

ONTARIO ENERGY BOARD

IN THE MATTER OF the *Ontario Energy Board Act, 1998*, S.O. 1998, c.15, Schedule B;

AND IN THE MATTER OF an application by Toronto Hydro-Electric System Limited for an order approving just and reasonable rates and other charges for electricity distribution to be effective May 1, 2010

**INTERROGATORIES OF THE
SMART SUB-METERING WORKING GROUP (“SSMWG”)**

Load and Revenue Forecast

Issue 2.1: Is the load forecast and methodology appropriate and have the impacts of conservation and demand management initiatives being suitably reflected?

Reference: K1/T1/S1, p. 10, Table 5

1. THESL includes the actual individually-metered suite numbers for 2007 and 2008, and forecasts for 2009 and 2010 for new individually-metered condominium suites, and condominiums converted from bulk metered to individually-suite metered units (Table 5).
 - (a) Please provide a breakdown between the number of new versus converted condominium suite meters installed in each of the years identified in Table 5.
 - (b) Does THESL offer suite metering to commercial properties? If so, does Table 5 include any meters installed in commercial applications, and if so, how many in each year?
 - (c) Of the 4,964 individually-metered suites (cumulative) forecast for the end of 2009, what percentage or number are forecast to be revenue generating at the end of 2010? Does THESL adjust its revenue forecasts to reflect the fact that some of the forecast metered suites will not be revenue producing in 2010?
 - (d) If the answer to (d) above is No, are there individually-metered suites which are not included in any of the individual year and cumulative numbers in Table 5 because they are not forecast to be in service in any of the subject years?
 - (e) When does THESL count a newly constructed (i.e. not a conversion from a bulk meter) individually metered suite as a customer? Does this occur when the meter is installed, upon registration of the condominium's declaration, upon occupancy or at some other time?

Reference: D1/T8/S7, p. 3 and K1/T1/S1, p. 10, Table 5

2. THESL states, at D1/T8/S7, p. 3, that in consideration of anticipated requests for THESL to provide both new and existing condominium buildings with individual suite metering, the forecasted capital spend is \$2.4 million in 2010, for a total of 5,400 individual-suite meter installations.
 - (a) Please reconcile this with Table 5, which contemplates an increase in individually-metered suites on a cumulative basis of only 3,600, in 2010.
 - (b) What is the number of suite meters which THESL has used for 2010 for the purposes of developing its revenue forecasts?

Operations, Maintenance and Administration Costs

Issue 3.1: Are the overall levels of the 2010 Operation, Maintenance and Administration budgets appropriate?

Reference: D1/T3/S1, p. 3

3. THESL forecasts an increase in distribution expenses of \$21 million in 2009, in comparison to 2008 Historical. The pre-filed evidence states: "The increase is primarily due to higher operations costs due to an expanding workforce and an increase in external vendor costs related to suite metering."

Please provide:

- (a) The actual external vendor costs relating to the Suite Metering Program for the years 2008 and 2009 (to date), the forecast external vendor cost in 2009 and 2010, broken down between payments on account of OM&A and payments on account of capital (e.g., costs to purchase and install suite meters);
- (b) In each of the above years, please advise of the actual number of suite meters installed or forecast (whether operational or not) for which payment was made to the external vendor.
- (c) Please confirm that the external vendor used for the suite metering program is Trilliant.
- (d) Please advise how the customers of Trilliant, a licensed sub-metering company, have been treated? Have these customers been transferred to THESL and if so, are they part of the suite metering customer count at K1/T1/S1, p. 10, Table 5? How many customers were transferred and what are financial details of the transfer?

Reference: F1/T7/S1, p. 3
D1/T8/S3-2, p. 3

4. THESL indicates that the installation of individual suite metering in condominium buildings will impact all areas of customer service including: (a) an increased number of customer concerns and billing queries to the call centre; (b) increased postage costs, bill mailings and remittance transactions; (c) increased meter installation updates; and, (d) additional collections for outstanding payment.
- (a) Has Toronto Hydro undertaken a study to determine the difference in cost, on a fully allocated basis, to serve a condominium suite under the suite metering program versus the cost to serve other residential customers? Please provide a copy of any study, analysis or calculations, including any assumptions and data relied upon?
 - (b) What is the average cost to serve residential customers on a fully allocated basis?
 - (c) Please produce any analysis or documentation which may indicate that the cost to serve an individually-suite metered customer is more or less than the fully allocated average O&M cost to serve residential rate class 1 customers.
 - (d) Please produce any analysis or documentation which may indicate that the cost to serve an individually-suite metered customer is more or less than the average O&M cost to serve rate class 1 customers of \$178.21 (2009 Bridge) and \$190.30 (2010 Test).

Reference: D1/T8/S7, p. 3
 K1/T1/S1, p. 10, Table 5
 F1/T7, S1, p. 6
 F1/T7/S2, pp. 3, 4

5. THESL forecasts individually-suite metering 5,400 individual units (new and converted buildings), yet at Table 5, it calculates an addition of only 3,600 units in 2010. THESL states that the majority of the work relating to the installation, commissioning and maintenance of condominium suite meters is performed by an external contractor.
- (a) What is the actual number of metered units used by THESL for the purposes of developing its OM&A forecasts for 2010?
 - (b) What is the total amount in the OM&A forecast for 2010 that relates to individual suite metering?
 - (c) What are the fully allocated internal costs (excluding payments to third party vendors) that THESL forecasts it will incur in 2010 for suite metering?
 - (d) Please calculate the fully allocated internal costs (excluding forecast payments to third party vendors) that THESL forecasts it will incur in 2010 for suite metering. Please confirm that all costs are calculated on a fully allocated basis and that such costs include: (a) software licence and maintenance costs; (b) network and communications management system O&M; (c) technical and non-technical training; (d) third party vendor negotiations, communications and management

costs; (e) advertising, promotional, government relations costs; (f) regulatory costs; (g) all other implementation and ongoing operational costs; and (f) depreciation.

- (e) What are the rates of depreciation that THESL uses in respect of the Suite Metering Program?
- 6. Please produce a copy of all brochures, postcards, posters, and/or other information available in hard copy or on-line (including copies of all Web page screen prints) provided or available to developers, building owners, or condominium corporations that promote, explain or deal with the suite metering program.
- 7. Please provide a copy of all offers, contracts, agreements, undertakings, or other documents which THESL requests that condominium developers and/or condominium corporations execute, or any terms and conditions which THESL deems to be in effect where a developer or condominium corporation agrees that THESL may undertake suite metering in a building.
- 8. Please provide a breakdown of the total amounts actually spent on the Suite Metering Program in 2007 and 2008, to date in 2009, and the forecast for 2009 and 2010. Please provide for each of these years the number of buildings in which suite meters were installed or are forecast to be installed?

Reference: F1/T7/S1, p. 5, Table 1

- 9. THESL identifies its total customer service costs for each of 2008, 2009, and 2010. Please confirm that these numbers do not include external third party customer costs associated with customer services for suite-metered condominium units.

Capital Expenditures and Rate Base

Issue 4.1: Are the amounts proposed for rate base appropriate?

Issue 4.2 Are the amounts proposed for 2010 capital expenditures appropriate, including the specific operational and emerging requirements categories?

Reference: D1/T3/S2, p. 7

- 10. Service and meter assets will increase between 2008 and 2010, from \$246.3 million to \$274.8 million. The variance primarily relates to wholesale meter compliance, full compliance with the Smart Meter Initiative, and “implementing suite metering in bulk metered condominiums”.

In respect of the implementation of suite metering in bulk metered buildings, please provide the following:

- (a) the amount THESL has closed to rate base or the amount for which THESL seeks approval to close to rate base for 2007 and 2008 and 2009 (if any) by year;
- (b) the forecast capital spend by Toronto Hydro in 2010 to suite meter bulk metered buildings;
- (c) the number of units individually metered (actual or forecast) in each of the years 2007 through 2010 in formerly bulk metered buildings;
- (d) an explanation as to how THESL has forecast its capital spend for 2010, including:
 - (i) the number of condominium units that are currently bulk metered which are eligible for conversion;
 - (ii) the percentage of the available bulk metered market which THESL estimates it will capture in 2010.

Reference: D1/T7/S1, p. 19, Table 2
K1T1/S1, p. 10, Table 5

11. THESL indicates, at Table 5, an installation of 2,705 (actuals) individually-metered suites (cumulative) at the end of 2008. Table 2, being the summary of THESL's capital budget, indicates Nil for suite metering for 2008.
- (a) Please explain the above apparent inconsistency;
 - (b) Please advise of the total capital cost to acquire and install (including any third party vendor costs) the 2,705 suite meters installed by the end of 2008.
 - (c) Has THESL closed to rate base any of these capital costs and/or is it seeking approval to close to rate base these costs in 2010?

Reference: D1/T7/S1, p. 19

12. THESL's summary of capital budget includes a budget of \$1.8 million for 2009, and \$2.4 million in 2010 for its Suite Metering Program. Please advise of the average capital cost to acquire and install suite meters in each of 2009 and 2010 for each of: (a) new condominiums; and (b) bulk metered condominiums being converted to individual suite metering. What are the forecast numbers for each type? Please advise if there are any additional costs which THESL may contemplate capitalizing in respect of these meters in subsequent years.
13. (A) Please provide a breakdown of the type of capital costs included in THESL's budget of \$1.8 million for 2009, and \$2.4 million in 2010, for its Suite Metering Program. Please advise whether these capital budgets include any allocation of the costs

associated with related capital expenditures, including, to the extent applicable, the following:

- (i) local area network components;
- (ii) wide area network or backhaul;
- (iii) field data collection devices and back office software;
- (iv) data protection security system;
- (v) network management system or meter infrastructure head-end
- (vi) meter data management system
- (vii) costs associated with any other IT component which serves the Suite Metering Program such as, for example, necessary modifications to the billing system;
- (viii) other applicable capital accounts.

(B) To the extent that any of the above capital costs are not included in the capital budgets of \$1.8 and \$2.4 million for 2008 and 2009, please provide your best estimate of the appropriate amount to allocate in respect of such costs to the Suite Metering Program.

14. What is the amount, if any, which THESL forecasts it will pay to its third party suite metering vendor in each of 2009 and 2010, which it may or is seeking to capitalize?
15. THESL produced, in EB-2007-0680 a business plan for its Suite Metering Program, entitled "Draft - Project Plan for Individual Suite Metering in Condominium Buildings". A copy of this business plan was filed on November 12, 2007, in response to VECC Interrogatory 9 during this proceeding. A copy is attached to this interrogatory for convenience of reference.

Please advise as follows:

- (a) Has this business plan been updated, or has THESL prepared a new or revised business case or plan in respect of condominium suite metering? If so, please produce copies of same.
- (b) Does THESL contemplate undertaking suite metering in any *Residential Tenancy Act* buildings (new and/or to be converted) in 2010? If so, how many, and what is THESL's forecast of the total cost to suite meter these buildings? Does THESL seek recovery or plan to capitalize and request approval to clear to rate base any amounts associated with the installation and operation of suite meters in *Residential Tenancy Act* buildings in 2010?
- (c) Please provide an update in respect of the following areas identified in the attached business plan:

- (i) Does THESL continue to estimate that there are close to 300,000 existing condominium suite candidates for individual suite metering? If not, what is THESL's current estimate?
- (ii) The Table, at page 8 of the attached business plan, provides the total cost and cost per suite (based upon the assumptions stated in the plan) for bulk metering, individual smart meters, and integrated electronic smart metering. Please update the figures in this Table using the best information currently available. For the integrated electronic smart metering costs, what is the average cost per suite forecast for 2010.

Reference: D1/T8/S3-1, p. 3
D1/T8/S3-2

16. THESL's Conditions of Service state, at Clause 2.3.7.1.1, that it will provide electronic or conventional smart suite metering for each unit of a new multi-unit site, or condominium, at no direct charge to the customer.

Please advise:

- (a) Whether THESL provides electronic suite metering in bulk metered condominium conversion projects at no cost to the condominium corporation and/or unit owners;
 - (b) Does THESL undertake an economic evaluation pursuant to the *Distribution System Code* in respect of bulk metered buildings looking to be individually suite metered? Does THESL adjust its revenue forecast in respect of such buildings to account for the expected decrease in load due to the conservation impact of the building being suite metered?
 - (c) In respect of new condominiums, does THESL exclude the costs to acquire and install suite meters in its economic evaluations undertaken pursuant to the *Distribution System Code*?
 - (d) If the answer to (b) is Yes, if the acquisition and installation costs of suite meters had been included in the economic evaluations, are there any developers or condominium corporations that would have been required to make a capital contribution in aid of construction?
17. If the 3,600 condominium suites that THESL forecasts suite metering in 2010 were in fact suite-metered by a licensed smart sub-meterer, would THESL's forecast of capital contributions from the developers of the very same buildings be affected? Please explain your answer, and identify whether the change would be an increase or decrease in the forecast recovery of capital contributions.
18. Has THESL, in 2008 and 2009, provided orally or in writing an offer to connect to a new condominium developer that contemplates the developer paying no capital contribution where THESL suite meters the building but requires the developer to pay a capital contribution should the developer contemplate using a licensed smart sub-metering provider to smart sub-meter the building? Please produce a copy of all such offers to connect and the economic evaluations undertaken in support of same.

19. Please confirm that no costs (OM & A and capital) associated with the suite metering program have been allocated to or form part of any of the costs incurred or forecast by THESL in respect of its Smart Meter Program?

Cost Allocation and Rate Design

Issue 7.1: Is Toronto Hydro's cost allocation appropriate?

Reference: L1/T2/S1, p. 11

20. Please identify each of the four meter types referenced under Column 1 "Residential" in this Exhibit. Please advise which meter type relates to the meters used for THESL's Suite Metering Program. If the suite meters are included under the "LDC Specific 2" meter type, please explain the total number of meters included at 31,275.

VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

1 **INTERROGATORY 9:**

2 **Reference(s):** D1 T7 S1 Page 10 Table 1

3 D1 T8 S3-2 Table 2

4 D1 T8 S5 Table 1

5

6 This question seeks information on THESL's plan for Smart Metering of condominium
7 and rental multifamily buildings.

8 a) Provide a copy of the plan for smart/individual metering of condominium and other
9 multifamily buildings.

10 b) Are these units included in D1T8S5 Table 1? If so provide a version of the table
11 showing the breakout. If not respond to question c) below.

12 c) Provide a capital budget profile in the same format as Table 1 for the condominium
13 and rental multifamily buildings SM capital plan. Distinguish condominium from
14 Market rental units.

15 d) Provide a breakdown (2006-2010) of Smart Meter costs between meter- related
16 (capital and operating) and back office capital and operating costs.

17

18 **RESPONSE:**

19 a) Please refer to "DRAFT Project Plan for Individual Suite Metering in Condominium
20 Buildings" provided as Appendix A of this Schedule.

21

22 b) No, individual suite meters are not included in Table 1 of Exhibit D1, Tab 8, Schedule
23 5.

VULNERABLE ENERGY CONSUMERS COALITION INTERROGATORIES

- 1 c) Please refer to the Table provided in response to Board Staff interrogatory in Exhibit
2 R1, Tab 1, Schedule 4.7. All the suite metering tabulated as “Conversion of bulk-
3 suite metered buildings” are condominiums, as per Ontario Regulation 442/07.
4 THESL currently has no plans to convert market rental buildings.
5
6 d) Breakdown of Smart Meter costs between meter-related and back office is provided
7 below:

\$000s					
Cost	2006	2007	2008	2,009	2,010
Smart Meter Capital Expense	33,268	40,726	32,744	32,100	15,946
Back Office Capital Expense	842	2,943	3,463	2,467	1,697
Total Capital Expense	34,110	43,669	36,207	34,567	17,643
Smart Meter Operating Expense	526	1,288	1,690	2,024	1,818
Back Office Operating Expense		400	800	900	400
Total Operating Expense	526	1,688	2,490	2,924	2,218

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**Project Plan for
Individual Suite Metering
in Condominium Buildings**

Prepared by: Steve MacDonald

Updates by: David Grant

1. Executive Summary

In the spring of 2007, executive approval was given to develop plans for to offer individual suite metering services to condominium corporations. This decision was based on the draft regulations that would require all condominium buildings in Ontario to have individual suite metering by the end of 2010.

In mid-August, the final regulations were published, and the 2010 deadline was removed. This report was prepared to assess the implications of this significant change.

As a result of our reassessment, the number of condominium individual suite meters that we anticipate Toronto Hydro could install has been significantly reduced.

However, with regulatory approval, Toronto Hydro can still successfully offer individual suite metering to both existing and new condominium boards within our city.

We recommend that we proceed with the evaluation, selection and contracting with a suitable business partner to begin offer these services.

2. Background

When the six metropolitan Toronto utilities amalgamated in 1998, there were significant inconsistencies in metering practices for multi-tenant residential buildings. Some utilities did not allow individual metering, while it was mandatory or optional for others. Some utilities allowed individual metering but charged the developer for the meter costs, while others provided the service at no cost. To establish the consistent approach requested by developers and employees, a policy requiring bulk metering was established for all buildings with more than 18 tenants.

Initiatives such as conservation and demand management caused a review of this policy, and led to a policy change that allows individual metering, using traditional glass meters only. Although generally viewed as a positive step, property developers often elect to have a bulk meter point from Toronto Hydro and use a third party service provider to install sub-metering for individual units or suites. However, many developers have indicated that they would prefer to have the individual suite metering provided by Toronto Hydro, but only if an electronic metering product was offered. The advantages to the developer are primarily reduced space requirements and therefore increased retail opportunities. The latest Conditions of Service allow for the possibility of installing integrated electronic metering systems, but require evaluation by Toronto Hydro on a case-by-case basis.

The third party meter service providers have been offering terms that are attractive to developers, but may not be in the best long-term interests of the individual suite owners. In some cases, the terms included contracts of up to 25 years duration. The contract

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provisions offered by other service providers requires Toronto Hydro to develop a service package that is competitive, complies with regulatory obligations and doesn't compete at an affiliate company level.

In 2006, the Ontario government introduced draft regulations to require all new and existing condominium buildings to install individual suite smart meters. The draft regulations also addressed the need for licensing the meter service providers, but kept the concept of allowing competition for these services. The condominium community raised concerns about some of the provisions, especially the deadline to have all existing building converted by the end of 2010. In August 2007, the official regulations were published, and this deadline was removed.

A search of our Banner Customer Information System suggests that close to 300,000 existing condominium suites may be candidates to have individual metering installed (the number of cumulative suites in bulk metered buildings identified as "designated customers"). Converting these units to be individually metered will provide a significant conservation and demand management opportunity.

3. Installation Situations

There are several different situations where individual suite metering may be installed. Regardless of the building type, and type of metering installed, all existing requirements and processes will continue to apply, including:

- Compliance with all the other terms in Toronto Hydro's Conditions of Service
- Premise and customer account set-up completed by Customer Connection and Maintenance staff
- Individual account holders will become Toronto Hydro customers
- Toronto Hydro will provide all meter reading, billing, collection, and reconnect/disconnect activities (either directly or through contract services)

3.1. New Buildings / Developments

Developers currently have two choices for Toronto Hydro meter installations:

- 1) Traditional style meters, installed in meter centres or meter sockets. As per the existing Conditions of Service, the developer must provide:
 - all required meter sockets or meter centres
 - common area meter requirements (switchgear, meter cabinets, phone lines, etc.)
 - metering for all services required by building codes or standards (e.g. fire pumps)

Builders/developers in general will not be agreeable to giving up rentable space for the traditional meter installations.

- 2) Integrated metering, where the individual metering is installed downstream of the traditional metering location. Typically, the metering equipment will be integrated into customer-owned breaker panels or distribution boxes.

The developer will provide:

- a “bulk”, or whole load meter, to measure the entire load of the building
- metering for all services required by building codes or standards (e.g. fire pumps)
- all required mechanical interfaces for suite metering
- a single meter to measure all common area load
- all meter communication or data collection requirements (phone lines, network connectivity, etc.)

3.2. Retrofitting Existing Bulk Metered Buildings

Retrofits will likely be substantially more difficult and costly than to install individual metering in new buildings. Although there are no requirements that preclude property managers from installing meter centers or sockets, space limitations will likely require integrated metering to be used to convert buildings that are currently bulk metered to individual suite metering.

Installation space even for integrated metering will be an issue, since most breaker panel enclosures were not built large enough to house metering equipment. Perhaps more importantly, most suites, if converted from bulk to individual, will be double metered, and an adjustment process will be required to correct duplicate billing. The chance for incorrect billing is higher than usual in a retrofit situation.

For retrofit situations, Toronto Hydro will provide and arrange for installation of the suite metering. Equipment will be installed in existing customer-owned breaker panels or distribution boxes. The property manager may be responsible for any significant modifications required to install new metering equipment, and for the provision of all communication or network connectivity circuits, including conduit, where applicable.

The existing bulk meter will remain as a billing point. Common area load will be calculated by subtracting the aggregated total of the suite meters from the bulk point. Payment for the common area load will remain the responsibility of the existing account holder. All metering points will provide hourly interval data, with all meters time synchronized to allow for proper allocation of common area and suite metering costs.

3.3. Retrofitting Existing Individually Metered Buildings to Smart Meters

Existing individually metered condominium buildings will be relatively easy to upgrade to smart metering installations. Since the site requirements for meter

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installations already exist, the installation of the smart meters should consist of routine meter changes, and communication equipment installation. The appropriate technology selection will be the most challenging consideration. Each building will need individual assessment and analysis.

Property managers will be required to allow access during regular working hours to Toronto Hydro personnel. It is recommended that condominiums currently metered with traditional metering not be given the option to convert to integrated metering installations.

3.4. Existing Sub-Metering Systems

Customers who have an existing sub-metering system may approach Toronto Hydro to ask us to take over its operation. In these cases, we should presume that the metering equipment may be installed incorrectly, is a generation of technology no longer supported and is incompatible with our data collection systems. Also, the customers may have been billed incorrectly, and we could inherit numerous problem accounts.

Toronto Hydro should only assume the operation of these systems on the condition that the property owner/manager accepts all financial liability for making the technology compatible, and resolution of any existing billing errors.

3.5. Rental Buildings – New or Retrofit

The current regulations only require the installation of individual suite metering in condominium buildings, not rental units.

The majority of Toronto Hydro's unrecoverable ongoing bad debt comes from tenant accounts. For this reason, expanding our exposure to greater numbers of tenant accounts by installing individual suite metering in rental buildings is not recommended. Although a considerable number of condominium suites are rented out by their owners, the expected financial risks are greater with purely rental buildings.

4. Integrated Metering Technology Alternatives

A significant decision that we will have to make is how many systems, and therefore supporting software applications, we will approve for use.

Most integrated systems have similar construction, installation, and operational methods. The system consists of individual current transformers or transducers (CT) slipped around the service conductors that lead to each suite. One voltage source is taken from the breaker panel to a head end device, usually a transponder, and associated with the currents from each suite. The metering data is transferred to a

dedicated computer system on-site, which can be remotely interrogated by the utility from their billing office.

The choices of integrated technologies, each with one or more possible suppliers, are:

4.1. Mesh Technologies

Mesh technologies have been the mainstay of our residential smart meter deployment, and have been successfully deployed in some multi-unit buildings. Limiting factors include building age, construction technologies and lack of proximity to other buildings. Systems such as Elster's EnergyAxis are designed to broadcast the RF transmissions over a horizontal plane, so they work very well in single meter rooms, or when multiple meter rooms are on the same level. Testing of dwellings with horizontally located meter rooms has been mostly successful, and indications are that the system will work well for many applications. New products have been developed to extend the strength and range of signal broadcasting. There are occasions where the building construction type limits the communication success rate, and an alternate solution will be needed.

Based on cost, ease of installation, and integration with existing systems and processes, the mesh technology is a viable option for individual suite metering.

4.2. Power Line Carrier

Power line carrier systems operate by sending hourly data over the existing building wiring to a central receiver, or collector. The data in turn is collected from the collector by phone or LAN, using a dedicated data collection computer. Some power line carriers use meters that can directly replace the existing. Other systems require additional devices to assist in moving the data. Meters come in either traditional socket base configurations or with the equipment integrated into the dwelling units' breaker panels.

Power line carrier systems work well when there is only one voltage present in a building. However, most buildings have multiple transformation levels that can result in challenging data communications. The best of the current power line carrier systems can communicate through one level of voltage transformation. Power line carrier systems are also affected by open switches and supply point transfers. Data transfer rates, although often slower than other systems, should be adequate for the relatively small amount of data to be collected, and the system is always available for operation. Power line carrier systems provide excellent additional information with regard to outage reporting and restoration activity.

The comparatively high per point installation cost, coupled with the complexity of the installations and additional engineering and design considerations, can make power line a less desirable option. However, power line carrier systems remain a viable option for multi-suite buildings.

4.3. Point-to-Point

Point-to-point systems are ones where each meter sends its own hourly data back to the data collection computer. Vendors of this type of technology include SmartSynch, who manufacture third party cellular communication boards that are installed as part of a smart meter in a traditional metering package. Each meter operates independently of the others, and of any network operations. Meter attributes are tailored to customer billing requirements.

Point-to-point systems are easily installed, and will easily deliver all required data over an acceptable time period. The system is easily installed, although some installations will need specialized antenna solutions. The monthly communication costs will be higher, unless they can be bundled with other purchases from common service providers. The system may also have a less than acceptable communication rate for some installations that are below grade or inside steel cabinets.

5. Operations

Toronto Hydro's implementation of individual suite metering will require significant changes to our operations and business processes. These processes include: business development and promotion, property manager /developer liaison, customer communications, account set-up, metering equipment purchase and installation, contracting for communications facilities and services, installation testing and commissioning, ongoing maintenance and failure response, customer inquiries and billing questions.

Initially, meter reading and data collection will necessarily be done using a third party service, who will read the meters daily, provide hourly interval data in a manner suitable to Toronto Hydro, and investigate all meters where collected data is not suitable.

The initial installation will also likely have to be done by a third-party contractor, because our present metering staff doesn't have the skill sets or experience to install this type of metering. More importantly, our staff does not have the required licence or ESA certification to work on customer-owned equipment, which is where this type of metering will be installed. However, our staff should be given appropriate training and assigned to spot-check the installation process as a quality assurance function. They should also oversee the commissioning of the central metering equipment at each installation site.

Meter maintenance will likely be an issue, as many systems require on-site testing and certification, for which we currently don't have processes, tools, or skill-sets. If we are able to limit the number of different systems we are required to support, it should be feasible to develop our existing metering staff to troubleshoot and maintain these systems. Again, we will have to rely on a third party initially.

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Account set up will be the most difficult part of the billing process. We need much information from customers, and will apply the same credit checks and deposit policy as we would for any other residential customer. As with all of our existing customers, when time-of-use rates are applied, the volume of inquiries is expected to be significantly higher. Billing dispute resolution will be a challenge, primarily because of on-site testing requirements, and the unfamiliarity of the regulator with many of the systems.

Toronto Hydro will have to ensure that the meter reading, data and presentment capabilities meet all of the regulated requirements, including the MDM/R, IESO, and Ministry of Energy rules that will be introduced.

6. Financial

The per point price for integrated metering costs substantially more than traditional metering, so cost recovery for capital expenses will take longer. To be competitive with other metering service providers, Toronto Hydro will need to provide individual unit integrated metering at no cost to the developer or condominium corporation. Ongoing operating costs will need to be recovered through our standard customer service charges.

There are benefits to Toronto Hydro in having more condominium buildings with individually suite metering. It will make our costs per customer more comparable with other utilities that do not have significant numbers of bulk metered customers.

Typical costs for a new, 250 suite, non-electrically heated condominium:

Assume there is one primary service, 347/600 V., 3000 A. Peak demand for the building is 1800 kW. The building has the following features:

- in-suite air conditioning
- indoor pool and recreation facility
- in-suite washers and dryers
- underground parking with ramp heating

Alternative Metering Installations	Total Cost	Cost per Suite
Bulk Metering	\$3,500	\$14
Individual Smart Meters	\$40,000	\$160
Integrated Electronic Smart Metering	\$137,500	\$550

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Sample calculations will need to be made to illustrate the typical expected costs and savings per suite before and after the implementation of individual suite metering, from a customer perspective.

Based on the draft regulations, our projections of the number of estimated individual suite meters were as shown in the table below. With the removal of the 2010 deadline from the final regulations, our revised projections have been added.

Additional Suite Meters	2007	2008	2009	2010
Original	5000	15000	15000	15000
Revised	1920	3700	8200	9700

7. Customer Communications

An essential part of the overall plan for to offer individual suite metering for condominiums is customer communications. In this case, the customers include developers, property managers, condominium boards, and individual suite owners.

Our Corporate Communications staff have been engaged to develop a detailed communications plan, and to assist in its execution. The plan will include initial contact and promotion, working with our third party service provider, contacting condominium associations and property management companies. In addition to promoting Toronto Hydro as a desirable metering service provider, the communications will need to ensure clear understanding of expectations and obligations by all parties.

In general, many of the condominium corporations in Toronto are expected to prefer to have Toronto Hydro provide individual suite metering and billing services. Our corporate stability, city ownership and publicly regulated services make us attractive, if we can offer competitive services and costs.

8. Pilot Trial Installations

Toronto Hydro has committed to installing meters at six new condominium development sites, involving approximately 2300 individually metered suites. All of these installations are using the Quadlogic power line carrier metering system.

Since we cannot justify buying and supporting the meter reading software for these pilot installations, our interim solution is to hire a third party service provider to collect and store the data, and provide it to the Banner CIS as required for billing.

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These pilot installations will give Toronto Hydro a valuable opportunity to test our internal business processes for the creation of large numbers of new customer accounts within tight time limits.

9. Next Steps

It is clear that Toronto Hydro will need the assistance of a third party metering services provider to meet the immediate demand from condominium corporations. We will need to partner with one or more third party companies to install meters and solicit existing condominiums for installations.

A RFP was sent out to prospective third party meter service providers and responses have been received recently. The evaluation requires diligent analysis before a recommendation for selection is made and contract agreement developed. The selection of metering technology is also inherent in the RFP evaluation.

10. Conclusions and Recommendations

The introduction of Regulation 442/07 of the Electricity Act was done to improve electricity conservation in Ontario. Toronto Hydro has both an opportunity and an obligation to participate in the implementation of individual suite metering in condominium buildings.

The technologies to provide individual suite metering are evolving, but there are currently available options to make individual suite metering successful.

With regulatory approval, Toronto Hydro can offer individual suite metering to both existing and new condominium boards within our city.

We recommend that we proceed with the evaluation, selection and contracting with a suitable business partner to begin offer these services.