HYDRO-QUEBEC DISTRIBUTION'S RESPONSE TO THE RÉGIE'S REQUEST FOR INFORMATION NUMBER 1

CONTEXT OF THE LAD PROJECT

1. References: (i) Case R-3708-2009, Item B-1, HQD-3, document 2, page 7;
(ii) B-0006, HQD-1, document 1, page 7;
(iii) B-0006, HQD-1, document 1, page 30;
(iv) B-0006, HQD-1, document 1, page 13;
(v) B-0006, HQD-1, document 1, pages 14 and 15.

Preamble:

(i)

Table 2
2008 Useful Lifespan Revision

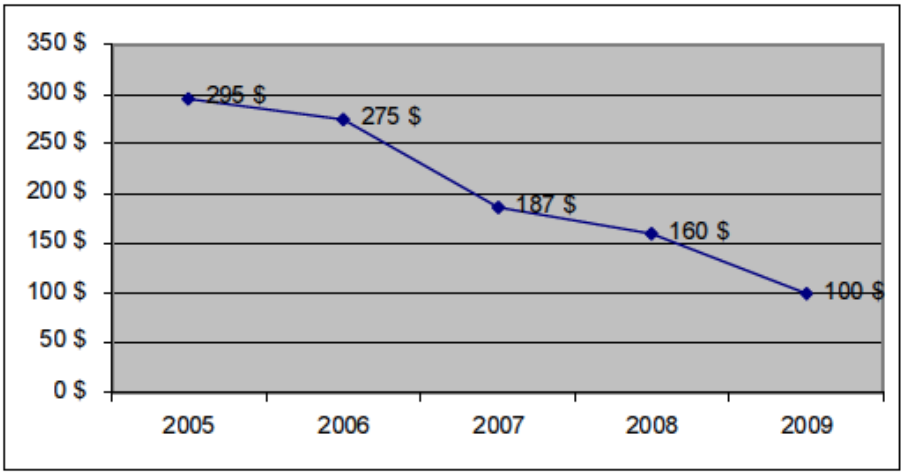
Categories of Tangible Fixed Assets	Initial Lifespan	Revised Lifespan
Meters, power indicators	25 years	10 years
Electronic meters	10 years	9 years
Test terminals and jacks	30 years	25 years
Mercury probe controller	25 years	20 years
Drainage	50 years	40 years
Transport equipment	5 years 7 months	6 years

(ii) The Distributor states that, "the new generation meters will be deployed in three stages (regions) over a five-year period, constituting the LAD project's meter replacement plan" and that 3.75 million meters will be replaced between 2012 and 2017.

(iii) "To sustain a high installation rate without jeopardizing its current operations, the Distributor will call on of the services of an outside installer whose role will be to install a significant portion of the new generation meters, mainly those that will need to be installed for residential clients. Thus, more than 90% of the residential client meters in regions 1 and 2 will be installed by employees of this outside firm. The others will be installed by the Distributor's installers."

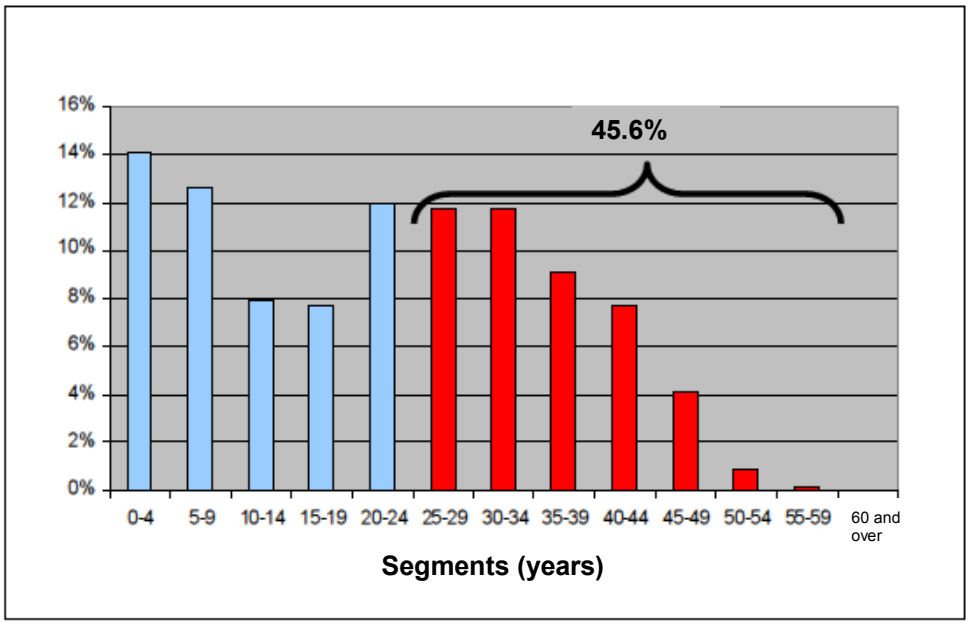
(iv)

Figure 2: Progression of New Generation Meter Prices, 2005-2009



(v) "Figure 3 shows the age distribution of the current fleet of meters. It shows that more than 45% of the meters exceed their lifespan, set at 25 years for electromechanical meters and 15 years for electronic meters serving residential clients." (emphasis added)

Figure 3: Age Distribution of the Meters (2011)



Questions:

1.1 Please reconcile the 15 year lifespan mentioned in reference (v) for the Distributor's fleet of electronic meters with the accounting life of the electronic meters that goes from 10 to 9 in reference (i).

Answer:

The electronic meters mentioned in reference (i) target only the CII client base. This generation of meters precedes the meters that will be deployed in the LAD project. It therefore involves meters with a different technology. The revision of their lifespan to nine years does not affect electronic meters serving residential clients because it involves a different type of electronic meter. The lifespan of current electronic meters for residential clients is 15 years.

1.2 Please justify the selection of a 15 year lifespan for LAD project meters.

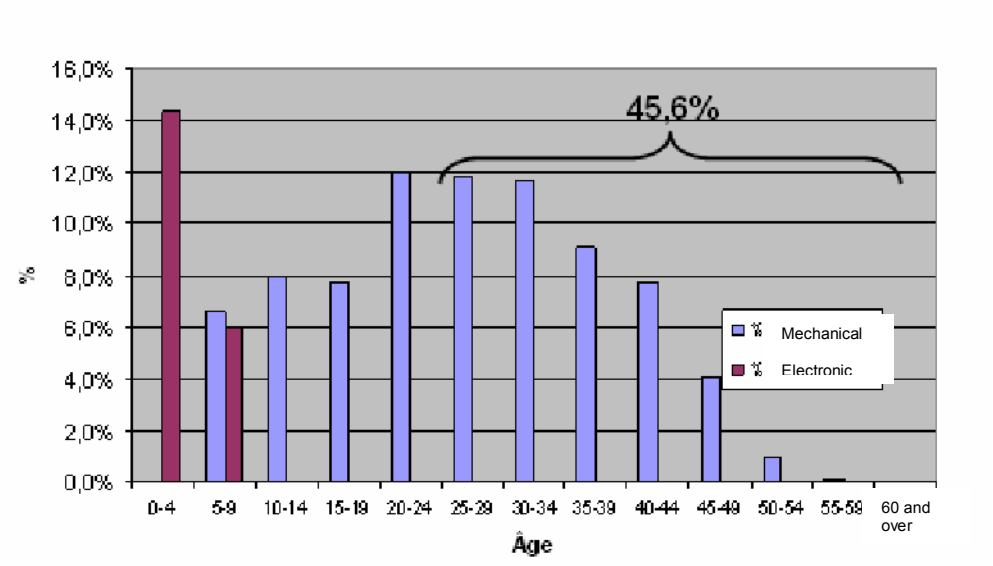
Answer:

The Accenture firm conducted a benchmark of the accounting lifespan selected by distributors who have undertaken AMI projects. The benchmark, filed as Attachment A, indicates that regulatory bodies have generally accepted a 15 year accounting lifespan. Additionally, in the request for proposals, the Distributor asked the bidders to provide a useful lifespan for their equipment. The supplier, selected by the Distributor at the end of the second request for proposals targeting the acquisition of meters, indicated that the new generation meters for residential and CII clients have a technical lifespan of 20 years or more. An accounting lifespan of 15 years therefore constitutes a prudent estimate in line with the industry.

1.3 Please add more detail to the histogram from Figure 3 in order to show the proportion of electronic meters in the fleet and the distribution by age segment of the electromechanical meters and also, separately, the electronic meters.

Answer:

Table R-1.3: Distribution of the fleet of meters by type and age segment



From Figure 3, the Régie understands that while complying with Measurement Canada requirements, the Distributor's management of its fleet of meters has made it possible to have a fairly uniform distribution of the age of the fleet and also benefit from an effective lifespan of the meters that exceeds their accounting lifespan.

1.4 Please explain how the fact that 45% of the meters have an age over 25 years justifies the replacement of the entire fleet of meters within a period of five years for protecting the durability of the embedded base.

Answer:

The replacement of the fleet allows structuring the meters in a network that requires a concentration of equipment in a given geographic area so that they can be meshed together. If the required concentration of equipment is not met, the new generation meters cannot be read remotely. Accelerated deployment done by geographic zone is also an essential condition in order for the Distributor to be able to quickly make the efficiency improvements. The Distributor therefore cannot replace the current meters by new generation meters according to their age, because the savings related to remote automated reading would then be delayed over time.

The rapid replacement of meters is similar to how other distributors installed their AMI networks. Thus British Columbia, Ontario, Florida, California and Italy recommended fast replacement rates in order to renew the fleet quickly just as the Distributor is proposing.

Starting from the fact that the movement to AMI technology will eventually be unavoidable and that it will be possible to do it at the price of a massive and accelerated deployment, the Distributor considers the fact that more than 45% of its fleet of meters has exceeded its lifespan to be an opportunity because it therefore minimizes the impact of the write-off.

Furthermore, the Distributor clarifies that by replacing the entire fleet within a period of five years it can benefit from considerable and recurring gains that go well beyond the costs generated by the replacement of meters whose lifespan has not expired.

Continuing the measurement activities as is performed today is in no way a conceivable solution considering the use of a worn-out fleet poses several disadvantages and risks:

- **Increased risk of failure of the meters**
- **Increase of corrective type work to the detriment of preventive type work**
- **Potential difficulty for equipment related supplies and obtaining services for technologies that are no longer supported**
- **Development of expertise that lags behind new technologies used in the marketplace and maintaining expertise on outdated technologies in the context of many people retiring**

A massive deployment starting in 2012 will also provide several advantages related to maintaining the embedded base:

- **The Distributor minimizes the disadvantages related to operating two parallel processes for too long**
- **The new Measurement Canada sampling standard S-S-06 that currently only applies to electronic meters will be extended to electromechanical meters in January 2014. The introduction of the new standard will increase the number of meter replacements because the number of lots of sampled electromechanical meters will be increased. By replacing its fleet of meters, the Distributor therefore avoids the costs related to withdrawing batches of meters, because the meters from one given batch are distributed throughout its grid and not concentrated into geographical zones**
- **A significant reduction in the number of models of meters in the fleet and their accounting will have favourable short-term impacts on the**

maintenance work on the fleet of meters

- **New functions available in the AMI (remote testing and receiving alerts in case of events) and the development of new expertise will support the distributor in the maintenance work for its fleet of meters and will contribute to its efficiency**

The Distributor exercises a healthy management of its fleet of meters through a proactive approach aiming to maintain a high level of reliability. The LAD project will make it possible at the end of the five-year period to have a fleet with better durability at a lower cost.

1.5 Please expand upon the advantages and disadvantages of introducing a base of 3.75 million meters within an interval of only five years in consideration of the future maintenance and replacement needs of these meters.

Answer:

The Distributor is planning to spread out the replacement of the new generation meters over several years in order to reduce the inevitable impact from a massive replacement at the end of their useful lifespan. To do that, the Distributor will work from its understanding of managing a base of meters and on the experience it already has and that coming from managing a base of new generation meters.

The sum of $250 million in current dollars is planned in the same economic analysis for the replacement of meters starting in 2027.

Furthermore, this technology 0ffers the Distributor a more precise understanding of its embedded base that favourably contributes to renewal management. For example, the measurement operations center will be able to track the virtual meter lots in real-time.

Finally, the Distributor will most likely be able to get a dispensation from Measurement Canada for the sampling work required by regulation, and thus lighten its work load in this respect in connection with the replacement of the entire base of meters over a short period.

See the answer to question 1.4.

1.6 Considering the past and expected progression of the cost of the technology involved, and the impact of the installation rate on the investments and the current operations of the distributor, please indicate whether the Distributor has considered deploying the LAD technology over longer period such as 10 or 15 years instead of the five years proposed. If not, please explain why.

Answer:

The Distributor has not considered deploying the AMI over a period longer than five years. In addition to the impacts on the maintenance activities for the current fleet, an extension of the deployment leads to a delay in the realization of the efficiency savings and in the implementation of possible additional functions.

While negotiating contracts with the suppliers selected following the second request for proposals, the Distributor negotiated the possibility, should it happen that another contract be concluded at a lower price elsewhere in the world, of acquiring the meters at a cost equivalent to it. The Distributor is therefore assured it will benefit from a potential price drop.

The impact of the deployment on the Distributor's operations are minimized by restricting the scope of the project to the installation of meters, establishing remote meter reading and the automated service interruption and restoration function.

The impacts of the project on the investments are compensated by the efficiency savings that will occur more quickly.

Several factors in the context favour the choice of a massive deployment starting in 2012:

- **The aging fleet of meters makes the replacement of all the meters and the adoption of the AMI technology advantageous**
- **The maturity of a technology from that one draws the maximum in conjunction with a massive deployment by geographic zone**

- **The falling prices of new technologies**
- **The window of opportunity created by many retirements from the company during 2012-2017**

The distributor does not believe that in the medium term it could again benefit from the convergence of all these favourable factors.

2. References: (i) B-0006, HQD-1, document 1, page 58
(ii) B-0006, HQD-1, document 1, page 17

Preamble:

(i) Table B-4 shows the project's asset depreciation lifespan. The technological components of the project have lifespans of five years for the MDMS and acquisition front-end, and 15 years for the meters, collectors and routers.

The asset depreciation method is linear based on the lifespans given in Table B-4.

TABLE B-4: ASSET DEPRECIATION LIFESPAN

ASSETS	DEPRECIATION LIFESPAN
Meter	15 years
Poles	40 years
MDMS	5 years
Acquisition Front-End	5 years
Collectors	15 years
Routers	15 years

(ii) "The Distributor will only implement the AMI IT to automate the meter reading process and the cut off and restoration of service. However, the Distributor may eventually wish to move towards a "Smart Grid" type intelligent network. Consequently, the Distributor requires that the technology from new generation meter suppliers enable establishing new functions."

Questions:

2.1 Please indicate the additional costs associated with the requirement that the new generation meters support setting up new "Smart Grid" type functions.

Answer:

The acquisition cost of the new generation meters routinely includes the items necessary so they can implement a "Smart Grid" type intelligent network without additional cost.

All the functions likely to be required for the deployment of a "Smart Grid" type network are present in the meters acquired by the Distributor. The Distributor will not need to perform any physical action on the new generation meters installed on client locations. The additional costs required for their activation will be mainly related to IT development. At the right time, the addition of these functions will be supported by an analysis of the needs, costs and benefits and presented to the Régie if required.

2.2 The Régie understands that the Distributor is considering setting up "Smart Grid" type functions before the meters expire. Please provide more detail on the Distributor's requirements for the MDMS and the acquisition front-end: could they allow for the implementation of these functions or must they wait for the new version in 5 years?

Answer:

The new "Smart Grid" type functions could be set up once the AMI grid is in place. The MDMS and the data acquisition front-end will make it possible to set up these new functions immediately.

TECHNOLOGY BEHIND THE LAD PROJECT

3. Reference: (i) B-0006, HQD-1, document 1, page 21;

Preamble:

"In addition to the radiofrequency mesh network connecting the meters, routers and collectors, the AMI requires the use of a WAN. The purpose of the WAN is to interconnect the data acquisition front end (located in the Distributor's IT centers) to the collectors. **Cellular or satellite type communication links are used."**

Question:

3.1 Please indicate which company will provide the cellular or satellite type telecommunication service required for the WAN function?

Answer:

Following the request for proposals, the telecommunication service will be provided by Rogers Communications Inc. as indicated on line 18, page 27 of item HQD-1, document 1. However, the Distributor wishes to point out that all the contracts concluded in connection with the LAD project are conditional on project authorization by the Régie.

3.2 Please indicate the amounts associated with this service and whether these costs are currently incorporated in the project's costs. If not, please indicate why.

Answer:

The amounts associated with the telecommunications services are included in the project charges under the heading "Telecommunications" from Table 4 of item HQD-1, document 1. The amounts associated with this service are filed under confidential envelope.

PROJECT LAD DEPLOYMENT

4. References: (i) Item B-0006, page 7;
(ii) Item B-0006, page 15;
(iii) Item B-0006, page 30.

Preamble:

(i) Table 1: Principal Steps of the LAD Project

(ii) Figure 3: Distribution of the Meters by Age (2011)

(iii) Table 3: Deployment of the LAD Project Meters by Region

Questions:

4.1 Please specify the average age of the meters for the regions of Quebec and municipalities mentioned in reference (iii).

Answer:

Table R-4.1: Average Age of the Meters by Phase and Region (Years)

Phase	Region	Average Age
Phase 1	Montreal	23.7
	Laval	20.9
	North shore	19.9
	South shore (57%)	20.2
Phase 2	South shore (43%)	20.8
	National capital	21.1
	Chaudière appalaches	22.7
	Outaouais (partial)	20.6
	Mauricie/centre (partial)	22.3
	Saguenay (partial)	22.7
	Bas St-Laurent (partial)	23.5
Phase 3	Other regions of Quebec	22.2

4.2 Considering the average age of the meters by region of Quebec and municipalities mentioned in reference (iii), please justify the meter deployment strategy currently planned by the Distributor.

Answer:

The average age of the meters is relatively uniform throughout all the regions of Quebec and does not justify starting with a given region solely for the durability of the fleet. The Distributor therefore chose to start setting up an AMI network in the Montreal region considering how near it is to technical experts, because this region includes all the scenarios that will be encountered during deployment and because a deployment in a high density zone generates more savings. The Distributor could then quickly acquire knowledge necessary to adjust its strategy for the subsequent Phases according to the situations encountered.

See the answers to questions 1.4, 1.5 and 1.6.

5. References: (i) Item B-0006, page 11;
(ii) Item B-0006, page 24 to 26;
(iii) Item B-0006, page 43.

Preamble:

(i) "The region 1 meter replacement plan covers:

- purchase of new generation meters and telecommunications equipment (collectors and routers)
- replacement of 1.7 million meters between June 2012 to December 2013 with new generation meters, and also installation of collectors and routers associated with these meters
- use of an AMI and performance of the new meter reading process."

(ii) Section 4.2.1: Pilot Projects

(iii) Table 9: Risk Analysis and Mitigation Measures

Questions:

5.1 Please justify the filing of this authorization request for the LAD project dated June 2011, considering the pilot projects will not all be completed before May 2012 and all of the final analyses concerning the feasibility, reliability and profitability test results for the AMI solution are not currently known.

Answer:

The preparatory work that has been done up to now has allowed us to confirm the Distributor's main assumptions, set prices contractually and confirm that the technology is adequate and functional. By doing that, the Distributor has acquired a level of understanding and detail that would not justify delaying the project. Also, the new generation meters are approved by Measurement Canada, the telecommunication equipment is functional, data can be acquired with the acquisition front-end and the data transferred to the MDMS are whole and complete. The main costs of the LAD project have already been determined. The Distributor therefore believes that it has reduced the risk well below those typically observed in this type of project. The knowledge level acquired at the time of filing the LAD project exceeds that of other investment projects filed with the Régie for authorization. This level of knowledge was however necessary considering the LAD project size.

5.2 Please present, in their in their current content, the results of the pilot projects and the associated analyses justifying the new generation meter deployment starting June 2000.

Answer:

At the moment of filing, the Distributor already had data confirming the project's technical solution as listed in part H QD-1, document 1, pages 24 and following. Thus, the Distributor had:

- **collected consumption profiles**
- **tested the security of the solution**
- **confirmed the installation procedures**
- **tested communication between the various components of the AMI network**
- **verified the data integrity**

In more detail, the pilot project for the implementation of the MDMS, residential meters for the Heure Juste rate project and also remote measurement meters for the CII clients allowed successful demonstration of:

- **the integrity of the consumption data coming from the MDMS for billing purposes and its correspondence to the current meter reading process**
- **the stability and performance of a virtualized IT infrastructure**

The proof of concept confirms the proper operation of the key elements of the solution (acquisition front-end, telecommunication network, meters) in an environment similar to the Distributor's. This proof of concept has been confirmed by specialists from the Distributor and a security specialist from an outside firm.

Since filing its request with the Régie, the Distributor has undertaken pilot projects in order to test the solution in an industrial zone (Boucherville), in an isolated rural zone (Memphrémagog region) and in an urban zone where the meters are located inside buildings (Villeray neighbourhood of Montreal). The purpose of these pilot projects is so the Distributor can test its installation assumptions, including installation assigned to an outside installer, and test the volume supported by the solution, its coverage and the reading rates. To date, the pilot projects confirm that the solution is functional and that the assumptions about the installation are realistic.

The conclusion still to come aims to improve the deployment scenarios. Additionally, the pilot projects are continuing in order to test the meter installation assumptions in wintertime. The conclusions that will be obtained at the end of the pilot projects will be applied to the bulk deployment of meters starting June 2012.

PROJECT COSTS AND ECONOMIC ANALYSIS

6. References: (i) Item B-0006, page 7
(ii) Item B-0006, page 8
(iii) Item B-0006, page 17
(iv) Item B-0006, page 37
(v) Pièce B-0006, pages 39 and 40
(vi) Item B-0006, page 40
(vii) Item B-0006, page 41
(viii) Item B-0007

Preamble:

(i) "the achievement of the efficiency improvements coming from the automation of consumption reading, and the remote cut off and restoration."

(ii) "The LAD project will be able to generate savings of nearly $300 million (actualized to 2011) over 20 years. From 2018, the recurring annual savings will be $81 million. Because of the accumulated savings, the fixed infrastructure costs will be paid back after completion of the first region of the meter replacement plan. In fact, over the 20 year analysis period, a savings of $73.70 is generated for each meter installed. This savings will make it possible to offset the costs of setting up the AMI IT after 1.2 million meters have been installed.

(iii) "'Thus, fewer than 300 employees will need to be relocated within the distribution division or elsewhere in the company."

(iv) Table 6: Savings Associated with the LAD Project

(v) Table 7: Results of the Economic Analysis the LAD Project (in Millions of Dollars Actualized to 2011)

(vi) "A good representation of the economic value of the LAD project is to express the fiscal room opened by this project in dollars per meter. This unit savings of $73.70 (annuity increasing at the inflation rate) can compensate the cost of setting up the AMI IT once 1.2 million meters are installed."

(vii) "Considering that the savings from the LAD project are principally attributable to the reduction of positions…" ».

(viii) Excel file: Analysis of the AMI Scenario

Questions:

6.1 Please confirm that the savings of nearly $300 million over 20 years mentioned in reference (ii) correspond to the difference of the actual costs between the AMI scenario and the reference scenario.

Answer:

The Distributor confirms that the savings of nearly $300 million (actualized to 2011) correspond to the difference between the AMI scenario and the reference scenario over 20 years. These savings however exclude the initial investment of $88 million (actualized) for setting up the IT infrastructure.

6.2 Please indicate whether all the savings associated with the LAD project, presented in reference (iv), will cover the initial cost for purchase and installation of the new generation meters over a 15 year period, corresponding to their depreciation time. Please use a table to supplement the response

Answer:

Table R-6.2 shows in parallel the savings from the LAD project from table 6 (reference iv) with the initial cost for purchase and installation of new generation meters that appears in Table 4 from item HQD-1, document 1 (page 34). The savings and costs have been actualized over 2012-2027, that is 15 years – corresponding to the depreciated lifespan of meters.

The LAD project, by including the initial costs, therefore generates net savings of $172 million.

It should be noted that in Table R-6.2, the savings are evaluated by comparing scenarios (AMI scenario – reference scenario) whereas the cost of purchasing and installing the meters corresponds to the cost of the AMI scenario alone.

Table R-6.2: all of the savings and costs of purchasing and installation of meters (actualized to 2011) over 15 years

M$ (actualized to 2011) analysis period: 2011-2027	AMI Scenario
Investments	483.8
Savings	(623.0)
Tax on public services	-
Residual values	(33.1)
Total	**(172.3)**

6.3 Using a table, please demonstrate after how many years the savings associated with the LAD project will allow it to have a null impact or lower the required revenue (including depreciation and write-off charges).

Answer:

The savings reflected in Table 6 from item HQD-1, document 1 (reference iv) serve to clarify the savings from the salary base and other operating charges generated by the installation of new generation meters. These savings are also considered in Table 8 from item HQD-1, document 1 on page 42 by the difference between required revenues from the reference scenario and the AMI scenario. As shown in Table R-6.3, the savings have a favourable impact on the required revenue starting in 2018.

Table R-6.3: Financial Analysis and Impacts of the LAD Project on the Required Revenues (k$ current)

	k$ (current)												
	AMI Scenario	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2025	2031
	Charges	73,895	77,137	70,176	55,213	35,975	26,855	15,922	13,127	9931	10,002	10,586	11,905
	Depreciation	4,626	20,456	35,564	47,459	55,184	57,183	55,266	54,909	53,998	52,613	52,491	22,477
	Tax on public services	0	16	77	136	182	196	191	186	181	175	154	123
	Financing costs	2,473	13,820	25,967	34,241	37,827	38,045	36,533	33,596	30,311	27,097	14,881	13,876
A	Required revenue (excluding write-off charges)	**80,994**	**111,429**	**131,784**	**137,049**	**129,168**	**122,279**	**107,912**	**101,818**	**94,421**	**89,887**	**78,112**	**48,381**
B	Required revenue – Reference scenario	**65,974**	**76,797**	**87,145**	**95,856**	**104,455**	**111,485**	**115,880**	**119,609**	**123,479**	**127,292**	**143,307**	**149,238**
C=A-B	Required revenue (difference of scenarios)	**15,020**	**34,632**	**44,639**	**41,193**	**24,713**	**10,794**	**-7,968**	**-17,791**	**-29,058**	**-37,405**	**-65,195**	**-100,857**
D	Depreciation and Write-Off of In-Service Devices	**36,800**	**61,179**	**41,039**	**16,232**	**3,785**	**1,093**	**0**	**0**	**0**	**0**	**0**	**0**
E=C+D	Required Revenue (differential)	**51,820**	**95,811**	**85,678**	**57,425**	**28,498**	**11,887**	**-7,968**	**-17,791**	**-29,058**	**-37,405**	**-65,195**	**-100,857**

6.4 Please indicate whether the Distributor has comparative data concerning the unit savings per meter reported or expected by other North American companies having implemented or implementing AMR-AMI type infrastructures. If yes, please file these data. If no, please obtain them and produced them.

Answer:

The data concerning the gross savings per meter are filed in Attachment B. Thus, for the remote meter reading function, the gross savings will be larger for a distributor who gives up manual meter reading for setting up an AMI than for a distributor who has already set up AMR technology. In the case of the remote connection/disconnection function, the gross savings for the Distributor comes solely from its use in connection with the collection process.

6.5 Please indicate the reasons why the Distributor excludes the costs relating to the IT infrastructure when it compares the AMI scenario to the reference scenario.

Answer:

The IT infrastructure constitutes a prerequisite to the deployment and installation of new generation meters. These costs for setting up the AMI have not been excluded in the sense that they are not considered, instead they are presented separately because they constitute unavoidable costs once the Distributor has chosen to go with this new meter technology. Furthermore, by presenting these costs separately it can be seen at what time they are recovered by the project's unit savings.

6.6 Please clarify how many positions will be affected at the end of the LAD project for each of the following activities:

- Automation of reading consumption
- Collection
- Interruption and restoration of service

Answer:

Table R-6.6: Number positions affected by activity

Activity	Number of positions
Automation of reading consumption	**624**
Collection • **Interruption and restoration of service**	**102**

The service interruption and restoration activities targeted by the project are a component of the collection process and are consequently handled under one heading. The automation of reading is a distinct activity that also combines 21 positions affected by the reduction of calls in the Distributor's call center.

See also page 31 of the item HQD-1, document 1.

6.7 Please indicate how the efficiency savings presented in the case, and principally associated with a reduction of positions connected with the activities touched by the LAD project, could bring net savings for the Distributor overall whereas several employees will be relocated within it.

Answer:

Retirements in the company as a whole will leave some positions vacant that will need to be filled. The employees whose positions will have been abolished in connection with the LAD project and who must be relocated can fill these positions thereby avoiding the need to hire outside resources. There is therefore a net reduction in the number of employees.

6.8 Please clarify the monitoring plan that the Distributor intends to set up concerning the realization of the expected savings. Please indicate what the Distributor intends to do should the expected gains not be realized.

Answer:

The Distributor's monitoring plan was prepared in order that a tracking process can be conducted when manual meter reading activities are retired. Once a new generation of meters is installed in a given territory, the positions related to meter reading will be abolished in the area and

accounted for. When eliminating the meter reading activity, each manager will go ahead with the removal of equipment resources (including equipment, workspaces, cellular telephones, etc.) that are specific to it and the withdrawals will also be accounted for.

The project office is responsible for ensuring that the benefits become definite and that all the efforts required are deployed. It will have all the information required so that you can observe that all the expected benefits are achieved and that this happens at the same rate as the deployment of the AMI, and it will issue tracking reports so that this can be observed. These reports will be used as input to the tracking procedure filed with the Régie in connection with the Distributor's annual report.

Additionally, because the LAD project is imminent, the acquisition of some assets (rolling stock for example) by the Distributor is restricted or delayed because material resources used in connection with the meter reading activity could be reused to meet the needs of other activities.

6.9 Please elaborate on the qualitative and quantitative savings coming from the LAD project in its current form that will benefit the Distributor's clients.

Answer:

The following are the expected savings:

- **Actual reading of the consumption both for regular billing and during a move: Currently, several bills are issued based on consumption estimates. When a client moves, they must advise the Distributor and provide them their consumption data. The Distributor will henceforth be able to obtain exact consumption data remotely on the effective date of the move. The client will no longer be required to fill in a card with their own reading of the meter**

- **Making consumption periods uniform: The Distributor's current practices mean that the meter reading data is obtained up to four days before and eight days after the planned meter reading date. Clients therefore have readings varying from 54 to 66 days. The MDMS will be able to provide exact data for a uniform time for each consumption period**

- **Reducing the disadvantages related to access to the clients' property: Currently meter reading requires six**

annual visits in the case of residential clients. 35% of the meters are located inside buildings, imposing disadvantages on the clients because the meter reader must enter their residence. In other cases, even though the meter is located outside, the meter reader must still have access the client's property. Visits will no longer be required with the new generation meters

- **In terms of quantitative improvements, the elimination of manual meter reading will lead to a lowering of the required revenues starting in 2008 as illustrated in response to question 6.3**

There could be more advantages for the clients should the new functions shown in Figure 4 from item HQD-1 document 1 be established.

7. References: (i) Item B-0006, page 9;
(ii) Item B-0006, page 43.

Preamble:

(i) "The Distributor has chosen to present the LAD project in three Phases. A specific request for authorization under Article 73 of the *Loi sur la Régie de l'énergie* [Law for the Energy Authority] that will be made for each of the Phases. The selection of the Phases is justified by the size and length of the LAD project. Authorization of distinct Phases by the Régie will make it possible for the Distributor to incorporate possible refinements to the costs and a re-evaluation of contingencies during the LAD project, based on the experience acquired and the potential evolution of the technology. This regulatory approach by Phase, centered on risk management, respects the recommended deployment approach."

(ii) Table 9: Risk Analysis and Mitigation Measures

Questions:

7.1 Considering the current knowledge and expected results, please clarify what the Distributor means when it states possible evolution of the technology, refinement of the costs and a re-evaluation of the contingencies.

Answer:

The Distributor's experience with the implementation of Phase 1 of the LAD project will make it possible to re-evaluate and refine the assumptions for the costs not fixed by contract and to go ahead with the necessary adaptations

of the technology should that be necessary. The solution considered could then be adapted to the knowledge acquired by the Distributor, and the contingencies re-evaluated as a function of this knowledge. Further, the development of more economical technical solutions, in particular relating to telecommunications, could allow the Distributor to propose a different but still compatible solution for setting up the AMI network in rural or isolated regions.

7.2 Considering the possible refinement of the costs and a re-evaluation of the contingencies during the execution of the LAD project, please justify the mitigation measures called for in reference (ii).

Answer:

The contingencies provided for by the Distributor only involve the items from the LAD project that are not under contract. The mitigation measures principally aim to assure reduction of the risks linked in particular to the operational aspects of the deployment such as the installation rate and pace and the deployment strategy.

These mitigation measures are therefore necessary beyond the contingencies and the refinement of the costs.

7.3 Please present the items (investments, charges, etc.) related to Phase I that could become unnecessary in the case where the following Phases were not done for one reason or another.

Answer:

All of the items related to Phase 1 remain useful in the case where the following Phases were not conducted. The costs specific to subsequent Phases will be incurred at the time of their execution.

7.4 Please indicate whether the Régie's authorization of Phase I makes the authorization of subsequent Phases necessary or inevitable, considering that the costs, savings, depreciation and economic analysis presented during the present case concerned the LAD project in its entirety.

Answer:

The LAD project is a structural project of the Distributor aiming to replace all the meters by new generation

meters. In order to fully evaluate the efficiency savings from this project, the Distributor performed economic and financial analyses of the entire LAD project. However, the Distributor specifically presents the costs from Phase 1 that were the subject of a request in section 10.2 of item HQD-1, document 1.

The Distributor selected a regulatory approach in line with the recommended deployment approach by predicted phases in order to manage risks related to the deployment of a project of this scope and length. The Distributor thinks that it is important that the Régie be informed of the progress of the deployment of its project, which justifies the regulatory approach by phases recommended by the Distributor.

8. References: (i) Item B-0006, page 34;
(ii) Item B-0006, page 45.

Preamble:

(i) Table 4: LAD Project Costs (2010-2017)

(ii) Table 10: Number of Meters Replaced in Region 1

Questions:

8.1 Please supplement the table from reference (i) by indicating for each of the years, the expected number of meters that will be placed in service (and not just installed) and also the corresponding cost to be included in the base rate.

Answer:

Table R-8.1 shows in detail both the number of meters put in service for each of the years and also the amounts included in the base rate (costs for acquisition and installation of meters) and their fair share of the related costs. Meters are placed in service at the time of their installation; their inclusion in the base rate therefore tracks their installation.

Table R-8.1:
Number of Meters Placed in Service and Added to the Base rate

k$, current	Preparatory work	2012	2013	2014	2015	2016	2017	Total
Number of meters placed in service	*27,176*	*330,391*	*1,339,931*	*1,097,369*	*647,488*	*207,233*	*202,818*	*3,852,406*
Costs included in the base rate	*$6,364*	*$56,621*	*$203,337*	*$165,437*	*$106,404*	*$49,412*	*$48,784*	*$636,358*

8.2 In the table from reference (ii), please indicate the number of meters replaced by quarter that correspond to the inclusions in the base rate.

Please show by month for 2012 and 2013 the number of meters put into service to be included in the base rate and also the corresponding amounts.

Answer:

The distributor does not have a monthly plan, but a quarterly plan that is given in the contractual clauses that were concluded with the installer and the suppliers of new generation meters. To respond to the Régie's request, the Distributor has divided the quarterly planning data by three to get monthly data. The number of meters placed in service per quarter corresponds to the inclusions in the base rate plan at the end of each quarter.

Table R-8.2:
Number of Meters Placed in Service and Added to the Base rate

			Number of meters per quarter	Number of meters per month	Costs (K $)
2012	Q3	July	68,126	22,709	$3,892
		August		22,709	$3,892
		September		22,709	$3,892
	Q4	October	262,265	87,422	$14,982
		November		87,422	$14,982
		December		87,422	$14,982
2013	Q1	January	334,180	111,393	$16,904
		February		111,393	$16,904
		March		111,393	$16,904
	Q2	April	337,078	112,359	$17,051
		May		112,359	$17,051
		June		112,359	$17,051
	Q3	July	333,739	111,246	$16,882
		August		111,246	$16,882
		September		111,246	$16,882
	Q4	October	334,935	111,645	$16,942
		November		111,645	$16,942
		December		111,645	$16,942

9. References: (i) Item B-0006, page 34
(ii) Item B-0006, page 35
(iii) Item B-0007, page 36

Preamble:

(i) Table 4: LAD Project Costs (2010-2017)

(ii) "The purchase and installation rate of $584 million for new generation meters follows that of the planned deployment. The purchase price of the meters comes from the second request for proposals. The cost of installation performed by the outside installer was estimated by the Distributor because the results of the third request for proposals will only be known in August 2011. The cost of installation performed by the Distributor's personnel follows the service costs."

(iii) "Since the price of the meters comes from a request for proposals and firm prices, no contingency has been provided in this respect. However, the Distributor has integrated a contingency on the LAD project cost components that could vary. Thus, a $21 million contingency has been provided for the investments on the basis of a 15% rate applied to IT and telecommunications investments, and 12% on the installation costs of meters installed internally and on other investments. Similarly, an $8 million contingency on

operating costs, calculated on the basis of the 12% rate applied to the operating expenses, is planned."

Questions:

9.1 Please indicate how and on what basis the Distributor estimated the installation cost of the meters.

Answer:

The Distributor estimated the installation cost of the meters based on its experience and benchmark data provided by Accenture. The offers received at the end of the request for proposals that make it possible to choose the external installer confirms that the Distributor's assumptions are valid.

9.2 Please supplement the table from reference (i) by breaking out, for each of the years, the purchase cost of the meters and the installation costs separately.

Answer:

The Distributor is filing the requested breakdown based on the estimates used in the economic and financial analysis in a confidential envelope.

9.3 Please supplement the table from reference (i) by specifying, by year, the amount of the contingency planned for the investments and also the amount of the contingency planned for the operating charges.

Answer:

For the years 2011 to 2019, the contingency amounts are established as follows:

Table R-9.3: Annual Contingency Amounts
(K$, current)

PLANNED CONTINGENCY									
k$, current	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018+**	**Total**
INVESTMENTS	$0	$2,275	$4,307	$3,940	$4,521	$3,618	$2,613	$0	$21,274
CHARGES	$65	$532	$1,628	$1,879	$2,101	$658	$185	$1,032	$8,081

9.4 Please justify the application rates used for calculating the contingencies mentioned in reference (iii).

Answer:

The 15% contingency rate was established by the IT group on the basis of the risks evaluated for the IT work. This rate was established in consideration of the work already done, contracts concluded and also the experience of the IT group in this domain. This rate is used for similar projects.

The 12% rate was established on the basis of the risks estimated by the Distributor for each of its internal cost components. These rates were established taking into account their experience with meter installation.

9.5 Please indicate how the risks associated with a possible overrun of the LAD project costs beyond the planned contingencies, should that happen, will be allocated between the Distributor and its clients.

Answer:

The Distributor negotiated firm prices for the meters, routers and collectors and also for the MDMS and the acquisition front-end. It is currently negotiating the cost for their installation by outside resources. Doing that greatly reduces the risk for the client of a cost overrun attributable to the project because a major part of these costs are determined from the beginning.

Additionally, the Distributor has established a project management team that responsible, is in particular, for closely tracking both costs and intervals and various events that could occur. In particular this team will make sure that for each risk identified, a means of mitigation is prepared. Finally, the pilot projects make it possible for the distributor to limit in particular the risks of failure inherent in setting up new technology, and therefore cost overruns that would be associated with the unexpected (coverage not compliant with what was expected, additional integration work and others). The Distributor has therefore made every effort to minimize the risks attributable to the project.

Despite every effort and the application of the best project management practices, in the event cost overruns for the LAD project should occur beyond the contingency rates provided, the Distributor

will present the required explanations to the Régie and will request recovery of all the costs in its rates as allowed by the applicable regulatory framework. Similarly, should it happen that the project is done at a lower cost than expected, the client base will benefit from this cost reduction through lower required revenues and rates.

The Distributor needs to state again that in the case where the contingencies are not used, no cost will consequently be incurred. The Distributor therefore will not reflect these amounts in the base rate, which will be to the clients' benefit.

10. References: (i) Item B-0006, page 36
(ii) Item B-0006, page 36
(iii) Item B-0006, page 58
(iv) Case R-3708-2009, item HQD-3, document 2, page 7

Preamble:

(i) "The accounting value of the in-service devices is estimated at $160 million on December 31, 2011. Over the 2012 to 2017 period, the natural depreciation of the in-service devices according to their lifespan, without the LAD project, would be $109 million. With the LAD project, the replacement of the devices with new generation meters leads to a revision of the lifespan that causes an accelerated depreciation and write-off charges of order $51 million over the length of the LAD project."

(ii) Table 5: Depreciation and Write-Off of In-Service Devices

(iii) Table B-4: Assets' Depreciation Lifespan

(iv) Table 2: Revision of the Useful Lifespans – 2008

Questions:

10.1 Please explain the reasons why the new generation meters have a 15 year lifespan whereas the currently installed electronic meters have a nine year lifespan.

Answer:

See the answers to questions 1.1 and 1.2.

10.2 Please indicate whether the Distributor has comparative data concerning the new generation meter lifespans used by other North American companies having implemented or implementing AMR-AMI type infrastructures. If yes, please file these data. If no, please obtain them and produce them.

Answer:

See the response to question 1.2.

10.3 Please breakdown the table for reference (ii) totalling $160.1 million by indicating the annual and total amounts associated with each of the following headings:

- Depreciation of in-service devices
- Additional depreciation
- Write-off charges for in-service devices

Also please indicate the number of devices written off per year.

Answer:

As shown in Table R-10.3, the depreciation of the in-service devices without the LAD project would have been $109.3 million. The replacement of devices before the end of their lifespan leads to write-off charges of $85.7 million. The additional depreciation heading therefore results from two phenomena: a lowering of the depreciation considering that several assets would've already been written-off and an acceleration considering a revision of the depreciation period to six years for all the meters whose residual depreciation is over six years.

Table R-10.3: Depreciation, Write-Off and Number of Devices Written-off

M$

	2012	2013	2014	2015	2016	2017	TOTAL
Depreciation of In-Service Devices	19.5	18.9	18.5	18.3	17.4	16.7	109.3
Additional Depreciation	7.4	3.6	-5.3	-12.8	-13.6	-14.2	-34.9
Write-Off of In-Service Devices	9.9	38.7	27.8	10.7	0.0	-1.4	85.7
	36.8	61.2	41.0	16.2	3.8	1.1	160.1
Number of Devices Written-off	330,391	1,339,931	1,097,369	647,488	207,233	202,818	3,825,231

11. References: (i) Item B-0006, pages 38 and 39
(ii) Item B-0006, page 39
(iii) Part B-0006, page 41
(iv) Item B-0006, page 57

Preamble:

(i) "In order to measure the economic value of the LAD project, the Distributor compares the LAD project (AMI scenario) to the reference scenario.

Reference Scenario

Over the next 20 years, the Distributor continues its base activities (replacement and installation). In this regard, the entire fleet of meters will have to be replaced with standard electronic meters. […]

AMI Scenario

The base of 3.8 million meters is replaced in five years with new generation meters. Meter reading will move to remote reading mode progressively in accordance with the installation of the new meters. Then, at the end of each phase, it is possible to perform remote service cut off and restoration for clients in collection. […]"

(ii) Table 7: Results of the Economic Analysis the LAD Project (in Millions of Dollars Actualized to 2011)

(iii) "In order to test the robustness of its results, the Distributor conducted two exercises."

Increase the Reassignment Costs

A sensitivity analysis was performed using the hypothesis that the relocation of all the employees would be more difficult than planned and would cost the equivalent of two-years salary for everyone affected. […]

Increase the Investment Costs

This analysis seeks to evaluate variation of investment costs that would cancel out the cost reduction calculated between the reference scenario and the AMI scenario. […]"

(iv) Table B-1: Sizing of the Meters

Questions:

11.1 Please perform and present the following sensitivity analysis for the AMI scenario:

- Increase of all of the project implementation costs by 20%
- Increase of the replacement and deployment time by three years
- Increase of the replacement and deployment time by five years

Answer:

Table R-11.1 shows results of the economic analysis from increasing all the project implementation costs by 20%, except for the cost items involving the salary base. Salaries are governed by collective bargaining which does not provide for such an increase.

Table R-11.1: Results of the Economic Analysis with an Increase of 20% of the Implementation Costs
M$ (actualized to 2011)

M$ (actualized to 2011)
analysis period: 2011-2031

	AMI Scenario* increased 20%	Reference Scenario	Difference
Investments	862.8	500.4	**362.5**
Operating charges	414.4	871.8	**(457.4)**
Tax on public services	1.8	-	**1.8**
Residual values	(102.8)	(81.2)	**(21.6)**
Total	**1,176.3**	**1,291.0**	**(114.7)**

* excluding IT infrastructure

The cost reduction is therefore near $115 million (actualized to 2011). The initial investment for setting up the ITE (which also increased by 20%) is isolated in the results. This investment goes from $88 million actualized to $105 million actualized.

However, it is important to emphasize that the increasing the implementation costs by 20% is an unrealistic exercise because the majority of the costs are set by contracts with outside suppliers (see response to question 9.5).

Also, it seems more reasonable to evaluate the sensitivity of the project for cost variations which are truly variable and that could increase the portion of investments by 54% before reaching the breakeven point (as indicated in section 7.3 of item HQD-1, document 1). This breakeven point, or the moment when the savings are just sufficient to compensate the costs, is also reached when the Distributor simulates a simultaneous increase of 32% of the investments and operating charges that could vary, that again confirms the project's robustness.

Furthermore, the impact of the increase of the deployment interval over three years or five years cannot be evaluated by the Distributor. These two sensitivity analyses relate to situations completely different from those that served as the basis for the LAD project (replacement of the meters over five years). The prices submitted by various selected suppliers are dependent not only on the cost of the required equipment, but also the volume purchased, the rate of deployment of the meters and the length of deployment. Performing these two sensitivity analyses would therefore involve the revision of these assumptions and a determination of the impact on the prices, and this is a revision that the Distributor a priori cannot do.

See the answer to question 1.6.

11.2 Please indicate the annual number of meters replaced by the Distributor during each of the last five years.

Answer:

Table R-11.2:
Meter Replacement during the Last Five Years

Year	Number of Meters Replaced
2006	66,771
2007	63,405
2008	92,298
2009	94,289
2010	101,108

11.3 Considering the fact that more than 2,400 new generation meters will have to be installed on average per day to achieve the AMI[1] scenario, please indicate whether the budgets and human resources that are currently available to the Distributor and outside installer are adequate.

Answer:

Once the project is authorized, the Distributor will make sure that it has the resources required to handle a one-time increase of the workload available. It is also required that the outside installer maintain an average monthly rate of about 80,000 installations. The installer would therefore have to make sure that it has the required

[1] 3,825,231 meters / [(365-104) days/year * 6 years] = 2,443 meters/day. Saturday and Sunday excluded but holidays included.

resources in order to comply with the contract that binds it to the Distributor.

12. Reference: (i) B-0006, HQD-1, document 1, page 41;

Preamble:

The reference document shows the results of the sensitivity analysis, in particular following the increase of the costs of reassignment and investment.

Question:

12.1 Please file the sensitivity analysis in question from reference (i).

Answer:

The detailed results of the sensitivity analysis in that the reassignment and investment costs are increased are presented Attachment C.

USE OF THE LAD PROJECT FOR BILLING

13. References: (i) B-0006, HQD-1, document 1, page 16
(ii) B-0006, HQD-1, document 1, page 33

Preamble:

(i) "Residential clients or those whose power is below 50 kW are visited every two months for reasons of efficiency in line with the billing mode." »

(ii) "The daily readings will be done six times per day." »

Questions:

13.1 Since the LAD technology will make daily consumption readings possible, please clarify the Distributor's intentions concerning the possibility of offering monthly billing to its residential clientele.

Answer:

In order to assure an equitable treatment of its clients, the Distributor can only make modifications of this kind when the measurement infrastructure is in place for the entire client base. The data collected with the deployment of new generation meters will allow the Distributor to proceed with simulations and an analysis of the advantages, drawbacks and financial impacts of various scenarios including that of applying the 30 kWh per day associated with the first segment of rate D on a basis other than bimonthly. The results of these analyses will be presented at an opportune time in connection with a rate case. See also the answer to question 14.1.

13.2 Please evaluate the financial impacts for the Distributor of a monthly billing instead of every two months.

Answer:

See the response to question 13.1.

13.3 If appropriate, please present an update to the LAD project economic and financial analysis that incorporates these impacts.

Answer:

See the response to question 13.1.

13.4 Please elaborate on the advantages and disadvantages for the clients of monthly billing instead of billing every two months.

Answer:

Even though a full study is needed, the Distributor can a priori identify some advantages and disadvantages of monthly rather than bimonthly billing. It is important to note that this change to the billing cycle, like any other change to the rate structures and terms, must not produce revenues beyond the authorized required revenues.

From the perspective of some clients, monthly billing rather than bimonthly billing would make it possible to get a better price line on the basis of actual monthly consumption. Additionally, since the consumption period would be cut in half, it would result in a smaller

electricity bill, allowing better budget management for clients who are not on equal billing plans.

From the Distributor's perspective, monthly billing would make it easier to monitor collections, reduce the financial costs related to receiving payment and would make it possible for the Distributor to accelerate its actions with clients in payment default. In contrast, it would generate additional costs associated with cashing cheques, banking fees, stuffing envelopes and sending mail for clients who are not already on equal billing plans or who do not do electronic transactions.

14. References: (i) B-0006, HQD-1, document 1, page 16;
(ii) B-0006, HQD-1, document 1, page 25;
(iii) B-0006, HQD-1, document 1, pages 24 and 25.
(iv) Distributor's 2011 rates and conditions.

Preamble:

(i) "Only the meters for clients with consumption levels over 50 kW are read monthly by meter readers or the MV-90 system. Residential clients or those whose power is below 50 kW are visited every two months for reasons of efficiency in line with the billing mode."

(ii) "At the time of filing the case with the Régie, 100% of the meters installed in connection with the pilot project are detected at the acquisition front-end and are passed in advanced security mode. 100% of them are read daily by the acquisition front-end, …"
(emphasis added)

(iii) "The first pilot project has been ongoing since June 2010 and is continuing until May 2012. It aims to test the integration of the consumption data in the HYDRO-QUEBEC systems and the accuracy of the bills that would be obtained with the new technology. This pilot project is taking place in St-Jean-Richelieu, Val-d'Or, Sept-Îles and Trois-Rivières with 2600 meters from the Heure Juste [Right Time] rate project. Added to these meters are 800 additional meters for residential clients installed in order to allow a sufficient and representative density of new generation meters for an AMI network, and 17,500 meters already in remote measurement for the CII clients.
[…]
A third pilot project will extend from August 2011 to May 2012 and will concern the installation of meters by an outside service provider. It includes the installation of 19,000 meters in the Villeray neighbourhood of Montreal." (emphasis added)

(iv) The following definition appears on page 7 of reference (iv): "**consumption period**: a period during which electricity is delivered to the client and which is included between two dates considered by the Distributor for the calculation of the bill." *»*

The following clarification is found on page 9 concerning establishing the "**maximum power drawn**": "These power drawings are established for 15 min. integration periods by one or more measurement device models that were approved by the competent Régie. If required by the properties of the client's load, only the measurement devices required for billing are kept in service."

Page 14, Article 2.6 shows the structure of rate D, in particular the cost "**for the first 30 kWh per day**" and the cost per kilowatt of power to be invoiced monthly above 50 kW.

Because the residential clients' consumption is read once every two months, the Régie understands that the billing for the first 30 kWh per day is in practice applied to the first 1,800 kWh measured over a typical 60 day consumption period.

Questions:

14.1 For the client already equipped with LAD meters, please indicate how the Distributor calculates the number of kilowatt-hours to be invoiced at the 7.51 /kWh rate, in other words the number of kilowatt-hours beyond the "first 30 kWh per day" invoiced at 5.39 /kWh. (emphasis added)

Answer:

The parameters used for energy and power billing purposes remain the same whatever the type of meter installed at the client. No changes will be made billing.

14.2 Considering the reading sampling possibilities of the LAD meters, please indicate how the maximum power drawn is established for clients already equipped with LAD meters.

Answer:

See the response to question 14.1.

14.3 Please elaborate on the Distributor's intentions as to possible changes or modifications that will need to be made to certain elements of the Distributor's rates and conditions in order to reflect the new measurement technologies and their possible impact on the calculation of the energy and power bill. Please indicate in that forum the Distributor intends to take up this question.

Answer:

See the response to question 13.1.

ATTACHMENT A
RESPONSE TO QUESTION 1.2

LIFESPAN OF NEW GENERATION METERS

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AMI Business Case Research

Smart Meter life expectancy in North America

Context

While different types of meters have varying life expectancies, AMI meters have made significant technological advances compared to their AMR predecessors. *(For example, some older AMR meter used a battery to power the RF radio, this battery would run out after 7-9 years, this is no longer the case with newer AMI meters.)*

One way to judge whether a predicted asset lifespan is reasonable is to compare estimates with others in the market place. The following slides will present excerpt from AMI business cases from around North America.

AMI Business cases from North America

Utility	Asset life span/amortization used	PUC Filling/Business case Reference
BC Hydro	20 years	Published Business Case
Ontario Energy Board	15 years	OEB Accounting Procedures
SoCal Edison	15 years	PUC Filing
SDG&E	15 years	PUC Testimony
PP&L	15 years	PUC Testimony

Above are a few examples cited from business cases, regulatory filings and testimonies. In recent years Accenture has participated in no less then **17 AMI business cases that used 15 years as the smart meter asset life**.

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BC Hydro
Case highlights

SMART METERING & INFRASTRUCTURE PROGRAM BUSINESS CASE

BC hydro
FOR GENERATIONS

Amortization period	Amortization periods for smart metering assets acquired are based on the estimated economic life of each asset type, as follows: • Smart Meters: 20 years • Telecommunications (Field Area Network): 20 years • Telecommunications (Wide Area Network): 35 years • Distribution System Meters: 15 years • IT Hardware: 5 years • IT Software: 10 years	These amortization periods have no impact on the NPV of the business case. Assumed amortization periods do, however, affect customer rate impacts attributable to the Smart Metering Program.

Ontario Energy Board Accounting Guidelines

Ontario Energy Board
Accounting Procedures Handbook
Frequently Asked Questions
December 2010

ACCOUNTING PROCEDURES HANDBOOK

Frequently Asked Questions

Q.13 What is the estimated useful life of smart meters that distributors should use to calculate depreciation expense?

A.13 The useful life of smart meters used for regulatory purposes in the rate setting process is 15 years. For regulatory accounting purposes, 15 years useful life on a straight-line basis is used to calculate and record depreciation of in-service smart meters recorded in Account 1555, and for the smart meters recorded in Account 1860, Meters, which were transferred from Account 1555 on disposition of the account balance. This applies until such time as the distributor presents an independent depreciation study and the Board accepts a different useful life as more appropriate.

More then 60 distributors in Ontario must follow this guideline as they all have the same charter of accounts - standard requirements of the OEB.

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(U 338-E)

Advanced Metering Infrastructure Business Case Preliminary Analysis

Volume 1 – Vision Statement, Summary of Preliminary Analysis, and Policy Considerations

Before the
Public Utilities Commission of the State of California

C. The Uncertainty of the Longevity of the AMI System Compared to Other Resource Options Must Be Considered

In moving to an AMI system, meters will have solid state technology, which is a newer technology with sensitive electronic components. The generally-accepted lifespan for solid state meters and meters with electronic components is fifteen years, compared to the industry-average lifespan of thirty years for mechanical meters (*i.e.*, those currently in use today for the majority of residential customers). This shorter lifespan of the AMI meters will require more frequent replacement of meters and network components than we currently experience, including a large "bubble" beginning fifteen years after the AMI implementation, where many, if not all, AMI meters will again have to be replaced.

Application of San Diego Gas & Electric Company (U-902-E) for Adoption of an Advanced Metering Infrastructure Deployment Scenario and Associated Cost Recovery and Rate Design.

C. Terminal Year in Planning Horizon (2021)

As established by the July 21, 2004 ACR, SDG&E's AMI planning and analysis horizon is 2005-2021. Financial analysis methods require that the terminal year, 2021, capture benefits and costs that extend beyond this planning horizon. Conceptually, remaining assets will eventually be replaced and benefits will continue to accrue beyond 2021. SDG&E has abstracted assumptions based on speculation of specific replacement timing and costs for AMI meters and communications equipment. AMI meters and communications equipment are assumed to have a 15 year book life, and are modeled as such in the revenue requirements calculations. However, SDG&E's cost and benefit analysis (total societal benefits), incorporates simplifying assumptions to value the remaining book life of assets extending beyond 2021, as a lump-sum asset in 2021. Therefore, Chapter 6 of my cost and benefits testimony contains this calculation for terminal asset values.

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PP&L PUC Testimony

PPL Electric Utilities Corporation

BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

Direct Testimony of Douglas A. Krall

Docket No. R-00049255

Q. How do these benefits compare to the costs of the AMR installation?

A. The $160 million in capital cost has, associated with it, a net present worth of carrying charges over its 15-year life of $198 million. It is estimated that the benefits described above provide a cumulative net present worth economic value of $205 million over the same period. The difference between the two indicates that revenue requirements will be lower with AMR than they would be without AMR over time.

ATTACHMENT B
ANSWER TO QUESTION 6.4

GROSS SAVINGS PER METER

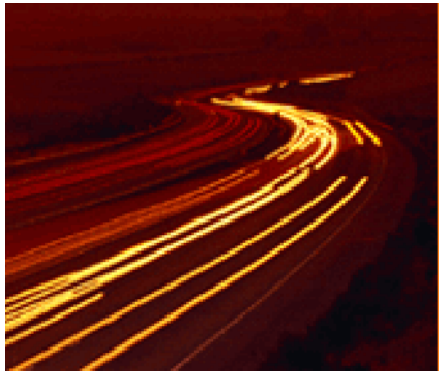
AMI Network: Savings per Meter

September 7, 2011

Average Savings per Meter
North American Utilities

AMI Function	Range of gross average savings per meter[1] (US$, 2009/year) Min	Max	Gross savings per meter (US$, 2009/year) Hydro-Quebec
Meter Reading Automation In 2009, the gross average savings per meter (per year over the lifespan of the meter) varied around US$5/year when the size of the meter reading activity automation was smaller (e.g. change from AMR to AMI technology for meter reading – semiautomatic to automatic meter reading). The gross average savings per varied around US$15/year when the size of the meter reading activity automation was larger (e.g. change from a completely manual meter reading process to AMI technology – manual to automatic meter reading).	**5**	**15**	13.37*

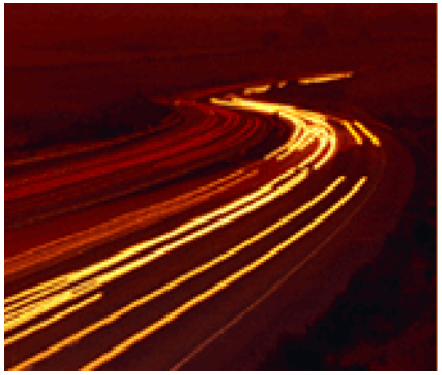
* For the Distributor, it involves recurring annual savings that will be effective in 2020, that had been actualized to 2009 US dollars; calculation done to make the data comparable to that from benchmark companies.



Average Savings per Meter
North American Utilities

AMI Function	Range of gross average savings per meter[1] (US$, 2009/year) Min	Max	Gross savings per meter Hydro-Quebec
Remote Connection/Disconnection In 2009, the gross average savings per meter (per year over the lifespan of the meter) varied around US$0.50/year when the scope of use of the remote connection/disconnection function was reduced[2] (e.g. function used only for collection activities). The gross average savings per meter varied around US$8.50/year when the scope of use of the remote connection/disconnection function was greater (e.g. use of the function for activities including collection, moving in/moving out, etc.).	0.5	8.5	1.99

*For the Distributor, the savings comes from the use of the connection/disconnection function only in conjunction with the collection process; calculation done to make the data comparable to that from benchmarked and companies.



accenture

Sources

- [1]Accenture. (2009). *Benchmarking of North American AMR-AMI Initiatives*
- [2]Chartwell. (October 2008). *Making the Case for Remote Connect/Disconnect.*

ATTACHMENT C
ANSWER TO QUESTION 12.1

SENSITIVITY ANALYSES

Margin for Manoeuvre on the Gross Revenue

	M$ (actualized to 2011)	
	720.1	Total investment, AMI Scenario
A	371.2	Investment subject to variation *Investments excluding purchase of meters and IT infrastructure*
B	289.7	Savings from AMI Scenario = Difference (AMI Scenario – Reference Scenario)
C	54.38%	Increase in investments needed to cancel 100% of the savings *expressed as a percentage (rounded to 54%)*
D = C * A	201.9	Increase in investments needed to cancel 100% of the savings *expressed in M$*
E = D – B	**-87.8**	Breakeven point in consideration of $87.8 million actualized of IT infrastructure

	2013	2014	2015	2016	2017	2018	Total
Employees to be relocated	**67**	**80**	**75**	**16**	**1**	**40**	**279**

Base AMI Scenario	**current K$**								**Act. K$**
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Total**	**AV**
Relocation Cost	**7,062**	**8,642**	**11,248**	**3,399**	**585**	**5,280**	**2,942**	**39,158**	**32,513**

Assumptions:

1. The average period for the relocation of an employee in an urban region is at most six months.
2. The average period for the relocation of an employee in a semi-urban region is at most 12 months.
3. The average period for the relocation of an employee in a rural region is at most 24 months.

Sensitivity Analysis	**current K$**								**Act. K$**
	2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**Total**	**AV**
Relocation Cost	**7,723**	**17,720**	**20,132**	**12,161**	**2,257**	**5,934**	**5,686**	**71,613**	**59,069**

Assumption that the relocation period for an employee would be 24 months

Results of Sensitivity Analysis **Relocation Cost**	
	Gross Revenue **act K$**
Relocation cost: AMI – base scenario *6-12-24 months*	**32,513**
Relocation cost: sensitivity *24 months*	**59,069**
Differential	**(26,555)**

Nominal actualization rate (D-2011-028) 6,099%