidder "C" is ranked second, bidder "D" is ranked third, and bidder "B" last. Other LDC's will have different "*best value*" rankings using the same evaluation methodology.

Pursuant to the provisions of Section 7.5.14, *Final Contract Negotiations*, of the RFP, LDC "2" would commence Statement of Work negotiations with bidder "A".

Question #6: Would you consider different solutions for electrical and water / natural gas meters?

Answer: Many LDC's, such as London Hydro, have traditionally read water meters and billed consumers for water consumption on behalf of the City (or municipality) on account of the operational cost savings attributable to leveraging resources (meter readers) and systems (billing systems, postage, etc.). The Ministry of Energy has recognized this synergy with the inclusion of Section 2.14, *Water or Natural Gas Meter Reads*, in their *Functional Specification for an Advanced Metering Infrastructure*.

However, the ultimate decision regarding AMR functionality for water or natural gas meters will be made by the city or municipality (and not the LDC) based on the maturity and robustness of the technology offered and the costs (in terms of initial investment cost and recurring operating costs).

The City is a participant in London Hydro's Smartmetering project to explore opportunities for sharing communications infrastructure and thereby provide automated reading of water meters. Whilst a full-scale deployment of electric meters is mandated, a proof-of-concept limited deployment of water meters is envisioned.

Figure 4-1 (which was presented as Slide #30 at the Bidders' Conference) indicates two (2) means by which water (or gas) AMR can be achieved via shared communications infrastructure.

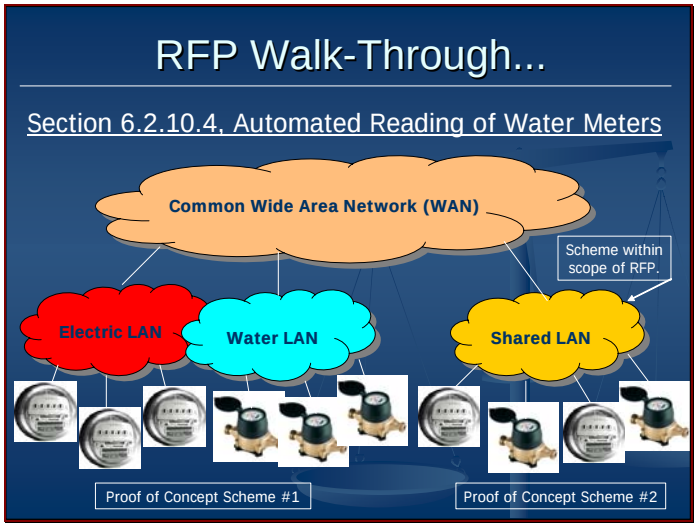

Figure 4-1, Alternative Shared Communications Schemes

There are other water AMR options that are completely independent of London Hydro's Smartmetering AMI.

At the end of the day, there are pro's and con's for each system architecture, and the City (or municipality) will make a water AMR technology selection based on what is best for their circumstances.

Note: It would seem that, to meet clause 2.14.1 of the Ministry of Energy's functional specification, the electric AMI has to be scalable (in terms of Master Control Computer addressing, communications system bandwidth, and regional collector addressing) to accommodate future water or gas AMR, even though the city or municipality may ultimately elect a different solution.

Question #7: When do you expect the Phase II Smartmeter deployments to commence?

Answer: Phase II is dependant upon several factors, namely how quickly after contract award the successful bidder can provide revenue meters, the installation timeframe for Phase I meters (see Section 5.1 herein for guidance), the successful completion of AMI acceptance testing (see Section 6.6 in the RFP document), and the customer's opinion as to whether the Phase I was a "first rate" deployment – refer to the definition in Section 5.2 of the RFP. Given the government's full deployment target of 2010, it is not in London Hydro's interest in delaying Phase II for "first rate" deployments.

Question #8: Is London Hydro governed by the Municipal Freedom of Information and Protection of Privacy Act (MFIPPA)?

Answer: Yes.

Question #9: Will you consider a partial response to the RFP / Information Supplement?

Answer: It isn't entirely clear what the bidder has in mind with this question, but any part system would certainly have to have end-to-end functionality to be accepted.

Figure 4-2 is intended to illustrate two scenarios that will hopefully distinguish between what is and isn't acceptable. In the one case, the bidder doesn't accommodate the full range of revenue meter types required, but does offer connectivity and meter reading data transfer from the meter to the provincial MDM/R – this part system is shown within the yellow-coloured rectangle.

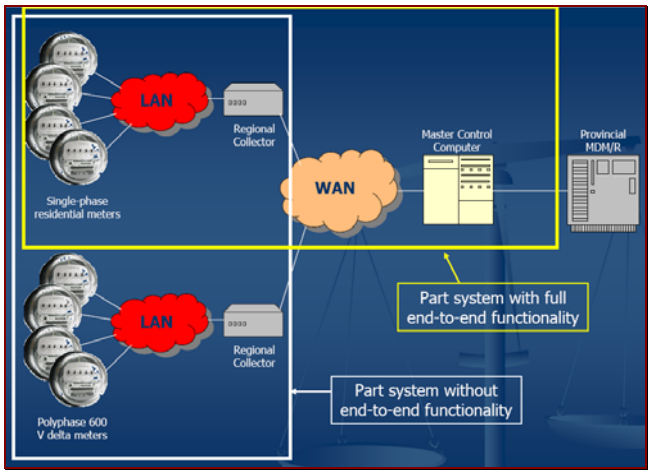

Figure 4-2, Two Variants of Part-AMI System Offerings

In another case, the bidder offers regional collectors and the complete spectrum of revenue meters required, but has no upstream offerings (e.g. master control computer, connection to MDM/R, etc.) at this time – this part system is shown within the white-coloured rectangle.

The part AMI system that offers end-to-end functionality would be considered in the evaluation. However, bidders need be cognizant that LDC's do in fact need a full solution. To provide a proper evaluation, the cost of another AMI system that provides complementary functionality would have to be added to the bidders cost proposal to derive a true system ownership cost.

Question #10: In case you select multiple vendors (under the provisions of Section 1.2, *Multiple Awards*, of the RFP), who will be the integrator between vendors?

Answer: The answer to this question will be more apparent after the answer to the previous question has been reviewed. Under a multi-vendor scenario, each system would have to provide end-to-end functionality (i.e. in reference to Figure 4-2 above, there would be two distinct Master Control Computers, each communicating with the provincial MDM/R), so it is not clear that any system integration would be required.

Question #11: Will London Hydro consider providing Master Control Computer hosting services to other LDC's as the "third-party" described in Section 2.13 of the Information Supplement?

Answer: There are several answers to this question, but it is probably premature to provide an answer that provides specific guidance to bidders preparing their proposals. Specifically:

- London Hydro would be willing to provide hosting services for other LDC's (on some type of mutually agreeable shared cost model) provided it was practical, meaning that both LDC's selected the same AMI solution.
- There are undoubtedly other LDC's in the consortium that would willingly provide hosting services, but again there is the matter of practicality – both would have had to have selected the same AMI solution to make this a cost-effective approach.

Question #12: With respect to Slide #17 from the bidders' conference presentation (replicated below for convenience of reference), can you tell us how may technical points are awarded for including demonstration of interoperability in Phase I?

Answer: A description of the evaluation factors that will be used in evaluating proposals and their relative weight in the overall evaluation is included as Table 7-1, *Proposal Evaluation Weightings*, of the RFP document.

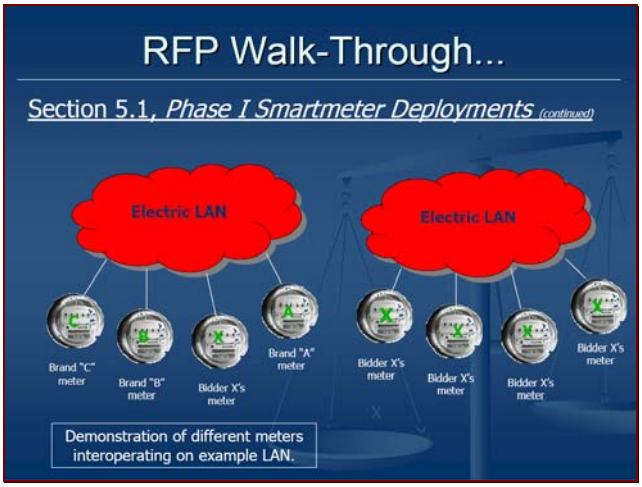

Figure 4-3, Slide #17 from Bidders Conference Presentation

However, a breakdown of technical points per section of the RFP will not be disclosed to bidders (nor is it disclosed to the Bid Evaluation Technical Panel until after the closing date for proposals). Bidders should be rest assured that the evaluation criteria are fair and that all proposals will be evaluated in the same manner, using the same process, and by the same people.

Certainly one of the purposes of the Bidders' Conference was to highlight important requirements that bidders might otherwise have overlooked.

Question #13: What consideration will the Smartmetering consortium give to Smartmeters that aren't yet listed in Measurement Canada's *Notice of Approval* database?

Answer: Each case will be considered on its own merits; however some guiding principles can be shared with bidders, specifically:

- From the Smartmeter consortium's perspective, the least-risk situation would be one whereby a well-established revenue meter has previously received Measurement Canada approval for a number of under-the-glass AMR interfaces, the latest submission to Measurement Canada is simply for a different under-the-glass AMR accessory, and there is reasonable belief (from the meter manufacturer's official submission date) that the project is well-advanced in Measurement Canada's approval queue.
- Conversely, and again from the Smartmeter consortium's perspective, the highest-risk situation would be one whereby the bidder is using this project to break into the Canadian marketplace with their Smartmeter technology, don't have NOA's for any other electricity meters (and are hence likely unfamiliar with the approval processes and requirements), and don't have a pending application before Measurement Canada.
- It can be seen from the various tabulations within Section 6.1.7, *Existing Meter Populations and Installation Densities*, of the RFP and Section 2.10, *Revenue Meters within Scope of Provincial AMI Specification*, of the Information Supplement that the timely availability of four (4) revenue meter styles would facilitate rapid field deployment. If LDC's had to wait a number of months for some less commonly used meter styles (e.g. single-phase, 2-wire, 120 V, self-contained), this would be something that LDC's could work around.

In summary, bidders need to appreciate that these aren't "proof of concept" or "pilot" projects. The provincial government has established short time-lines in which LDC's are to deploy successful AMI systems.

Question #14: How will the discretionary value-added functions be evaluated?

Answer: Recall from Table 2-34, *Variations in LDC Priorities in Additional AMI Functionality*, of the Information Supplement that each consortium LDC has made different choices in regard to the value-added functions. The inclusion of value-added functions will be optimally done to maximize each bidder's value proposition. A simple example (using grossly fictitious prices and a simplified formula) is offered to assist explanation of the underlying methodology.

Assume for example that, prior to consideration of the discretionary value-added functions, a bidder has scored 800 technical points and the evaluated system cost is $200, i.e. the LDC is receiving 4 technical points for each dollar invested. If a discretionary value-added function has been assessed at 20 technical points and is being offered for an adder price of $4, this function would be included as it provides 5 technical points for each dollar invested and hence improves the bidder's overall value proposition. Conversely if the adder price were $8, the function would not be included as it provides only 2½ technical points for each dollar invested and would reduce the bidder's overall value proposition.

As part of Statement of Work negotiations, LDC's may elect to include some value-added functions that were excluded from the optimization process based on perhaps fulfilling future business objectives whereby the benefits are difficult to explicitly quantify.

Question #15: With reference to Section 6.2.8.5, *Integration with London Hydro's Corporate Computer Systems*, (on page 56); is London Hydro looking for pricing on the system integration services associated with these "*mandatory functionality*" interfaces to their corporate computer systems in the RFP? If so, more details would be required before any such system integration pricing could be given.

Answer: No. At this point in time, we only want to understand which method bidders have previously implemented for exchanging data with an Outage Management System (OMS), an Automated Mapping / Facilities Management (AM/FM) system, or both. At a later stage of the project, when the OMS is in-place and ready to be tested, it is likely that the successful bidder would be engaged to participate in some type of system integration testing, but this activity would be handled under a separate "professional services" contract.

Question #16: With reference to Section 7.5.11.1, *Software Elements*, (on page 87); please clarify the statement "*Bidders shall provide all software elements, …, used in their proposal submission.*" What is the intention of London Hydro?

Answer: Basically we want a fully-functional system delivered by the successful bidder. I will try and create an example from the home-computer world to better explain. What isn't desired is for the bidder to propose a Brand X workstation running a Windows operating system and the bidder's special-purpose program, but then advising us that if we want to store data, we'll need to procure Access, if we want to generate reports, we will need to procure Crystal Reports, if we want the user to interact with the program, we will need to acquire Visio, and if we want to transfer the information to an external entity, we will need to acquire Citrix. The

bidder's offering should include the licensing costs for all these third-party elements as well as other pertinent ongoing maintenance cost information, e.g. for some virus scanning programs, there is an initial licensing cost and then a recurring annual fee for obtaining virus definition updates.

Question #17: With reference to Section 5.1.9, *Free Issue Single-Phase Self-Contained Revenue Meters (2007 Programs)*, (on page 20); please define the term "*free issue*".

Answer: Free issue is a term that is probably more meaningful to the LDC's than bidders. Basically, what we are saying is that while we have identified eight (8) geographic areas (described in Sections 5.1.1 through to 5.1.8) where we plan to mass Smartmeter deployments (which will include establishing end-to-end communications between these meters and the provincial MDM/R), to improve our overall Smartmeter deployment effectiveness, we need some skids of Smartmeters available to install in other locations (as set forth in Section 5.1.9) that are likely randomly distributed throughout the service territory. For this latter case, if by chance, the Smartmeter is within range of an existing regional collector, it will be read via the AMI system. If it is too far away from any regional collectors, then the meter will be manually read until Phase II or a later project phase.

5. INFORMATIVE

The information given herein is supplementary to the governing *Request for Proposal* or *Information Supplement*. It is intended to assist bidders in preparing their proposals, but does not override, amend, nor change any of the requirements stated in the baseline documents.

5.1 Phase I Smartmeter Deployment Timeline

Some bidders have asked for a general timeline for the Phase I Smartmeter deployments described in Section 5.1, *Phase I Smartmeter Deployments*, of the RFP.

London Hydro would certainly be augmenting our own staff with qualified contractors (refer to Section 5.3, *Optional Supply of Qualified Installation Labour*, of the RFP) to carry out Phase I deployments in an expeditious manner. The following guidelines may be useful to bidders:

Table 5-1, Productivity Assumptions for Phase I Smartmeter Deployments

RFP Section	Anticipated Meter Exchange Rate
5.1.1	60 network meters per day for a 2-person crew
5.1.2	45 single-phase meters per day for a 1-person crew
5.1.3.1	3 days in total for 1 person (access issues will require re-visits)
5.1.3.2	45 single-phase meters per day for a 1-person crew
5.1.4	60 polyphase meters per night for a 2-person crew
5.1.5	2 days in total for a 2-person crew
5.1.6	2 days in total for 1 person
5.1.7	45 single-phase meters per day for a 1-person crew
5.1.8	3 days in total for 1 person

Note: Aside from end-to-end testing the AMI technology in various environments, one of the purposes of the Phase I deployment is to familiarize staff with new products and installation techniques (for which training will be provided pursuant to Section 6.5 of the RFP), and to remedy any start-up glitches associated with the provisioning and diagnostic tools (as outlined in Section 6.3.6 of the RFP). As such, the actual meter exchange rates may be less than indicated in Table 5-1.

London Hydro has no insight as to the availability of qualified contractors to carry out this work – unless bidders have information to the contrary, they should assume that no more than six (6) qualified contractors would be available to complement London Hydro's staff for a Phase I deployment team of ten (10) persons in total.

5.2 Franchise Service Territory

Some bidders have asked for service area maps indicating each consortium LDC's franchise service territory to augment the information included as Section 6.1.2, *London Hydro's Franchise Service Territory*, of the RFP and Section 2.6, *Franchise Service Territory*, of the Information Supplement. It has been indicated that a red-line on a Google Earth background would be adequate for the purposes.

This information is being prepared and will be disseminated to bidders as soon as possible.

5.3 A-Base to Socket Adapters for Socket-Style Revenue Meters

Some bidders have asked if consortium LDC's would consider using A-base to socket adapters if a bidder only had Smart meters in a socket-style configuration.

London Hydro has successfully used Ekstrom Industries' *type SHD* single-phase heavy-duty "A-base to socket" adapters (model #SHD-3W-SP4321) for such applications in the past and would consider them for use with the Smartmetering initiative. Similarly the *type PHD* adapters have been used for network and polyphase meter applications.

The cost of such adapters (where required) will be built into our "system most probable cost" analysis, one of the bid evaluation steps. As such, bidders that are able to obtain favourable pricing for this accessory may wish to include this accessory as an "adder price" under the "Revenue Meter Cost Elements" section of Appendix D.5, *Price Proposal and Cost Elements*.

5.4 Automated Reading of Water Meters

Some bidders have asked about the proximity of water meters and natural gas meters to the electric meter in typical residential dwellings. In a typical residential dwelling:

- For older homes, unless there has been a service upgrade, the electric meter will be located indoors, and most likely in the basement. For the past half century, utilities have required electric meters to be installed outdoors. Most often the meter is installed at the side of the building, near a rear corner – see Figure 5-1;
- The natural gas meter will normally be located outdoors (although it is understood there are some indoor gas meter installations on vintage homes in London), most often at the side of the building, near a rear corner – see Figure 5-2; and
- The domestic water meter will certainly be located indoors to prevent freezing, most likely in the basement at the front and centre of the building. Over time, the building owner will finish that part of the basement and conceal the water meter – see Figure 5-3.

Figure 5-1, Electric Meter at Rear Left Corner of Dwelling

Figure 5-2, Outdoor Gas Meter at Rear Right Corner of Dwelling

Figure 5-3, Domestic Water Meter in Finished Basement

It is probably safe to assume that neither the natural gas meter nor domestic water meter is located in close proximity to a source of 120 Vac supply or a telecommunications / CATV access point.

5.5 Penetration of Remote Read-Out Units for Domestic Water Meters

There are two classes of remote read-out units, generally used for flow meters such as domestic water meters, that are usually installed adjacent the electric revenue meter and the allow the water meter reading to be taken from outside the house:

- A remote water meter register – a special head on the water meter generates electrical pulses that advance a remotely-located register unit consisting of rotating display wheels, much like the odometer on a car. The signal wiring interconnecting the water meter and remote register is a 2-wire arrangement.
- A remote reader (also referred to as a "touch pad") - a remotely-located "touch pad" is wired to a special "encoder" head on the meter. When the meter is to be read, the meter reader places a probe near the pad. Both the probe and the touch pad contain a coil, which comprises one-half of a transformer. The probe transfers energy to the pad, which provides operating voltage and "wakes up" an integrated circuit in the meter. The encoder provides the dial position information, which the integrated circuit converts to a serial data stream. The data is transmitted to the touch pad, where it is received by the probe and sent to the handheld. The signal wiring interconnecting the water meter and remote touch pad is a 3-wire arrangement.

The City of London started providing remote read-out devices on homes in the early 1980's. At present, there are approximately 46,700 remote read meters that use a 2-wire system. In 2005 the City of London started installing only encoder-read meters for replacement and new construction, and currently has approximately 13,650 3-wire encoder-read meters. The remaining meters (~42,650) are all direct read.

5.6 Local Meter Data Management / Repository

Some bidders have asked about augmenting the AMI Master Control Computer with local Meter Data Management Repository functionality as a medium for both (i) eliminating the transfer of data to and from the provincial MDM/R, and (ii) supporting the desired value-added customer service and operational functions.

While such an architecture is certainly used in other jurisdictions, bidders need to be cognizant of the prevailing regulatory constraints. Specifically, excerpts of Clause 2, *Cost recovery, meter data functions*, of Ontario Regulation 426/06, *Smart Meters: Cost Recovery*, have been replicated below for convenience of reference:

> (1) No distributor shall recover any costs associated with meter data functions to be performed by the Smart Metering Entity.
> :
> (3) Subsection (1) does not prevent distributors from recovering costs that are approved by the Board pursuant to section 1 that are associated with functions related to meter data that relate to a distributor's operation of its distribution system, but only if those functions are not meter data functions to be performed by the Smart Metering Entity.
> :
> (5) In this section, "meter data functions" include the verification, validation and editing of meter data received from distributors, the processing of meter data into data that is ready for

billing purposes, the aggregation of meter data into rate periods and the storing and managing of meter data.

Note: With respect to subsection (1) above, Ontario Regulation 393/07, *Designation of Smart Meter Entity*, named the Independent Electricity System Operator (IESO) as the Smart Meter Entity with provincial responsibilities for MDM/R functionality.

While the centralized MDM/R model is intended for customer billing and will work well for that purpose, it is evident that the effective turn-around time on metering data transmitted to and from the MDM/R is inadequate to support the near real-time requirements of value-added functions such as outage management systems (OMS), remote disconnect, quality of supply voltage reporting, demand management, etc. Clearly some type of local data-base management system (DBMS) will be required to support these value-added functions.

To avert potential confusion amongst the Bid Evaluation Technical Panel, it strongly suggested that bidders use the acronym MDM/R to refer to the provincial entity and the functions performed by that entity, but adopt another acronym (such as LDBMS, for local data-base management system) to refer the metering, network and condition data stored locally to support the value-added functions.

- End of Addendum #1 -