



Dennis Swanson  
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February 7, 2013

**Via Email**

Mr. Keith Miles  
1580 McBeth Street  
Trail, BC V1R 1Z4

Dear Mr. Miles:

**Re: FortisBC Inc. (FortisBC or the Company) Application for a Certificate of Public Convenience and Necessity (CPCN) for the Advanced Metering Infrastructure Project – Information Requests on Keith Miles' Evidence**

Please find attached FortisBC's Information Requests with respect to your evidence filed in the Company's Application for a CPCN for the Advanced Metering Infrastructure Project.

Sincerely,

A handwritten signature in black ink, appearing to be "DS", with a horizontal line underneath.

Dennis Swanson  
Director, Regulatory Affairs

cc: Commission Secretary  
Registered Interveners

FortisBC Inc. (FortisBC or the Company) Application for a Certificate of Public Convenience and Necessity for the Advanced Metering Infrastructure Project	Submission Date: February 7, 2012
Information Request No. 1 to Keith Miles (Miles) Evidence (Exhibit C11-6; C11-7)	Page 1

1    **1.0    Reference:    Exhibit C11-6**

2            1.1    Please confirm that Mr. Miles is not seeking to be qualified as an expert witness.  
 3    If this confirmation is not provided, please answer questions 1.1.1 to 1.1.5:

4                    1.1.1    Please confirm that Mr. Miles does not have any academic qualifications  
 5                    or degrees in the fields of medicine or the health sciences.

6                    1.1.2    Please confirm that Mr. Miles is not a physician.

7                    1.1.3    Please confirm that Mr. Miles has never had any clinical experience with  
 8                    patients.

9                    1.1.4    Has Mr. Miles previously submitted evidence to and/or testified before  
 10                    courts or regulatory tribunals in Canada or the United States in relation to  
 11                    any of the following: the potential health effects of non-ionising radio  
 12                    frequency emission (“RF”), medicine or health sciences? If so, please  
 13                    submit a list that includes the date the evidence was submitted, the  
 14                    matter/docket under which the evidence was submitted, and the name of  
 15                    the court/regulatory tribunal.

16                    1.1.5    Has Mr. Miles ever previously been disqualified from acting as an expert  
 17                    witness before any courts or regulatory tribunals in Canada or the United  
 18                    States? If so, please submit a list of the date Mr. Miles was disqualified,  
 19                    the matter/docket under which the evidence was submitted, and the name  
 20                    of the court/regulatory tribunal.

21                    1.2    If in any respect the confirmation requested in 1.1.1 to 1.1.3 cannot be provided,  
 22                    please detail in what respect the statements are in error.

23    **2.0    Reference:    Exhibit C11-6 – Documents from the American Academy of**  
 24                    **Environmental Medicine**

25                    2.1    Mr. Miles has submitted documents from the American Academy of  
 26                    Environmental Medicine, located in Wichita, Kansas.

27                    2.1.1    Please confirm that Mr. Miles is not a member of the American Academy  
 28                    of Environmental Medicine.

29                    2.1.2    Please confirm that the certifying board for the American Academy of  
 30                    Environmental Medicine is the American Board of Environmental  
 31                    Medicine.

32                    2.1.3    Please confirm that the American Board of Medical Specialties is the  
 33                    largest, physician-led speciality certification organization in the United  
 34                    States.

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- 1           2.1.4 Please confirm that neither the American Academy of Environmental  
 2           Medicine nor the American Board of Environmental Medicine is  
 3           recognized by the American Board of Medical Specialities.
- 4           2.1.5 Please confirm that the American Board of Environmental Medicine does  
 5           not require any form of ongoing peer review in order for members to  
 6           maintain certification.
- 7           2.2 Please confirm that the American Academy of Environmental Medicine position  
 8           paper dated April 12, 2012 was submitted to the Michigan Public Service  
 9           Commission in opposition to the installation of smart meters in homes and  
 10          schools.
- 11          2.2.1 Please confirm that the Michigan Public Service Commission requested  
 12          the Smart Grid Technical Advisory Project, Lawrence Berkeley National  
 13          Laboratory to review the American Academy of Environmental Medicine  
 14          position paper.
- 15          2.2.2 Please provide a copy of the Smart Grid Technical Advisory Project report  
 16          dated April 18, 2012, located at: <http://eetd.lbl.gov/ea/emp/reports/aaem-042012.pdf>. Please confirm that the report states the following:  
 17
- 18
- 19          “Smart meters operate in the frequency range 902-928 MHz with an  
 20          intensity of 1W or less. The references cited in the AAEM submittal  
 21          appear to be for frequencies and exposures that are substantively  
 22          different than the very small fields measured from smart meters” (at p. 3)
- 23          ...
- 24          It is also important to note that there are two problems with the AAEM  
 25          claim that “*Electromagnetic field (EMF) hypersensitivity has been*  
 26          *documented in controlled and double blind placebo controlled conditions,*  
 27          *100% of subjects showed reproducible reactions to that frequency to*  
 28          *which they were most sensitive.”<sup>7</sup> First, there are documented*  
 29          disagreements to this reproducibility, and second, Cyril Smith, cited twice  
 30          by AAEM in connection with electromagnetic hypersensitivity studies,  
 31          notes in his overview of the field that “*The frequencies involved in living*  
 32          *systems are very precise, so much so that even the phase of a frequency*  
 33          *matters.”<sup>8</sup> Therefore, no extrapolation from another frequency is*  
 34          appropriate.
- 35          A detailed meta-analysis of available literature<sup>9</sup> found “no evidence of an  
 36          improved ability to detect EMF in ‘hypersensitive’ participants.” This is  
 37          further reinforced by the World Health Organization examination of  
 38          electromagnetic hypersensitivity (EHS) that concludes “Well controlled

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1 double-blind studies have shown that symptoms were not correlated with  
 2 EMF exposure.”<sup>10</sup>

3 More importantly, the references cited by AAEM to describe particular  
 4 frequency sensitivities among self identified electromagnetic  
 5 hypersensitive individuals (citations 22, 23, and 26) identify a large  
 6 number of very specific frequencies, none of which is related to smart  
 7 meter operations. (at pp.4-5)

8 ...

9 According to recent measurements<sup>11</sup>, smart meters contribute a small  
 10 fraction of the total RF emissions in a typical environment. Eliminating  
 11 smart meters entirely would produce a minimal reduction in total existing  
 12 RF exposures to which the general population is routinely exposed. (at p.  
 13 5)

14 **3.0 Reference: Exhibit C11-6 – “The State of Scientific Research As to Whether**  
 15 **Advanced Meters Transmitting By Radiofrequencies, as Proposed in**  
 16 **the Present Case, May Constitute a Risk of Serious or Irreversible**  
 17 **Damage to Health”, by David O. Carpenter (the Quebec Carpenter**  
 18 **Report)**

19 3.1 The Quebec Carpenter Report is described on its cover page as being for a  
 20 proceeding before the Régie de l'Énergie / Energy Board (**Quebec Board**)  
 21 concerning “Authorization of an Investment by Hydro-Quebec Distribution –  
 22 Advanced Metering Project Phase 1”.

23 3.1.1 Please refer to the translation of the Quebec Board's Decision D-2012-  
 24 127 which is Attachment Miles IR1 3.1.1 and confirm that the Régie de  
 25 l'Énergie / Energy Board said the following of the Quebec Carpenter  
 26 Report:

27 *[408] S.É./AQLPA requested the Board to recognise him as an*  
 28 *expert witness and public health physician, including health risks*  
 29 *associated with exposure to RF fields.*

30  
 31 *[409] The Board rejected granting the requested expert status<sup>280</sup>*  
 32 *on the grounds that David Carpenter is not a physician, never had*  
 33 *any clinical experience with patients and never personally*  
 34 *performed any research on health effects of RF fields. However,*  
 35 *the Board did not reject his testimony in this case because of his*  
 36 *knowledge on research performed by others in this field. It*  
 37 *therefore accepted this testimony, subject to establishing the*  
 38 *probative value to be granted to such testimony.<sup>281</sup>*





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*Q. [38] Research physician?*

*A. So, the answer is definitely yes. Now, the term "physician" in general means you have a medical education. There certainly have been some people that have abused that term, that have other degrees, but the term "Public Health Physician" in general implies that someone is not licensed to practice medicine, but they're trained in public health.*

*New York State Education Law, article 131, paragraph 6522 :*

*§6522. Practice of medicine and use of title "physician".  
Only a person licensed or otherwise authorized under this article shall practice medicine or use the title "physician".*

*[154] Mr. Carpenter admits that he has never conducted research on radiofrequencies either himself or within a group<sup>145</sup>. The only articles in which Mr. Carpenter may have taken part are opinion-based and all against RFs<sup>146</sup>.*

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<sup>142</sup> Website of the State University of New York at Albany: <http://www.albany.edu/news/experts/8212.php>. Résumé of Mr. Carpenter, C-SE-AQLPA-0060, page 1, page 48, N.S., May 17, 2012.

<sup>143</sup> Testimony of D. Carpenter, N.S., May 17, 2012, at pp. 48-49.

<sup>144</sup> Testimony of D. Carpenter, N.S., May 17, 2012, at pp. 48-52; New York State Education Law, article 13 I, para. 6522.

<sup>145</sup> Testimony of D. Carpenter, N.S., May 17, 2012, at pp. 52 and 64.

<sup>146</sup> Testimony of D. Carpenter, N.S., May 17, 2012, at pp. 60 et seq.

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*[155] Mr. Carpenter acted as a co-editor of the Biolnitiative Report<sup>147</sup>, which was considered at length. It was his greatest involvement in a project focusing on RFs. However, the report was widely criticized, as admits Mr. Carpenter<sup>148</sup>, and, in fact, was not supported by any scientific group:*

*But I think it's fair to say that there's been more criticism than official groups that have supported it. I wouldn't deny that.<sup>149</sup>*

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1                                    *[156] Mr. Carpenter never testified as an expert witness in a*  
2                                    *case dealing with radiofrequencies, and no court ever considered*  
3                                    *him to be an expert in the field. Only once did he file a written*  
4                                    *statement, but the trial has not yet taken place<sup>150</sup>. In fact, it should*  
5                                    *be added that, to our knowledge, Mr. Carpenter's testimony was*  
6                                    *never retained by a court; instead, his methodology and neutrality*  
7                                    *have been criticized<sup>150</sup>.*

8                                    *[157] It should furthermore be emphasized that Mr. Carpenter*  
9                                    *did not bother to inquire about the technical features of the meters*  
10                                   *under review<sup>152</sup>.*

11                                   *A. The only information I have is what is in my, the early*  
12                                   *part of my report.*

13                                   *Q. [94] Nothing else?*

14                                   *A. Nothing else.*

15                                   *Q. [95] Okay.*

16                                   *A. And again, that is not, that is second hand information.*

17                                   *[158] Mr. Carpenter's adversarial and argumentative position*  
18                                   *against smart meters became quite clear when a question was*  
19                                   *asked by the president, Mr. Lassonde, when referring to a report*  
20                                   *in which Mr. Carpenter wrote<sup>153</sup>.*

21                                   *Q. And then, you start by writing,*  
22                                   *The benefit of smart meters in entirety to the utilities, and is*  
23                                   *economic in nature. If they install smart meters, they can*  
24                                   *fire those individuals who at present are employed to go*  
25                                   *around reading meters. Thus, this is a job-killing proposal,*  
26                                   *and will increase unemployment in a state that already has*  
27                                   *too much.*

28                                   *I presume you refer to the State of New York?*

29                                   *A. That was the State of California.*

30                                   -----

31                                   <sup>147</sup> *David Carpenter & Cindy Sage, Bioinitiative Report: A*  
32                                   *Rationale for a Biologically-based Public Exposure Standard for*  
33                                   *Electromagnetic Fields (ELF and RF), August 31, 2007, filed as*  
34                                   *exhibit C-SEAQLPA-OOn, page 2.*

35                                   <sup>148</sup> *Testimony of D. Carpenter, N.S., May 17, 2012, page 73.*

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<sup>149</sup> *Testimony of D. Carpenter, N.S., May 17, 2012, page 73.*

<sup>150</sup> *Testimony of D. Carpenter, N.S., May 17, 2012, page 76.*

<sup>151</sup> *Darren Allgood et al. v. General Motors Corporation, 2006 U.S. Dist. Lexis 70764 (U.S. District Court for the Southern District of Indiana, Indianapolis), filed as exhibit 8-0133.*

<sup>152</sup> *Testimony of D. Carpenter, N.S., May 18, 2012, at pp. 50-51 and 53.*

<sup>153</sup> *Testimony of D. Carpenter, N.S., May 18, 2012, at pp. 219-221.*

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*Q. [485] And you conclude your comment on this report by saying,*

*Clearly, the answer to this dilemma is not to install wireless smartmeters to begin with.*

*[159] It is submitted that such a bias, so clearly expressed, is obviously enough to disregard Mr. Carpenter's testimony and report.*

*[160] Moreover, HQD respectfully submits that Mr. Carpenter's testimony as a de facto witness, who received a mandate to conduct an objective and complete review of the scientific literature for the possible and potential risks of RFs on human health must be completely set aside.*

*[161] In fact, Mr. Carpenter's cross-examination clearly showed that he did not conduct an objective and/or complete review of the literature, but rather tried to justify his own opinion, i.e., that radiofrequencies can cause non-thermal effects that, in his opinion, could cause an increased risk of cancer.*

*[162] Not only did Mr. Carpenter's cross-examination reveal a totally defective methodology, but also that he had failed to consider several serious studies having a completely opposite position. This obvious bias results in Mr. Carpenter's testimony being devoid of any evidentiary weight and the Regie can certainly not rely on it.*

*[163] Mr. Carpenter explained<sup>154</sup>:*

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*A. I think that I have included in this report every meta-analyses that I am aware of that has been written on the issue of radio frequency fields. And, to some degree, also on ELF fields. One of the reasons for focusing on meta-analyses is to save time and attention. [... ]*

*Q. Okay. So, your position is that if someone looks at all the references you made in your report, to researches, to articles, to meta-analyses, we can get a good sense of the state of the science as of now?*

*A. Yes, I do.*

*[164] However, despite that, Mr. Carpenter makes no reference to the meta-analysis prepared by Mr. Repacholi, nor to the study prepared by the CSST, although he admitted to being familiar with it.*

*[165] It should also be highlighted that several studies cited by Mr. Carpenter do not in any way uphold his findings. In other cases, he cited previous studies that arrived at conclusions that served his own purpose, while omitting more recent studies from the same authors that arrived at a different conclusion, i.e., the failure to show an increased risk of cancer following exposure to low-intensity RFs. We find this lack of intellectual thoroughness to be disastrous.*

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<sup>154</sup> *Testimony of D. Carpenter, N.S., May 18, 2012, at pp. 47 and 49.*

**DECISION**

**QUEBEC**

**REGIE DE L'ENERGIE {ENERGY BOARD}**

<b>D-2012-127</b>	<b>R-3770-2011</b>	<b>October 5, 2012</b>
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**IN THE PRESENCE OF:**

Richard Lassonde

Manager

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**Hydro-Quebec**

Complainant

and

**The Stakeholders, whose names appear below**

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**Final decision**

*An Application pertaining to an Authorisation for the Remote Reading Project, Phase 1*

**Stakeholders:**

- Association coopérative d'économie familiale de l'Outaouais (ACEFO) {Family Economics Cooperative Association of Outaouais Region};
- Association coopérative d'économie familiale de Québec (ACEFQ) {Cooperative Association of Family economics of Quebec};
- Association des redistributeurs d'électricité du Québec (AREQ) {Association of Québec Electricity Redistributors};
- Fédération canadienne de l'entreprise indépendante (FCEI) {Canadian Federation of Independent Enterprises};
- Groupe de Recherche Appliquée en Macroécologie (GRAME) {Group for Applied Research in Macroecology};
- Option consommateurs (OC) {Consumers' Option};
- Regroupement des Organismes Environnementaux en Énergie (ROEÉ) {Merger of Environmental Organizations for Energy};
- Regroupement national des conseils régionaux de l'environnement du Québec (RNCREQ) {Quebec National Merger of Regional Councils for the Environment};
- Stratégies énergétiques et Association québécoise de lutte contre la pollution atmosphérique (S.É./AQLPA) {Energy Strategies and Quebec Association Against Air Pollution};
- Syndicat des employé-e-s de techniques professionnelles et de bureau d'Hydro-Québec, Section locale 2000 (SCFP-FTQ) {Hydro-Quebec Professional Techniques and Office Employees' Union, local 2000};
- Union des consommateurs (UC) {Consumers' Association};
- Union des municipalités du Québec (UMQ) {Association of Quebec Municipalities}.

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## 1. THE APPLICATION.

[1] On June 30, 2011, in the framework of its business operations as an electrical power Distributor, Hydro-Quebec (the Distributor) filed with the Board an application to obtain the authorisation required to acquire, construct, or dispose of, property or assets to be used for distribution of electrical power, in the framework of Phase 1 of the Remote Reading Project (the Project). This application was submitted under Section 73 of the *Loi sur la Régie de l'énergie*<sup>2</sup> {The Act on The Energy Board} ("The Act")<sup>1</sup>.

[2] During the three Project phases, the Distributor will replace 3.75 million electricity meters used for measuring all its customers' electrical consumption, except for large consumption customers (L Rate), with Next Generation Electricity Meters (CNGs). During Phase 1 of the Project, the Distributor wishes to implement an Advanced Metering Infrastructure (IMA) and complementary Information Technologies (IT). The 3 phases comprised in this project should be spread over a period from 2010 to 2017.<sup>2</sup>

[3] The project is more fully described in Section 7.2 of this Decision.

## 2. THE PROCEEDINGS.

[4] The Board received requests for input from: ACEFO, ACEFQ, AREQ, FCEI, GRAME, OC, ROEÉ, RNCREQ, S.É./AQLPA, SCFP-FTQ, UC, and UMQ.

[5] On August 18, 2011, the Board granted a Stakeholder status to all relevant individuals who are mentioned in the preceding paragraph by its D-2011-124 Decision.

[6] From October to December 2011, the Board received written submissions and additional documentation from the Stakeholders, and from experts.

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<sup>1</sup> R.S.Q., Ch. R-6.0 1.

<sup>2</sup> Exhibit B-0006, page 7.

[7] On February 2nd, 2012, the Board held a preliminary meeting and, among other things, asked the Distributor to offer a solution for subscribers who would not wish any installation of a CNG.

[8] In response to this request from the Board, the Distributor filed an application (R-3788-2012) to amend its Terms of Service and Rates, so they include an opt-out option (the Opt-out option) for customers who reject use of a CNG.

[9] During formal public hearings held on the following dates: March 19, 20, 21, 22, 23, 27, 28, 29 and 30, 2012; April 4, 5, 26 and 30, 2012; and May 17, 18 and 22, 2012, the Board heard the participants in this case.

[10] The participants submitted their written arguments from June 8 to July 4, 2012 and the Board started its deliberations on July 13, 2012.

### **3. FRAMEWORK TO ANALYSE AN APPLICATION UNDER SECTION 73 OF THE ACT.**

[11] Under Section 73 of the Act, the Distributor must obtain permission from the Board, under the requirements and in the cases it specified through regulation, in order to acquire, construct, or dispose of, any property or assets intended for electrical power distribution.

[12] Under Section 2 of the *Règlement sur les conditions et les cas requérant une autorisation de la Régie de l'énergie* {Regulation on requirements and cases where The Energy Board's authorisation is required}<sup>3</sup> (the Regulation), a request for investment projects exceeding \$10 million must be accompanied by the following information:

- Project objectives;
- Project description;
- Justification of the project in relation to its objectives;
- Costs associated with the project;
- The economic feasibility of the project;

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<sup>3</sup> (2001) 133 G.O. II, 6165.

- A list of all approvals required under other laws;
- The impact on rates, including a sensitivity analysis;
- The impact on reliability of the electricity distribution network;
- Where appropriate, other alternatives offered, along with information referred to in above paragraphs.

[13] In its D-2011-124 Decision, the Board pointed out the analytical framework of an application under Section 73 of the Act:

*"[29] Section 73 of the Act - as read and applied in context - and the Regulation on requirements and cases where The Energy Board's authorisation is required [Footnote omitted] impose an analytical framework which essentially makes the following issues relevant:*

- What are the objectives of the Project?*
- Are such objectives useful or necessary for a power distribution service?*
- Is the Project justified in relation to its objectives?*
- Are costs associated with the Project justified and reasonable?*
- Are feasibility studies and sensitivity analyses satisfactory?*
- What is the Project's cost impact on electrical power distribution rates?*
- What is the Project's impact on the quality of service delivery for electrical power?*
- Were other alternatives considered by the Distributor to meet its intended objectives?<sup>4</sup>*

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<sup>4</sup> Exhibit A-0003, page 9.

#### 4. THE DISTRIBUTOR'S POSITION.

[14] Firstly, the Distributor notes its burden of proof:

*"[13] Under the regulatory framework which applies to this request, HQD did not have the following responsibilities:*

- *Test all aspects of a project in a real situation;*
- *Provide for worst-case scenarios;*
- *Submit proof of complete integration of all systems.*

[... ]

*[17] Thus, even though this issue is significant in terms of the number of meters which should be installed during a short period of time, this issue should not be treated differently from other files where an investment authorisation is required; as defined by the Board, and before hearings may commence, the framework must be proper. HQD's burden of proof must remain the same, and the Distributor requests the Board to avoid any diversion some Stakeholders are attempting."*<sup>5</sup>

##### 4.1 THE PROJECT'S OBJECTIVES.

[15] The Project's objectives are as follows:

- The sustainability of the meter fleet;
- Achieving better efficiency gains from automating consumption reading, as well as remote service disconnection/reconnection;
- A possible technological evolution, which may eventually allow new services to customers, and implement network management actions.<sup>6</sup>

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<sup>5</sup> Exhibit B-0163, pages 5 and 6.

<sup>6</sup> Exhibit B-0163, pages 6 and 7.

[16] The Project *"follows a heavy trend in this industry, and is almost required to face technology challenges, as well as sound management of its fleet, which the Distributor will inevitably face in the medium term if it were to maintain the status quo. Such fact may not be ignored; since the status quo is not a realistic option, as it would generate many difficulties which are likely to be costly."*<sup>7</sup>

## 4.2 PROJECT DESCRIPTION.

### 4.2.1 PROJECT SCOPE.

[17] The Distributor limited the Project scope to *"the implementation of AMI information technologies, to replacement of existing meters by New Generation Meters (CNGs), as well to automation of readings, and to remote service disconnection/reconnection [Footnote omitted]. The project being reviewed does not plan any implementation of other features as suggested by some Stakeholders."*<sup>8</sup>

[18] The Distributor mentions that this targeted approach was suggested by a review of the experience of some electrical power distribution companies which developed a CNG deployment project, with a larger scope. Thus, the actual start of many features as soon as a project was implemented often led to difficulties the Distributor wishes to avoid; for example:

- A complex project, which the customer will have difficulty in adopting;
- A customer who needs to get used to a new meter, new rates or displays in homes;
- Delays in relation to projected deadlines.<sup>9</sup>

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<sup>7</sup> Exhibit B-0163, page 7.

<sup>8</sup> Exhibit B-0163, page 7.

<sup>9</sup> Exhibit B-0163, page 7.

[19] The Distributor mentioned that as selected, the Project scope has the advantage of focusing on its business objectives and minimise financial risk, since the main aspect of the plan is based on efficiency gains for readings and connections/disconnections.<sup>10</sup> Such expected efficiency gains should enable the Distributor to generate concrete benefits.

[20] Despite its limited scope, the Project also aims at developing an advanced technology for ITs and AMI to meet the Distributor's or its customers' future needs.<sup>11</sup>

[21] However, before implementing additional features, the Distributor mentions that beforehand, the following should be ascertained:

- Any feature must meet the customers and/or the Distributor's future needs;
- An analysis of costs and benefits shows that implementation of such features will generate gains for customers and/or for the Distributor;
- If applicable, an application for a specific authorisation is filed with the Board.<sup>12</sup>

[22] The Distributor notes the following elements from the Project assessment which was conducted by Accenture, which was commissioned by the Distributor in order to assess the Project:

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- *The initial scope is aligned with HQD's business requirements (focused on operational efficiency);*
- *The initial scope aims at generating tangible benefits in the short term;*
- *The initial scope was clearly defined during HQD's early thinking stages;*
- *The selected scope is advantageous as it allows focusing on specific features and follow the associated opportunity analysis;*
- *HQD followed best practices and various feedback;*
- *The option of developing additional features was taken into account (upgradability) [Footnote omitted]."*<sup>13</sup>

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<sup>10</sup> Exhibit A-0099, pages 32 to 34.

<sup>11</sup> Exhibit B-0163, page 8.

<sup>12</sup> Exhibit B-0163, page 8.

<sup>13</sup> Exhibit B-0163, page 8.

[23] On the development of new features, the Distributor plans on implementing as early as 2012 the management, and geographical track down, of any trouble. It also initiated studies on detecting electricity theft in order to use such feature as early as 2013.<sup>14</sup>

[24] Regardless of the Distributor's efforts for an eventual implementation of other features, it notes that *"demonstrating the Project's profitability relies exclusively on implementing two basic features for the IMA: meter reading, and remote connection/disconnection."*<sup>15</sup>

[25] On the Project scope, the Distributor concludes that *"all Stakeholders' proposals regarding features other than those presented by HQD should be considered beyond the issue by the Board and, as such, dismissed."*<sup>16</sup>

#### 4.2.2 THE TECHNOLOGICAL CHOICE.

[26] The Distributor describes AMI and CNG technology as follows:

*"[34] [...] Said meters have a bidirectional telecommunication capacity, enabling the delivery of data on customers' consumption to the Distributor's systems. Communications occur through radiofrequencies received by routers which are mainly arranged on HQD's existing facilities. In turn, said routers route carry captured information to collectors, which then send all information to the data acquisition node, located in the Distributor's data-processing centre. Said data is then validated and stored into the Meter Data Management System (MDMS) which also sends data to the company's systems, which, in turn, allow their use for billing purposes [Footnote omitted]."*

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<sup>14</sup> Exhibit B-0163, pages 8 and 9.

<sup>15</sup> Exhibit B-0163, page 10.

<sup>16</sup> Exhibit B-0163, page 10.

*[35] The new generation meters the Distributor plans on installing, are able to communicate among themselves in case they cannot communicate directly with a router due to any topographical obstruction or other. Thus, meters form a dynamic meshed network, which allows information relay at any time, regardless of any topographical hazards [Footnote omitted]."*<sup>17</sup>

[27] For Stakeholders who question its technological choice, and specifically, its decision to not consider options other than a meshed network, the Distributor replies that to make its choice:

*"[Its] calls for tenders were open to all available communication technologies. Only one bidder offered a solution which combined a meshed network with another type of technology; however, such solution was found to be economically non-profitable, and was thus excluded. All other bidders offered the technology which was ultimately selected by the Distributor [Footnote omitted]. Such endeavour demonstrate - and Accenture also confirmed in its report - that the technology selected by the Distributor follows a heavy trend that is currently observed in the market, which positions radiofrequency technologies of the meshed type at the forefront of AMI projects undertaken in North America [Footnote omitted]."*<sup>18</sup>

[28] The Distributor emphasizes that Mr. Finamore, the expert retained by GRAME, *"recognized that the Distributor's technological choice was appropriate and reflected the technology which is most widely used by other Distributors [Footnote omitted]."*<sup>19</sup>

[29] As for data security and integrity of systems that generate, communicate or store those, the Distributor notes that it made such matter a fundamental issue, and its calls for tenders resulted in the fact that proposed technologies met the highest levels of data security.<sup>20</sup>

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<sup>17</sup> Exhibit B-0163, pages 10 and 11.

<sup>18</sup> Exhibit B-0163, page 11.

<sup>19</sup> Exhibit B-0163, pages 11 and 12.

<sup>20</sup> Exhibit B-0163, page 12; and Exhibit A-0106, pages 54 and 59-61.

#### 4.2.3 PREPARATORY WORK, PILOT PROJECTS AND CONCLUSIONS.

[30] The Distributor notes the objectives of the pilot projects: <sup>21</sup>

- To test and confirm the level of connectivity, interoperability, and security of AMI components by conducting pilot projects in both urban and rural areas;
- To acquire a *Meter Data Management System (MDMS)* and a data acquisition node, and ensure their integration into Hydro-Quebec's technological infrastructure;
- To update the Project's business plan, by including actual negotiated costs through calls for tenders made during the preparatory work period;
- To determine the strategy, deadline and pace of deployment;
- To determine and implement the various required operational processes (temporary and permanent) as well as information systems required for AMI deployment;
- To determine the human resources management plan.

[31] According to the Distributor, pilot projects were structured as to be representative of conditions that would prevail during the Project's massive deployment. <sup>22</sup>

[32] In terms of meter volume, the Distributor specified that pilot projects have validated the correct operation of the system, i.e., from meter reading by the acquisition node, to customer's billing based on data collected. <sup>23</sup> Interoperability of MDMS and SAP systems was also confirmed. <sup>24</sup> These findings are also supported by Accenture. <sup>25</sup>

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<sup>21</sup> Exhibit B-0163, page 12.

<sup>22</sup> Exhibit B-0163, page 12.

<sup>23</sup> Exhibit B-0163, page 13.

<sup>24</sup> Exhibit B-0163, page 14.

<sup>25</sup> Exhibit B-0163, page 13.

[33] *Lofty Perch* confirmed the safety of data processed by the system, and validated that the Project meets recommendations of the *National Institute of Standards and Technology*<sup>26</sup>.

[34] The Distributor added that it was also able to test the connection/disconnection feature with a group of customer/employees residing in the area of the pilot projects.<sup>27</sup>

[35] According to the Distributor, pilot projects also helped develop a communication strategy, as well as validate the sensitivity analysis, the parameters of out-of-agreement costs, and the AMI system's bandwidth capacity.<sup>28</sup>

#### **4.2.4 ACQUISITION STRATEGY, CALLS FOR BIDS, AGREEMENTS AND CONTRACTUAL AGREEMENTS.**

[36] The Distributor mentioned that its strategy to act as the Project's prime contractor & integrator follows the industry's best practices, and helped obtain various bids from major companies in this field. In addition, rates obtained are considered competitive, and contractually set for more than 80% of the Project costs.<sup>29</sup>

#### **4.2.5 MASSIVE DEPLOYMENT OF THE PROJECT.**

[37] In its report, *Accenture* confirmed that the Distributor already applies all its recommendations, and believes implementation of the massive deployment could be done as efficiently as possible.<sup>30</sup>

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<sup>26</sup> Exhibit B-0163, page 15.

<sup>27</sup> Exhibit B-0163, pages 15 and 16.

<sup>28</sup> Exhibit B-0163, page 16.

<sup>29</sup> Exhibit B-0163, pages 17 and 18.

<sup>30</sup> Exhibit B-0163, page 18.

### 4.3 PROJECT JUSTIFICATION IN RELATION TO ITS OBJECTIVES.

[38] The Project has three objectives: sustainability of the meter fleet; efficiency gains; and upgradability of implemented technologies.

#### 4.3.1 SUSTAINABILITY OF THE METER FLEET.

[39] Three factors encourage the Distributor to accelerate the replacement rate of existing meters: their age, the S-S-06 Standard from Measurement Canada, and the inability to source electromechanical meters in the near future.<sup>31</sup>

[40] The Distributor's fleet is comprised of 3.75 million electricity meters, 79% of which are electromechanical meters, while 21% are electronic meters. In 2011, the average age of electromechanical meters was 26.8 years.

[41] According to the Distributor, this has several disadvantages: an increased risk of failing meters; an increase in service calls for corrective action instead of preventive service calls; potential difficulties to source equipment and services for technologies which are no longer supported; and a delay in developing expertise in new technologies, a situation exacerbated by many employees retiring.<sup>32</sup>

[42] Regarding the new S-S-06 Standard from Measurement Canada which applies to electronic meters, and which will apply to electromechanical meters in 2014, it will bring a greater volume of sampling and will limit the number of years during which a meter may be operating.<sup>33</sup>

[43] As concerns the problem of sourcing electromechanical meters, the Distributor mentions it will no longer be able to obtain this type of meters at the end of their useful life, because their production was stopped by almost all suppliers, in favour of electronic meters or CNGs.<sup>34</sup>

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<sup>31</sup> Exhibit B-0163, pages 18 and 19.

<sup>32</sup> Exhibit B-0163, pages 18 and 19.

<sup>33</sup> Exhibit B-0163, page 19.

<sup>34</sup> Exhibit B-0163, page 19.

#### 4.3.2 THE EFFICIENCY GAINS.

[44] Taking into account the Project cost, including the initial costs of \$87.8 million in IT, the Project is expected over 20 years to generate efficiency gains of more than \$200 million (discounted). At deployment end, the project is expected to generate annual recurring gains valued at \$81 million from the test year 2018. For 83%, such gains include those from reading activities, and 17% from other activities, i.e., collection (13%), customer activity (3%) and retrofitting (1%). These gains primarily result from a decrease in the company's payroll.<sup>35</sup>

[45] The Project's impact on human resources will result in the loss of 726 jobs by 2018. About this loss, the Distributor mentions:

*"[O]f such 726 positions to be eliminated, 180 (120 planned, and 60 expected) will include retirements which are already planned in the meter reading jobs. To this are added 270 temporary positions which will not be renewed, and 96 employee departures which occur due to regular rollover in this business. Therefore, 450 jobs (180 retirements and 270 temporary jobs) over the 726 jobs, were for all practical purposes already replaced as of October 31st, 2011. Employees to relocate were only 180 [Footnote omitted]."*<sup>36</sup>

[46] Thus, the Distributor estimates that 180 permanent employees should be relocated between 2012 and 2017, which is less than 300, as originally planned. However, the pool of available positions at the Distributor (800) and in other Hydro-Quebec divisions (1,350) is sufficient to relocate employees whose positions are eliminated.<sup>37</sup>

[47] The Distributor believes it will be able to rapidly achieve efficiency gains and do so with minimal impact on its employees.<sup>38</sup>

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<sup>35</sup> Exhibit B-0163, page 22.

<sup>36</sup> Exhibit B-0163, page 20.

<sup>37</sup> Exhibit B-0163, pages 21 and 32.

<sup>38</sup> Exhibit B-0163, page 21.

### 4.3.3 THE UPGRADABILITY.

[48] While the Project aims primarily at automating the reading process and performing remote connections/disconnections, the Distributor wishes to ultimately implement a smart network of the *Smart Grid* type that will enable AMI and CNGs. Thus, the Project is designed to integrate advanced features of a smart network.<sup>39</sup>

[49] The Distributor required from its meter suppliers that their technologies allow later implementation of additional features, such as confirmed by *Accenture*.<sup>40</sup>

[50] The *Near-Me Area Network (NAN) (Gridstream)* retained for the Project and which connects CNGs to each other, to routers and to collectors, should accommodate future features. The Distributor points out that under the Project's current scope, the Distributor will only use 5% of the available bandwidth of the NAN network. Thus, this network is able to dynamically "re-mesh", to question CNGs in order to obtain information, and to allow remote installation of new features - without any Distributor's employees traveling to customers' residences.<sup>41</sup>

## 4.4 COSTS ASSOCIATED WITH THE PROJECT.

[51] The three Project phases are expected to take place from 2010 to 2017. The total cost of work that will be performed, including preparatory work and pilot projects, is currently set at \$997.4 million. This amount includes investments of \$839.9 million, and operating expenses of \$157.4 million.

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<sup>39</sup> Exhibit B-0163, page 23.

<sup>40</sup> Exhibit B-0163, page 23.

<sup>41</sup> Exhibit B-0163, page 23.

**TABLE 1**  
**COST OF THE LAD PROJECT**

K\$ (current)	Preparatory Work <sup>1</sup>	2012	2013	2014	2015	2016	2017	TOTAL
Investments	36,736	86,574	247,128	205,054	145,985	69,704	48,783	839,964
TI Infrastructures	17,372	18,787	10,132	6,170	11,417	8,265	-	72,143
Project Office	7100	3083	-	-				10,183
Subtotal	12,264	64,704	236,996	198,884	134,568	61,439	48,783	757,638
Meters, Purchase & Installation	6,364	46,604	192,300	155,456	97,731	43,104	42,330	583,889
Telecommunication equipment	1,900	10,920	33,414	33,277	28,112	11,970	-	119,593
Project Office		3,083	5,238	5,343	5,299	5,405	5,356	29,724
Borrowing Costs to be capitalized		1,388	920	599	172	190	344	3,613
Others	4,000	2,709	5,124	4,209	3,254	770	753	20,819
Operating Costs	5,234	13,156	25,789	31,929	36,850	24,216	20,264	157,438
Relocation of Resources		-	7,062	8,642	11,248	3,399	585	30,936
Information Technologies	4,628	6,919	7,808	9,857	11,221	11,233	11,370	63,036
Telecommunication		1,084	1,834	2,906	3,952	4,590	4,727	19,093
Various Expenses	606	5,153	9,085	10,524	10,429	4,994	3,582	44,373
<b>TOTAL</b>	<b>41,970</b>	<b>99,730</b>	<b>272,917</b>	<b>236,983</b>	<b>182,835</b>	<b>93,920</b>	<b>69,047</b>	<b>997,402</b>

<sup>1</sup> Preparatory work (R-3723-2010) of \$42M over the 2010-2012 period

Source: Exhibit B-0006, page 34

[52] The Distributor notes that 82% of project costs are known and set by an agreement, including those of CNGs, telecommunications equipment, licenses of acquisition node, MDMS, CNG installation, topology services, telecommunication links, and costs of preparatory work and CNG internal installation. In addition, the Distributor adds it is certain it will benefit from the so-called "most favored nation" clause, under which any decrease in CNG and telecommunication equipment cost will be applied.

[53] The Distributor includes a contingency on the components of the Project cost which are likely to vary. A contingency amount of \$21 million was provided for investments, based on a 15% rate, applied to investments linked to IT and to telecommunications, and 12% applied to the cost of CNG installations performed internally and to other investments. A contingency amount of \$8 million (12%) on operating expenses is also provided for.<sup>42</sup>

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<sup>42</sup> Exhibit B-0163, page 25.

## 4.5 PROJECT FEASIBILITY, AND SENSITIVITY ANALYSIS.

### 4.5.1 PRESENTATION

[54] The Distributor compared the Project scenario, the AMI scenario, to a baseline scenario, in which the Distributor would continue business as usual, but with a higher rate of annual replacement of meters during the first five years. Both scenarios are analysed over a 20-year period.

[55] Per the AMI scenario, the Distributor would replace 3.81 million meters over five years, from 2012 to 2017. The Distributor's investments for implementing AMI's IT would be highest in 2011 and 2012. Investments dedicated to CNGs purchase and installation are highest in 2013-2017. The AMI scenario also includes reinvestments in 2018 and 2025 to reflect the useful life of AMI's IT. The amount of \$250 million is scheduled for CNG replacement after expiry of some meter batches. This sum is based on a replacement assumption of 28% of CNGs, or approximately 1,075,000 CNGs, between 2027 and 2031.<sup>43</sup>

[56] The baseline scenario aims at replacing all meters over the next 20 years. In this scenario, the existing electromechanical meters would be replaced with standard electronic meters at a rate ranging between 342,500 and 370,400 per year during the 2012-2016 period; this rate takes into account the current age of the meter fleet, and the tightening of Measurement Canada's S-S-06 Standard. From 2017 to 2031, the replacement rate would slow down to 138,000 per year. In this scenario, 600 employees equipped with hand-held microcomputers (*MOMs*) would read most meters, while other meters, including some business customers', would be read remotely.<sup>44</sup>

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<sup>43</sup> Exhibit B-0163, page 26.

<sup>44</sup> Exhibit B-0163, pages 26 and 27.

[57] A comparison of the two scenarios shows that replacement of the meter fleet over five years and the transition to remote reading is more economical than the baseline scenario, or than maintaining the Distributor's current practice and approach. Over 20 years, this cost reduction is \$289.7 million, discounted (2011), excluding the initial investment of \$87.8 million, discounted, required to set up AMI's IT.<sup>45</sup>

[58] The Project is expected to generate earnings of \$73.70 per meter, thus offsetting the implementation cost, as soon as 1.2 million meters are installed. Such volume must be achieved in the third quarter of 2013, that is, during Phase 1 of the Project.<sup>46</sup>

#### 4.5.2 SENSITIVITY ANALYSIS

[59] The Distributor performed a sensitivity analysis by increasing, on the one hand, redeployment costs of its employees, and on the other hand, investment costs.

[60] Supposing staff redeployment were more difficult than expected and cost the equivalent of two years of wages for all employees affected, this analysis shows that project costs would then increase by \$25 million (discounted), giving the Distributor yet more flexibility to justify choosing the AMI scenario (the Project).

[61] As concerns the increase in investments, the Distributor has assessed the variation in investment costs, which would eliminate the expected cost difference between the baseline scenario and the AMI scenario. The variation is expressed in proportion to the value of investments which are likely to vary. The results of this analysis demonstrate that costs which are not set by agreement should increase by 54% so the difference in costs between the scenarios is zero; hence, according to the Distributor, the robustness of THE AMI scenario.<sup>47</sup>

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<sup>45</sup> Exhibit B-0163, page 27.

<sup>46</sup> Exhibit B-0163, page 27.

<sup>47</sup> Exhibit B-0163, page 30.

[62] In addition, the economic analysis over 15 years instead of 20 years limits gains from the AMI deployment scenario. Nevertheless, the Distributor's analysis still demonstrates the Project robustness, since the AMI scenario remains very advantageous compared to the baseline scenario by providing \$216.4M in gains.<sup>48</sup>

[63] As more fully described in Section 7.4 of this decision, the Distributor also reviewed two hypothetical scenarios: (i) replacement of CNGs and of telecommunications equipment per the AMI scenario after 15 years and (ii) uniform annual replacement of existing meters with electronic meters per the baseline scenario.<sup>49</sup> Even with such assumptions, one finds that the AMI scenario remains advantageous compared to the baseline scenario.

#### **4.6 IMPACT ON RATES.**

[64] During the 2012-2017 period, the Project will exert upward pressure on rates. Maximum impact will occur in 2013, while the Distributor's required revenue should increase by \$95.8 million. However, from 2018, that is, after planned deployment is complete, the Project will help reduce the level of required revenue, thereby reducing long term pressure on rates.

#### **4.7 SOCIAL, ECONOMIC AND ENVIRONMENTAL CONCERNS.**

##### **4.7.1 IMPACT ON CUSTOMERS.**

[65] According to the Distributor, AMI technology will provide customers some tangible benefits: invoices issued on the basis of their actual consumption; no visits required at their homes for readings; and more accurate data, which will also help develop solutions benefitting the customer.<sup>51</sup>

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<sup>48</sup> Exhibit B-0163, page 31.

<sup>49</sup> Exhibit B-0163, page 31; and Exhibit B-0072, pages 16-20.

<sup>50</sup> Exhibit B-0163, pages 31 and 32.

<sup>51</sup> Exhibit B-0163, page 32.

[66] The Distributor stresses that data related to costumers' electricity consumption and processed by AMI technologies remain subject to privacy policies:

*"[132] Collected data on consumption are in a databank, and are not connected to a customer's name or any other personal information on such customer. Consumption data are transferred to various company systems, which contain information identifying customers, specifically for billing purposes and customer file update [Footnote omitted]. Moreover, protection of consumption data on the AMI network (not including customer's personal information) will be encrypted, and benefit from advanced security processes, which were already validated by pilot projects [Footnote omitted]."* <sup>52</sup>

[67] The Project will also enable remote connection/reconnection, and therefore, greater efficiency of the service.

[68] However, the Distributor emphasises that its policy and disconnection process will not be modified as a result of implementing the Project. Individual cases will still be treated on a per case basis. <sup>53</sup>

[69] Finally, the Distributor adds that term, scalable platform AMI technology will improve the quality of service fault management and customer service, including the reduction of intervention and more proactive management of the network. <sup>54</sup>

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<sup>52</sup> Exhibit B-0163, pages 32 and 33.

<sup>53</sup> Exhibit B-0163, page 33.

<sup>54</sup> Exhibit B-0163, page 33.

#### 4.7.2 IMPACT ON THE ENVIRONMENT AND HEALTH.

##### 4.7.2.1 *Standards established by Health Canada.*

[70] The Distributor states that CNGs pose no danger to its subscribers' health. It indicates that CNGs emit radiofrequencies (RF) at intensities which are thousands of times below standards set by Health Canada.

[71] According to Health Canada, CNGs transmit RF data in bursts, within a frequency range of 900 MHz. When measured inside and outside a home during such bursts, the level of these RF fields is well below the limits of human exposure as specified in its Safety Code 6, i.e. 6 W per sq. meter for a 6-minute exposure time at a distance greater than 0.2 m from the meter.<sup>55</sup> With such information, Health Canada concluded that exposure to RF fields radiated by CNGs poses no risk to public health.<sup>56</sup>

[72] The Distributor specified its method for calculating RF radiations:

*"[138] The method for calculating the power density, as prescribed by Health Canada (Safety Code 6) depends on the average exposure to electromagnetic waves over a 6-minute period. This method takes into account the covariance of electric and magnetic fields, at distances greater than 0.2 m. The Distributor calculated the average at a 1-meter distance from the meter [Footnote omitted]."*<sup>57</sup>

[73] The results of these calculations lead the Distributor to conclude that *"the power density radiated is 20,000 to 300,000 times below Health Canada's standards. For less than 1% of meters located close to a collector, that is, cases where RF fields are highest, radiations would still be about 3,600 times below standards set by Health Canada [Footnote omitted]."*<sup>58</sup>

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<sup>55</sup> "Limits of human exposure to radio-electrical electromagnetic energy in the 3 kHz-300 GHz range, Safety Code 6 (2009), Health Canada, p. 19, Table 6, Title: Exposure limits for uncontrolled environments."

<sup>56</sup> Exhibit B-0163, page 34.

<sup>57</sup> Exhibit B-0163, page 34.

<sup>58</sup> Exhibit B-0163, page 34.

[74] Also, the Distributor asserts that cumulative RF fields where several CNGs are located would not be a problem:

*"[140] Even when taking into account accumulated RF fields in environments where several electricity meters are located, the density of power radiated always remains well below standard. For example, even if a residence contains six (6) electricity meters, the cumulative power density will always be tens of thousands, even hundreds of thousands times lower than Health Canada's standard [Footnote omitted]. CRIQ {Quebec Industrial Research Centre} measured levels of radio frequency at less than one meter from electrical meters [Footnote omitted]. Again, the results are well below the standards set by Health Canada."*<sup>59</sup>

**4.7.2.2        *Precautions and position of Quebec's Department of Health and Social Services (MSSS).***

[75] Relying on Health Canada's opinion, the Distributor states that in today's science, nothing could justify why the Board would ignore Health Canada's standards and prohibit or restrict use of CNGs:

*"As exposure levels are well below Canadian and international safety limits, Health Canada believes no precautions are necessary to reduce exposure to RF energy from smart meters.*

*Where several smart meters are gathered as in some townhouses or tall buildings, total exposure remains well below the exposure established by Health Canada, due to intermittent transmissions."*<sup>60</sup>

[76] The Distributor mentions the opinion of MSSS, based on extensive scientific research in recent decades about possible adverse effects of RF fields on health, and whose results were assessed by various national and international organisations gathering experts from different disciplines:

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<sup>59</sup> Exhibit B-0163, page 34.

<sup>60</sup> Exhibit B-0163, page 35; and Exhibit B-0085, page 4.

*"Such organizations as the World Health Organization and Health Canada consider that to date no research brought significant evidence that exposure to RF fields at levels below those that induce heating of tissues can cause adverse health effects, [Distributor's emphasis] whether on the brain's electrical activity, on cognitive functions, on sleep, on heart rate, on blood pressure, etc. Similarly, studies failed to prove a causal relationship between exposure to RF fields and symptoms reported by individuals who purport 'electromagnetic hypersensitivity'.*

[. ..]

*Other studies focused on the long-term exposure to RF fields and carcinogen risks. Results from laboratory studies, including studies on animals, consistently show that there is no increased risk of cancer following prolonged exposure to RF fields. In humans, studies were conducted among cell phone users. Results from a series of epidemiological studies conducted in thirteen countries indicate that 'no increased risk of glioma or meningioma (brain cancer) could be established in connection with the use of cellular phones in adults over a period exceeding 10 years. [Distributor's emphasis]. Some signs of an increased risk of glioma were observed in some studies in 10% of heavy phone users, but biases and methodological errors could explain such observations [...].*

[...]

*In light of current scientific knowledge regarding RF fields and health, and taking into account the extremely low exposure levels to RF fields from Hydro-Quebec's new generation meters, the Ministry of Health and Social Services, in cooperation with public health directors of health agencies and social services, wishes to inform the population that RF fields radiated by such devices do not pose a risk to health [Distributor's emphasis] [...]." <sup>61</sup>*

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<sup>61</sup> Exhibit B-0163, pages 35 and 36; and Exhibit D-0062, page 5.

[77] The Distributor also refers to Dr. Michel Plante who stresses the difference, as concerns the radiation density of RF fields, between a cell phone and a CNG:

*"The cell phone is close, which results in about one watt per square meter, or one million (1 M) microwatts per square meter, if you understand me; while exposure to an electricity meter, when you are one meter away from the electricity meter, results in fifty (50) microwatts per square meter, fifty (50) millionths of a watt per square meter. So we're very very far from typical exposures of an individual who uses a cell phone."* <sup>62</sup>

[78] The Distributor also refers to the Health Effects from Radiofrequency Electromagnetic Fields report, produced by the Health Protection Agency (HPA) in the UK, which notably concludes as follows:

*The quantity, and in general quality, of research published on the potential health effects of RF field exposure has increased substantially since AGNIR last reviewed this subject. Population exposure to RF fields has become more widespread and heterogeneous. There are still imitations to the published research that preclude a definitive judgement, but evidence considered overall has not demonstrated any adverse health effects of RF field exposure below internationally accepted guideline levels. There are possible effects on EEG patterns, but these have not been conclusively established, and it is unclear whether such effects would have any health consequences. There is increasing evidence that RF field exposure below guideline level does not cause symptoms and cannot be detected by people, even by those who consider themselves sensitive to RF fields. The limited available data on other non-cancer outcomes show no effects of RF field exposure. The accumulating evidence on cancer risks, notably in relation to mobile phone use, is not definitive, but overall is increasingly in the direction of no material effect of exposure. There are few data, however, on risks beyond 15 years from first exposure. In summary, although a substantial amount of research has been conducted in this area, there is no convincing evidence that RF field exposure below guideline levels causes health effects in adults or children." [Distributor's emphasis]* <sup>63</sup>

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<sup>62</sup> Exhibit B-0163, page 37.

<sup>63</sup> Exhibit B-0163, pages 37 and 38.

[79] The Distributor also refers to the April 2011 report, commissioned by the Government of California to the California Council on Science and Technology (CCST), an independent non-profit organisation. The report specifically focuses on CNGs and RF fields:

"Thermal Effects

*The FCC has set limits on power densities from electronic devices that are well below the level where demonstrated biological impacts occur, and the limits are tens or hundreds of times higher than likely exposure from smart meters.*

Non-thermal Effects

*There currently is no conclusive scientific evidence pointing to a non-thermal cause-and-effect between human exposure to RF radiations and negative health impacts. For this reason, regulators and policy makers may be prudent to call for more research while continuing to base acceptable human RF exposure limits on currently proven scientific and engineering findings on known thermal effects, rather than on general concerns or speculation about possible unknown and as yet unproven non-thermal effects."* <sup>64</sup>

[80] Also, the Distributor makes some observations on the credibility and competence of S.É./AQLPA's witness, Dr. David O. Carpenter <sup>65</sup>. Such observations about him may be summarized as follows:

- On Albany State University's website, he introduces himself as having a doctorate; whereas the witness confirmed he holds an MD title but no PH.D.; <sup>66</sup>
- He does not have credentials to practice medicine;
- He uses the phrase "physician", and claims he is allowed to practice medicine in the USA, which is not correct; <sup>67</sup>

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<sup>64</sup> Exhibit B-0163, page 39.

<sup>65</sup> Exhibit B-0163, pages 39-43.

<sup>66</sup> Exhibit C-S.É./AQLPA-0060, page 1; Exhibit A-0148, page 48, and website of the State University of New York at Albany: <http://www.albany.edu/news/experts/8212.php>.

<sup>67</sup> "New York State Education Law, Section 131, paragraph 6522:§ 6522. Practice of medicine and use of title 'Physician'. Only a person licensed or authorised under this article shall practice medicine or use the title 'physician'."

- He admits he never himself lead or directed a research group on RF fields; the only papers he took part to on the subject display an opinion and all are against RF fields.<sup>68</sup>

- The *BioInitiative* report, being his largest involvement in a RF-focussed project, was widely criticized, as he himself admitted, and is not supported by any recognized scientific group.<sup>69</sup>

- His methodology and his neutrality were criticized by a Court;<sup>70</sup>

- He never testified as an expert witness in a case involving RF fields, and no court ever considered him an expert in the matter;<sup>71</sup>

- He has no knowledge of technical features of meters the Distributor plans on installing.<sup>72</sup>

[81] The Distributor concludes that Dr. Carpenter's testimony, acting as a factual witness mandated through S.É./AQLPA to perform an objective and comprehensive review of scientific literature on potential and possible RF fields risk to human health, must be completely eliminated.<sup>73</sup>

[82] For the Distributor, Dr. Carpenters' cross-examination shows that he did not carry out an objective and/or exhaustive review of the literature. He specifies that Dr. Carpenter failed to consider several serious studies which ran contrary to his position.<sup>74</sup>

[83] In the Distributor's opinion, Dr. Carpenter tried rather to justify his own opinion on CNGs, to the effect that RF fields they emit may potentially cause non-thermal effects leading to increased risk of cancers.<sup>75</sup>

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<sup>68</sup> Exhibit A-0148, pages 52 and 64; *ibid.* on pages 60 and further.

<sup>69</sup> Exhibit C-S.É./AQLPA-0076, page 2; and Exhibit A-0148, page 73.

<sup>70</sup> Exhibit B-0133.

<sup>71</sup> Exhibit A-0148, page 76.

<sup>72</sup> Exhibit A-0148, pages 50, 51, and 53.

<sup>73</sup> Exhibit B-0163, page 42.

<sup>74</sup> Exhibit B-0163, page 42; meta-analysis prepared by Repacholi and the study prepared by the CCST, of which he had knowledge.

<sup>75</sup> Exhibit B-0163, page 42.

#### **4.8 LIST OF PERMITS REQUIRED UNDER OTHER LEGISLATION.**

[84] The Distributor underlines that the Project, as such, was not authorised under other laws. Certificates of equipment compliance were filed with these proceedings. Except for CNGs which will be installed at customers' locations, the Distributor primarily installs AMI equipment on its own facilities (e.g., electric poles, etc.). Thus, no special legal authorisation is required for their installation.<sup>76</sup>

#### **4.9 CONCLUDING THE DISTRIBUTOR'S ARGUMENT.**

[85] Considering evidence and representations as filed, the Distributor requests the Board to authorise Phase 1 of the Project in accordance with requirements of Section 73 of the Act and related regulation.

### **5. THE STAKEHOLDERS' POSITIONS.**

#### **5.1 ACEFO.**

[86] The Board does not summarize ACEFO's position as it gives neither probative value to, nor appropriate use of, the document filed by Mr. Mounir Gouja on behalf of this Stakeholder. Mr. Gouja's cross-examination revealed that part of his document was plagiarized.<sup>77</sup> Such behaviour before the Board is unacceptable.

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<sup>76</sup> Exhibit B-O 163, page 31.

<sup>77</sup> Exhibit A-0128, pages 36-38, especially pages 8, 9 and 10 of the document, found on the Internet, published by Alcimed, a French company.

## 5.2 ACEFQ.

[87] Based on the criteria of profitability and impact on rates, ACEFQ requests the Board to reject the Project. This Stakeholder suggests the Board request the Distributor to provide a general smart network project, which would integrate all features which are profitable and useful for its customers, evaluate and compare the costs and profits of the various technological options, as well as safety risks and protection of privacy and personal information.<sup>78</sup>

[88] ACEFQ considers that there is no scientific consensus on the long-term biological effects of RF fields. This Stakeholder underlines that some experts as well as the Council of Europe suggest as a precaution to significantly reduce RF radiation thresholds to levels that would not be met by the Distributor's CNGs. Consequently, ACEFQ requested from the Board:

- In the presence of such scientific uncertainty, to apply the precautionary principle in accordance with the *Act on Sustainable Development*;<sup>80</sup>
- To dismiss the project currently proposed by the Distributor;
- To require the Distributor to introduce a new smart network project which should be more comprehensive and integrated, involving alternatives other than RF-radiating meters;
- To require the Distributor regularly to report on the progress of scientific knowledge about the health impacts of RF radiations; on the issue of electromagnetic hypersensitivity; and, should the project be accepted, to submit a report on health effects of its radiating meters.

[89] ACEFQ underlines that various Sections of *Hydro-Quebec's Terms of Service* (the Terms of service) show that the measuring function is solely intended for billing the amount of electricity consumed, approximately every 30 or 60 days, depending on power amount billed.<sup>81</sup>

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<sup>78</sup> Exhibit C-ACEFQ-0026, page 9.

<sup>79</sup> Exhibit C-ACEFQ-0026, page 12.

<sup>80</sup> L.R.Q. Ch. D-8.1.1.

<sup>81</sup> Exhibit C-ACEFQ-0026, page 14.

[90] In addition, the Stakeholder notes that the Distributor is subject to the Act on the free access to documents held by public bodies and on the protection of privacy<sup>82</sup> (the Access Act). Thus, the detailed information it will hold on any customer's consumption, if associated with the customer's name or any other information that identifies the customer, are personal information as defined by this Act.<sup>83</sup>

[91] ACEFQ proposes that the Distributor may not use meter readings to establish and analyse consumption patterns, as long as such use of consumption data is not appropriately monitored and provided for in the Terms of service.

### 5.3 FCEI.

[92] Theoretically, FCEI is in favour of integration of new measuring and network management technologies.<sup>84</sup> However, the profitability analysis carried out by this Stakeholder lead it to believe that the Project, as presented by the Distributor, is not profitable and would, according to its estimates, create higher costs than the baseline scenario in the approximate amount of \$51 million to 150 million.<sup>85</sup> In addition, the Project would include many risks which this Stakeholder believes were not properly assessed by the Distributor; specifically as concerns social rejection presently met by the Project, and the expected costs from the Opt-out option as proposed in File R-3788-2012.<sup>86</sup>

[93] With respect to technological choices, and economic analysis, this Stakeholder stresses that these issues are not addressed in Accenture's report.<sup>87</sup>

[94] FCEI also notes that the Distributor presented the Project while the Distributor had no general view of its duration (technological roadmap), which this Stakeholder considers not conducive to an optimal technological choice.<sup>88</sup>

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<sup>82</sup> L.R.Q, Ch. A-2.1.

<sup>83</sup> Exhibit C-ACEFQ-0026, page 14.

<sup>84</sup> Exhibit C-FCEI-0032, page 2.

<sup>85</sup> Exhibit C-FCEI-0032, page 30.

<sup>86</sup> Exhibit C-FCEI-0032, pages 32 and 33.

<sup>87</sup> Exhibit C-FCEI-0032, page 6.

<sup>88</sup> Exhibit C-FCEI-0032, pages 10 and 11.

[95] FCEI reviewed in detail the Project's economic analysis, submitted as evidence by UMQ, and specifically, the following aspects: volume of meter implementation according to AMI and baseline scenarios, sustainability of meters in AMI scenario, growth and efficiency of readings in the baseline scenario, costs of disconnection/reconnection, and calculation of residual values. On several of these analysed items, FCEI reached the conclusion that evidence from UMQ is more probative than evidence from the Distributor.<sup>89</sup>

[96] This Stakeholder also reviewed agreements, which according to the Distributor, set 80% of Project costs. To FCEI, the absence of any planned contingency on this portion of costs does not eliminate the risk of exceeding. Risks in deployment are allegedly poorly understood and assessed by the Distributor, despite a firm contract with CapGemini, the company mandated to deploy CNGs.<sup>90</sup>

[97] Nevertheless, FCEI finds that the project provides potential economic benefits outside the scope of the authorisation application, such as detecting theft, optimizing communication, detecting failures, controlling voltage, time differentiated billing, etc. Presented in another context, with some additional features, the Project could be profitable. The Stakeholder makes a proposal to avoid, if possible, any useless delay to the Project which seems, theoretically, unprofitable, but offers potential future profits. The goal of such proposal from FCEI is to avoid any unduly high risk on customers.

[98] Therefore, FCEI recommends the Board authorise the Distributor's application, provided it limits the level of authorised investment in accordance with profits from the Project.

[99] Furthermore, FCEI recommends the Board reject the Distributor's application, as filed.

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<sup>89</sup> Exhibit C-FCEI-0032, pages 11-20.

<sup>90</sup> Exhibit C-FCEI-0032, pages 25-30.

[100] Should the Board accept the Project as is, this Stakeholder recommends requiring quarterly monitoring of costs, deployment and performance of the Project, considering risks discussed in its closing arguments.<sup>91</sup> FCEI suggests the Project authorisation be subject to the following requirements:

*"312. The first \$90 million [Footnote omitted] of investments in the LAD project, being the excess in the AMI scenario cost, compared to baseline scenario, would be taken to a deferred charges account off base.*

*313. All subsequent variance between the actual cost and the LAD project budget [Footnote omitted] would be added, either to increase or decrease, to the balance of this account.*

*314. The balance of this account could possibly be reinstated in calculating the revenue required, but only if additional benefits from the introduction of new features or other optimization measures, which would not have been possible without the LAD project or would have been possible, but at a higher cost, were demonstrated."*<sup>92</sup>

#### **5.4 GRAME.**

[10 I] GRAME favours the deployment of smart technologies to collect consumption data which help integrate advanced features, such as time differentiated billing and demand management. Such features are used by 75% of distributors who adopted IMA.<sup>93</sup>

[102] GRAME underlines that the Project should enable the Distributor to develop options for consumption management as stated by the Board in its D-2011-162 Decision.<sup>94</sup>

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<sup>91</sup> Exhibit C-FCEI-0032, page 32.

<sup>92</sup> Exhibit C-FCEI-0032, page 31.

<sup>93</sup> Exhibit C-GRAME-0078, page 3.

<sup>94</sup> Exhibit C-GRAME-0078, page 4.

[103] In addition, GRAME believes the Project's investments should be more rapidly justified according to (i) the benefits of an AMI network for its customers, which would promote social acceptance of the Project by such customers, and (ii) environmental benefits connected to energy efficiency measures as is done in North America and elsewhere in the world.<sup>95</sup>

[104] According to Mr. P. Edmund P. Finamore, GRAME's expert, several elements of the Project which may impact its costs were not sufficiently validated in depth within pilot projects. And the results of these pilot projects should specifically confirm the Project's technological choices and its economic and financial viability.<sup>96</sup>

[105] GRAME's expert recommended pilot projects be furthered for an additional 6- to 12-month period and additional testing be carried out on all items that may reduce technological risks.

[106] Maintaining pilot projects should in particular help validate network topology, satellite communication, time required to install meters, Elster's (the other provider) CNGs, latency time and significance of the bandwidth within conditions of such pilot projects.

[107] In terms of network topology, the agreement between Rogers and the Distributor ensures a reading performance rate of 99.4%. According to GRAME, such contractual commitment would be guaranteed by 14,950 routers and 560 collectors. According to this Stakeholder, should this number be insufficient, the Distributor would pay for additional equipment.<sup>97</sup>

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<sup>95</sup> Exhibit C-GRAME-0078, pages 34 and 35.

<sup>96</sup> Exhibit C-GRAME-0078, pages 6-9.

<sup>97</sup> Exhibit C-GRAME-0078, pages 10 and 11.

[108] The Project provides that satellite communications will be used in places where digital cellular coverage is unavailable. GRAME underlines that according to the Distributor, AMI may not be relevant in some areas with a low density of users. Since pilot projects did not address this type of areas, the Stakeholder submits that in its business plan, the Distributor should consider the cost of satellite transmission services, particularly since the area served by Rogers does not cover the entire territory served by the Distributor.<sup>98</sup>

[109] With respect to installation of CNGs, GRAME recommends "*to extend pilot projects, in particular the Villeray pilot project, according to the initial deployment plan in order to validate the costs planned for installation of indoor meters. This should occur prior to approving costs related to preparatory work [...].*"

[110] GRAME expert is "*not convinced that results obtained by Capgemini during the Villeray pilot project are conclusive.*"<sup>99</sup>

[111] In addition, considering ongoing changes with the SAP system and standardization of exchanges with MDMS scheduled for the fall of 2012, the GRAME expert believes that pilot projects have not yet demonstrated that the replacement rate of 80,000 meters per month can be achieved not only physically, but also with the SAP system.<sup>100</sup>

[112] GRAME notes that Elster CNGs are still "*in the making.*" Integration of these meters to telecommunication infrastructure from Landis + Gyr has not yet occurred, whereas they will compose one fifth of all meters to be installed. This Stakeholder considers it essential that Elster's meters be tested prior to Project approval.<sup>101</sup>

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<sup>98</sup> Exhibit C-GRAME-0078, pages 11-14.

<sup>99</sup> Exhibit C-GRAME-0078, page 16.

<sup>100</sup> Exhibit C-GRAME-0078, page 17.

<sup>101</sup> Exhibit C-GRAME-0078, pages 17 and 18.

[113] According to GRAME, latency time and network bandwidth could limit deployment of new features in addition to basic functions of the Project. For example, this Stakeholder notes that the Distributor has no contractual guarantee concerning the usage rate of the bandwidth which would be useful to network evolution.<sup>102</sup>

[114] GRAME also notes that pilot projects have not demonstrated that the remote connection/disconnection feature is functional and highlights it is still not operational via the SAP billing system.<sup>103</sup>

[115] According to Mr. Finamore, the expert, the Project allegedly has a unique feature in North America since it combines the *Gridstream* system from Landis + Gyr for AMI and the *EnergyICT* system for MDMS with the SAP billing system for rates that can be modified over time.<sup>104</sup>

*"Valutech is not aware of any utility AMI system implementation that is currently using the combination of Landis+Gyr Gridstream two way communications for AMI, EnergyICT for MDM and SAP for billing advanced utility rates such as time-of-use in North America at this time. [Footnote omitted]"*

[116] Thus, GRAME endorses its expert's position that tests aimed at reducing technological risks were allegedly not fully carried out during pilot projects. In this regard, this Stakeholder referred to connectivity with satellites, to interoperability of Elster CNGs, and to implementation of a connection/disconnection feature from SAP.<sup>105</sup>

[117] GRAME recommends the Board at this time not authorise deployment of the Project's Phase 1, and wait for results from pilot projects extension.

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<sup>102</sup> Exhibit C-GRAME-0078, page 19.

<sup>103</sup> Exhibit C-GRAME-0078, page 27.

<sup>104</sup> Exhibit C-GRAME-0078, page 21.

<sup>105</sup> Exhibit C-GRAME-0078, page 32.

[118] Considering the Distributor's offer to provide accountability at a time deemed appropriate by the Board, GRAME also recommends that the Distributor update the Project budget following the results from extended pilot projects, prior to approving the Project.<sup>106</sup>

[119] This Stakeholder also recommends that the Distributor submit an impact study on the Project efficiency, which would take into account the exercise of Opt-out option by a realistic percentage of customers.<sup>107</sup>

## 5.5 OC.

[120] OC thoroughly reviewed the Project efficiency gains: "*The LAD project is an efficiency project and would be justified if the investment amounts required are sufficiently offset by efficiency gains they generate. Authorising such investments occurs thus mainly through 'the economic feasibility study of the project' [Footnote omitted] the Distributor must provide with its application.*"<sup>108</sup>

[121] According to OC, the Project as presented will exert upward pressure on revenue required from the Distributor during the Project's first few years, 2012-2017, and downward pressure on revenue required between 2018 and 2031. This Stakeholder thus stated that the initial increase in required revenue will be fully offset starting in 2026 only (in current dollars).<sup>109</sup>

[122] OC challenges many of the Distributor's assumptions made while it developed the Project's economic analysis, particularly in terms of the number of meters which must actually be replaced during the life of the Project.

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<sup>106</sup> Exhibit C-GRAME-0078, pages 28 and 29.

<sup>107</sup> Exhibit C-GRAME-0078, page 31.

<sup>108</sup> Exhibit C-OC-0021, page 4.

<sup>109</sup> Exhibit C-OC-0021, page 5.

[123] This Stakeholder refers to some items from the analysis performed by UMQ in respect to the AMI scenario; particularly the lack of equipment replacements due to defects, premature wear, or resulting from maintenance activities on the meter fleet. According to OC, using the single rate of meter replacement at the end of their lives is clearly insufficient.

[124] As to the baseline scenario, OC is not convinced it is necessary to quickly replace so many electromechanical meters during the first five years of this scenario, given the Distributor carries out proactive management of its meter fleet.<sup>110</sup>

[125] OC's analysis also covers the life of both the acquisition node and MDMS as well as assumptions about the cost of labor.

[126] This Stakeholder questioned the potential overvaluation increase of the Distributor's payroll. This Stakeholder also believes, as does UMQ, that the customer base growth should be taken into account in the scenarios' analysis economic, since increase of costs in both scenarios is not necessarily linear with each new electrical installation.

[127] As regards risks surrounding the project, OC underlines that the previous experience of cost escalation in the Customer Information System (CIS)<sup>112</sup> project must not occur again.

[128] This Stakeholder expresses concern that pilot projects were stopped before completion and underlines the Distributor largely undervalued the social acceptability issue surrounding the Project: "[...] *to this day, it is still difficult to assess customers' reaction faced with installation of smart meters. In this respect, it would have been very useful to achieve the 25,000 meter target originally scheduled by the Distributor.*"<sup>113</sup> Thus, efficiency gains could be zero if a large number of customers chose the Opt-out option.

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<sup>110</sup> Exhibit C-OC-0021, page 7.

<sup>111</sup> Exhibit C-OC-0021, pages 7 and 8.

<sup>112</sup> File R-3491-2002.

<sup>113</sup> Exhibit C-OC-0021, pages 9 and 10.

[129] OC believes the Distributor demonstrated unjustified rush in filing its Project authorisation application one month only after starting its pilot project. For this Stakeholder, this rushed action is all the more concerning when compared to the Distributor's caution in its application for authorisation of pilot projects and also considering the amounts involved and the history of the CIS project.

[130] OC finds that AMI and CNGs gradually become industry standards. According to this Stakeholder, deferral of the mass deployment would not affect the conditions which are favorable to the Project; this Stakeholder also believes that there is no urgency in deploying the Project.

[131] OC believes that through its technological advantages and all its features, the Project is positive for the Distributor and its customers, but considers the Distributor's authorisation application to be unsatisfactory.

[132] Therefore, this Stakeholder requests that the Project be rejected as submitted by the Distributor. This Stakeholder requests that the Distributor continue pilot projects, provide the population with better information, and conduct surveys to validate costs of the Opt-out option.

## 5.6 ROEÉ.

[133] ROEÉ supports the *Smart Grid* technology as it reduces energy consumption.<sup>114</sup> This Stakeholder considers that the entire AMI infrastructure should be taken into account for "*improving customer service and especially implementing features which provide environmental benefits*" and therefore, enable the Distributor "*to better sell the project as a move towards something positive.*"<sup>115</sup>

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<sup>114</sup> Exhibit C-ROEÉ-0087, page 2.

<sup>115</sup> Exhibit A-0135, page 158.

[134] ROEÉ understands the Distributor's business approach to deploy a new feature only after analysing its costs and benefits, but disagrees with applying that same approach for AMI choice and design. This Stakeholder recommends developing an overall roadmap that includes immediate addition of features being considered.<sup>116</sup>

[135] According to ROEÉ, such a plan should enable the Distributor to anticipate technology changes using the most up to date information available, and have an overall view of the Project which reflects both its views and its customers'.

[136] With such a plan, the Distributor could in the long term minimize issues regarding potential computer compatibility, insufficient storage memory for data, and availability of hardware in meters.

[137] ROEÉ considers that applying a case-by-case approach for future features but without previously developing an overall roadmap would considerably increase the risk of new problems.

[138] With respect to pilot projects, ROEÉ shares the position of several stakeholders on the need to extend those and even to introduce new ones in order to test all features which impact on hardware found in CNGs.<sup>117</sup>

[139] Thus, ROEÉ recommends allowing Phase 1 of the Project, provided that the Distributor develops and files a full architectural design or overall roadmap for the Project and continues pilot projects.<sup>118</sup>

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<sup>116</sup> Exhibit C-ROEÉ-0087, page 9.

<sup>117</sup> Exhibit C-ROEÉ-0087, page 10.

<sup>118</sup> Exhibit C-118 ROEÉ-0087, page 7.

## 5.7 RNCREQ.

[140] RNCREQ is convinced that introducing a smart network, including an AMI, could bring significant benefits to the Distributor's customers and to Quebec society overall. In principle, this Stakeholder favours implementing such a network.<sup>119</sup>

[141] However, according to RNCREQ, the Distributor's evidence does not prove the Project is justified in terms of efficiency gains. For this Stakeholder, economic gains over the three Project phases are few whereas risks associated with the Project are many.

[142] RNCREQ disagrees with the baseline scenario presented by the Distributor, specifically with the Distributor's assumption that all electronic meters which will replace electromechanical meters would still be read by readers equipped with MOMs.

[143] Indeed, electronic meters communicate via RF; they are readable at short distances, and could be read in a *drive-by* mode. RNCREQ therefore questions the Distributor's deliberate choice not to present a drive-by project as a baseline scenario.

[144] RNCREQ also notes that in the absence of an AMI project, the Distributor would not choose the status quo as a baseline scenario. According to this Stakeholder, such unrealistic representation of the baseline scenario, including adding costs that would normally be preventable, creates a wrong perception of the Project's profitability.

[145] RNCREQ also believes that the baseline scenario is wrong, as it provides no decrease in the cost of meter reading and the number of meter readers over the Project despite the fact that the proportion of electronic meters will go from 20% to 100% in 15 years approximately.

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<sup>119</sup> Exhibit C-RNCREQ-0049, page 12.

[146] In addition, this Stakeholder notes that the cost of installing n electronic meter used in the baseline scenario is very high, and is more akin to a *cost per part* than to a mass installation.<sup>120</sup>

[147] RNCREQ therefore submits that the baseline is not appropriate and leads to an overestimation of the gains discounts for AMI scenario,

[148] In addition, RNCREQ believes that technological developments could threaten the sustainability of the Project equipment. According to this Stakeholder, the rapid evolution of CNG technology and hardware requirements could create pressure to change CNGs before the end of their useful life. This would affect the sustainability of the meter fleet and the Project's expected profitability.<sup>121</sup>

[149] RNCREQ considers that these risks which were not taken into account by the Distributor may void expected financial profits, the latter remaining relatively small compared to amounts invested.<sup>122</sup>

[150] RNCREQ stresses that the project has a very limited scope and does not equip the Distributor's customers to manage and reduce their electricity consumption. The fact that the Distributor narrowly circumscribes the Project scope was, according to this Stakeholder, a significant strategic mistake.

[151] Thus, according to RNCREQ, the Project provides little or no direct and concrete benefits to the Distributor's customers; instead, it imposes rate increases for five years, with a potential view of savings in the long term.<sup>123</sup>

[152] In conclusion, this Stakeholder submits that the Project is not acceptable and should not be approved by the Board.

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<sup>120</sup> Exhibit C-RNCREQ-0049, pages 7 and 8.

<sup>121</sup> Exhibit C-RNCREQ-0049, page 3.

<sup>122</sup> Exhibit C-RNCREQ-0049, page 9.

<sup>123</sup> Exhibit C- RNCREQ-0049, page 12.

## 5.8 SCFP-FTQ.

[153] SCFP-FTQ believes the existing meter fleet is actually aging, but it is still reliable and meets Measurement Canada's standards. This meter fleet is made up for 45.6% of electromechanical meters aged between 25 and 60 years, which still work and fulfill their mandate.<sup>124</sup>

[154] SCFP-FTQ mentions that electromechanical meters are actually no longer made in North American factories but are available elsewhere on the market.

[155] With respect to electronic meters which are installed since a few years, this Stakeholder states they are available on the North American market at prices that are deemed competitive.<sup>125</sup>

[156] SCFP-FTQ is of the opinion that the project provides no tangible benefit to the Distributor's customers and the current reading system is adequate.<sup>126</sup>

[157] The Stakeholder states that:

*"For many households, meter reading by a reader is a procedure that not only generates no inconvenience but it is usually invisible. [...] For customers whose meter is located inside the residence, no evidence was given that they complained about the current procedure or that they approached Hydro-Quebec so they be spared from the reader's six times per year visits."*<sup>127</sup>

[158] SCFP-FTQ considers that under the scope defined by the Distributor, the Project's CNGs have almost nothing more to offer than the existing electromechanical and electronic meters.<sup>128</sup>

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<sup>124</sup> Exhibit C-SCFP-FTQ-0044, page 5.

<sup>125</sup> Exhibit C-125 SCFP-FTQ-0044, page 6.

<sup>126</sup> Exhibit C-126 SCFP-FTQ-0044, page 8.

<sup>127</sup> Exhibit C-127 SCFP-FTQ-0044, pages 9 and 10.

<sup>128</sup> Exhibit C-128 SCFP-FTQ-0044, page 14.

[159] Thus, this Stakeholder doubts that the Project is less costly than the status quo and that expected efficiency gains are sufficient to justify installing an AMI infrastructure.<sup>129</sup>

[160] In this regard, SCFP-FTQ discusses the problem of the volume of meters to be installed and replaced over a 20-year period of economic analysis.

[161] According to this Stakeholder's calculations, approximately 7.4 million meters should be purchased and installed over a 20-year period rather than the 3.8 million claimed by the Distributor. For SCFP-FTQ, this single datum would negate all benefits expected from the Project which were assessed to approximately \$200 million by the Distributor.<sup>130</sup>

[162] The analysis offered by the Distributor is not convincing to this Stakeholder, since the comparison between the AMI scenario and the baseline scenario is allegedly incorrect.<sup>131</sup>

[163] Consequently, SCFP-FTQ underlines that Project costs will exert upward pressure on the Distributor's rates. Ultimate installation of additional features can only have an upward impact on the Project's total cost.<sup>132</sup>

[164] Furthermore, SCFP-FTQ believes the Project creates collateral damage since total job losses would exceed the number of jobs that are directly affected by the Project. A total of nearly 1,000 jobs would thus be lost and the Project would therefore have a negative annual impact of \$14.7 million on Quebec's gross domestic product (GDP).<sup>133</sup>

[165] Thus, for SCFP-FTQ, "*HQD's assertion [that] the LAD project would therefore appear as a quasi requirement seems to us not only totally disproportionate, but also absolutely not based on proof.*"<sup>134</sup> This Stakeholder considers that the Project offers no real benefit to the Distributor's customers; that it mainly translates into many jobs lost; and that it is not profitable.

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<sup>129</sup> Exhibit C-SCFP-FTQ-0044, page 15.

<sup>130</sup> Exhibit C-SCFP-FTQ-0044, page 19.

<sup>131</sup> Exhibit C-SCFP-FTQ-0044, page 22.

<sup>132</sup> Exhibit C-SCFP-FTQ-0044, page 23.

<sup>133</sup> Exhibit C-SCFP-FTQ-0044, page 27.

<sup>134</sup> Exhibit C-SCFP-FTQ-0044, page 6.

## 5.9 S.É./AQLPA.

[166] S.É./AQLPA hopes the Project will eventually be carried out, but only when certain problems are solved. In particular, this Stakeholder refers to the social acceptability of the Project.<sup>135</sup>

[167] In this respect, the Stakeholder mentions the approach advocated by Accenture, as follows:

""Further efforts should be made to **be more proactive in direct communication with customers**, including **demonstrating gains in the short-, medium- and long-term from the AMI system**" [Footnote omitted] *and to* "**[e]nsure continuity** in the external communication strategy, by disseminating information on **the anticipated changes in a proactive manner, and focusing on tangible benefits for customers**." [Footnote omitted] "<sup>136</sup> [S.É./AQLPA emphasis.]

[168] For the project to generate greater social acceptance, S.É./AQLPA requests the Board to suspend review thereof, and order the Distributor present a new project which would specifically integrate planning of all phases of the Project, a framework for deployment of new features and a communication plan explaining the Project benefits to Customers.<sup>137</sup>

[169] S.É./AQLPA states that the Project is but a part of a broader set of projects from the Distributor aimed at developing a smart network, such as CATVAR (servo-controlled system of voltage and reactive power regulation)<sup>138</sup>, network automation, etc.

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<sup>135</sup> Exhibit C-S.É./AQLPA-0114, page 3.

<sup>136</sup> Exhibit C-S.É./AQLPA-0114, page 21.

<sup>137</sup> Exhibit C-S.É./AQLPA-0114, page 71.

<sup>138</sup> File R-3740-2010: Project to reduce energy consumption through optimized management of voltage in the distribution network.

<sup>139</sup> Exhibit C-139-S.É./AQLPA-0114, page 15.

[170] With respect to proposed and future features, this Stakeholder mentions Accenture's finding that "at this time, **little work was done with initiatives (e.g., CATVAR project) and related activities (e.g., operation and management of the distribution network, customer experience) of Hydro-Quebec Distribution** [Footnote omitted]." <sup>140</sup> [S.É./AQLPA emphasis].

[171] RF radiations and their impact on public health are central to S.É./AQLPA's concerns. For this Stakeholder, the precautionary principle should be applied and it offers mitigation measures it calls reasonable, efficient, ad realistic. <sup>141</sup>

[172] Therefore, S.É./AQLPA requests the Distributor to amend the Project, namely to reduce customers' exposure to RF fields from CNGs located inside buildings, in particular where several meters are located in one single inhabited room. <sup>142</sup>

[173] This Stakeholder offers some solutions to reduce exposure to RF fields:

- Installing a transmitting antenna outside the meter and the building;
- Reducing the meters' frequency of data radiation;
- Using a cable transmission rather than a wireless transmission;
- As a last resort, using non-communicating meters, including keeping existing electromechanical meters which still meet Measurement Canada's requirements. <sup>143</sup>

[174] Specifically, S.É./AQLPA requests that particular attention be paid to public buildings dedicated to health promotion or to care to potentially at risk people, or CNG-free areas and neighborhoods.

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<sup>140</sup> Exhibit C-S.É./AQLPA-0114, page 23.

<sup>141</sup> Exhibit C-S.É./AQLPA-0114, pages 45-70.

<sup>142</sup> Exhibit C-S.É./AQLPA-0114, page 71.

<sup>143</sup> Exhibit C-S.É./AQLPA-0114, pages 72 and 73.

[175] To justify the application of the precautionary principle, S.É./AQLPA submits that the power density near CNGs may exceed the precautionary threshold set at 100  $\mu\text{W}/\text{sq. meter}$  and advocated by some organizations when, on the one hand, occupants of a building live at 20 centimeters or less from an electricity meter, and when, on the other hand, electricity meters are multiple.<sup>144</sup> Yet, this 100  $\mu\text{W}/\text{sq. meter}$  is allegedly recommended by *BioInitiative* and the Parliamentary Assembly of the Council of Europe as concerns exposure to CNGs installed inside rooms.

[176] S.É./AQLPA refers to Dr. David O. Carpenter's testimony as expressed during the hearing and submitting that the world scientific community would be of deeply divided opinions about the impact of RF fields on health.<sup>145</sup>

[177] In addition, according to its own review of studies and scientific papers, this Stakeholder states there is an alleged health risk when exposure level to RF fields inside of lived-in space in a building exceeds 100  $\mu\text{W}/\text{sq. meter}$  while the standard for RF thermal effects is 6  $\text{W}/\text{sq. meter}$ .

[178] S.É./AQLPA's position in this regard can be summarized as follows:

***"65 - In light of all these studies, if the question is to determine whether current knowledge establishes a scientific certainty that exposure to RF fields may have biological or health effects (leukemia, brain tumors, neurological effects, etc.) below the threshold of thermal effects, then the answer remains negative.***

***However, if the question is to determine whether current knowledge establishes a risk of such biological effects and health effects (leukemia, brain tumors, neurological effects, etc.), then the answer is positive."***<sup>146</sup>

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<sup>144</sup> Exhibit C-144 S.É./AQLPA-0114, page 45.

<sup>145</sup> Exhibit C-145 S.É./AQLPA-0114, page 50.

<sup>146</sup> Exhibit C-146 S.É./AQLPA-0114, page 54.

## 5.10 UC.

[179] UC considers the Project is not a typical project for the Distributor and is particularly concerned about its impact on residential customers and distribution of costs & profits between the Distributor and customers.<sup>147</sup>

[180] In case of cost overruns for the Project, UC recommends the Board limit the risk that the Distributor's customers may incur by determining a maximum level of contingencies beyond which the Distributor would be responsible for any excess costs beyond its original forecast.<sup>148</sup> This Stakeholder therefore suggests the Distributor should agree to pay all costs of the three phases of Project when higher than expected in these proceedings case for the entire Project, or \$997.4 million.

[181] In addition, UC submits that the Project would not be profitable, since analysis of its impact on revenue required from the Distributor demonstrates that it causes additional costs to customers during at least 20 years, compared to the baseline scenario.<sup>149</sup> Yet, Project costs and risks are entirely borne by the Distributor's customers and would absolutely not be offset by any direct advantage or benefit they may draw from the Project.<sup>150</sup>

[182] UC is also of the opinion that the Distributor's evidence does not prove a rate of CNG deployment over 5 years is the optimal solution. The Distributor showed no deployment scenario over a different period. According to this Stakeholder, it would have been more appropriate to review a scenario which minimises the costs for write-off and for accelerated depreciation of assets, as well as the costs for relocation and for early retirement in eliminated jobs.<sup>151</sup>

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<sup>147</sup> Exhibit C-UC-0045, page 5.

<sup>148</sup> Exhibit C-UC-0045, page 35.

<sup>149</sup> Exhibit C-UC-0045, page 36.

<sup>150</sup> Exhibit C-UC-0045, page 37.

<sup>151</sup> Exhibit C-UC-0045, page 36.

[183] According to UC, the Distributor's customers should not be responsible for removal and accelerated depreciation of equipment which did not reach the end of its life.<sup>152</sup>

[184] Regarding the remote connection/disconnection feature, UC considers that cases where this feature would be used should be clearly identified; a frequent and thorough follow-up of changes in the annual number of service disconnections, of the number of payment plans negotiated, and of accounts receivable should be performed.<sup>153</sup>

[185] In addition, UC submits that the Distributor must clearly inform its customers that data it collects about their consumption will only be used for billing purposes and managing the electrical network. According to this Stakeholder, the Distributor may not without a customer's express consent uses for other purposes any data collected, in accordance with Sections 35-40 of Quebec's Civil Code.<sup>154</sup>

[186] In conclusion, UC considers that the Board should not approve the Project as submitted by the Distributor, especially since it would not be economically beneficial and because the Distributor failed to consider full replacement of CNGs at the end of their useful life.<sup>155</sup>

## 5.11 UMQ.

[187] UMQ favours the technological change undertaken by the Distributor but questions the realism of anticipated savings, \$200 million approximately.

[188] This Stakeholder considers that "*massive implementation of smart meters is not a problem in itself; rather, the limited use made of available features that leave consumers without any real sufficient benefits from this technological shift.*"<sup>156</sup>

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<sup>152</sup> Exhibit C-UC-0045, page 38.

<sup>153</sup> Exhibit C-UC-0045, page 35.

<sup>154</sup> Exhibit C-UC-0045, page 37.

<sup>155</sup> Exhibit C-UC-0045, page 36.

<sup>156</sup> Exhibit C-UMQ-0044, page 2.

[189] UMQ notes that one third of a CNG's useful life over fifteen years will be reached before new features - most of them available at the early stages of the Project's massive deployment -, are operational with additional servicing costs and possibly, gains this could bring.<sup>157</sup>

[190] This Stakeholder submits that evidence presented by the Distributor is incomplete, whereas under Section 73 of the Act the Distributor must offer alternatives to the Project and not a comparative study involving a status quo scenario.<sup>158</sup>

[191] Nevertheless, UMQ conducted a thorough review of the Project's economic analysis by posing several hypotheses, namely, the calculation of residuals, the actual number of meters installed over a 20-year period, and the growth of subscribers during the life of Project.<sup>159</sup>

[192] According to UMQ, the Distributor allegedly undervalued by \$130.7 million the costs in the AMI scenario, and overestimated those by \$84.6 million in the baseline scenario. This Stakeholder submits that "*the significant price difference between AMI meters and electronic meters [...] will remain significant for a few more years, and such price difference will differently affect costs in the baseline scenario compared to the AMI scenario.*"<sup>160</sup> This results in a net unfavorable effect of \$46.1 million on the Project's economic rationale as presented by the Distributor.

[193] UMQ also believes that gains associated with the remote connection/disconnection feature should be specified in both scenarios since the Distributor mentioned that the costs to be charged for this feature are different from the costs of a physical service.<sup>161</sup>

[194] After analysing all evidence from the Distributor, UMQ concludes that the Project does not generate efficiency gains of approximately \$200 million, but rather results in an additional cost that is assessed between \$123 million and \$340,4 million. In such a context, this Stakeholder requests the project to include implementation of additional features causing real gains for customers in a very near future.

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<sup>157</sup> Exhibit C-UMQ-0044, page 2.

<sup>158</sup> Exhibit C-UMQ-0044, pages 3-10.

<sup>159</sup> Exhibit C-UMQ-0044, pages 11-16.

<sup>160</sup> Exhibit C-UMQ-0044, page 14.

<sup>161</sup> Exhibit C-UMQ-0044, pages 15 and 16.

[195] Should an authorisation be granted to the Project, UMQ requests that the Distributor reports on the Project progress, costs projection, materialisation of expected benefits and additional gains associated to introduction of new features being deployed, as suggested by Accenture.<sup>162</sup>

## 6. THE DISTRIBUTOR'S RESPONSE.

### 6.1 SCFP-FTQ.

[196] On documents filed by this Stakeholder who attempts to demonstrate that the Project is not socially accepted by the population<sup>163</sup>, the Distributor submits that the Board should not give weight to the survey results and signatures collected.<sup>164</sup>

[197] The Distributor submits that such survey was carried out following a campaign of misinformation and denigration about the Project undertaken by SCFP-FTQ, which was completed at the end of September 2011.<sup>165</sup>

[198] On this Stakeholder's economic analysis, the Distributor submits that it is not supported by evidence on file.

[199] The Distributor determines that:

*"The economic analysis presented by SCFP-FTQ borrowed data from the financial analysis and from the economic analysis conducted by HQD when those furthered SCFP-FTQ's cause; but other data were dismissed without reason when they did not further such cause. In fact, when cross-examined on reasons explaining such choices, the witness was unable to provide any valid explanation. In short, no rigorous and reliable analysis which would be supported by empirical data acquired over time was presented; and HQD submits that no credibility may be granted to this economic analysis."*<sup>166</sup>

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<sup>162</sup> Exhibit C-UMQ-0044, page 7.

<sup>163</sup> Exhibit C-SCFP-FTQ-0013.

<sup>164</sup> Exhibit B-0163, page 43.

<sup>165</sup> Exhibit B-0163, pages 43 and 44.

<sup>166</sup> Exhibit B-0163, page 45.

## 6.2 ROÉÉ.

[200] On evidence from Mr. Bertsch, the expert mandated by ROÉÉ, the Distributor considers that *"the views expressed by M Bertsch are quite beyond the analysis limitations the Board must perform. For all practical purposes, Mr. Bertsch in fact compared the AMI project implemented by BCHydro with the Distributor's project, to finally suggest that additional features be implemented."* <sup>167</sup>

[201] The Distributor reminds all participants that the Project it submits has a well-defined scope which differs from the one expected by Mr. Bertsch, the expert, and it is not the latter's mandate to redesign its Project.

## 6.3 OC.

[202] According to the Distributor, evidence from this Stakeholder assumes a number of assumptions to justify some of the criticisms expressed, without this Stakeholder in any way whatsoever, attempting to verify the correctness thereof (e.g., price difference between an electronic meter and a CNG, the useful life of a meter used by HQD meter, and the rate of employee turnover). <sup>168</sup>

# 7. THE BOARD'S ANALYSIS AND OPINION.

## 7.1 PRELIMINARY OBSERVATIONS.

[203] The Project aims at modernising the Distributor's equipment and restructuring some of its operations. It is comparable to other projects of the same type implemented in Canada, in the United States and in Europe.

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<sup>167</sup> Exhibit B-0163, pages 45 and 46.

<sup>168</sup> Exhibit B-0163, page 46.

[204] However, for various reasons, the Project is poorly accepted by many Stakeholders and some Distributor's customers. It should be noted that the Project was the subject of negative advertising in the media, orchestrated by SCFP-FTQ, Hydro-Quebec's Employee Union. As a result of such advertising, the Board was swamped with emails from opponents to the Project.

[205] It is therefore important to analyse the Project not based on feelings or assumptions, but based on the preponderant evidence on file.

[206] In this context, it is appropriate to view the Distributor's initial approach.

[207] This approach is no different from other businesses' approach who, some day, reach a point where they must restructure and modernize their operations to be more efficient and cope with competition.

[208] In the case of this Project, investments and operating costs impact each other. The Distributor invests in modern equipment to reduce its operating expenses.

[209] Concretely, the Distributor's costs of labor, including fringe benefits (pension funds and other benefits), provide a significant part of operating expenses. These charges represent 25% of the Distributor's operating expenses.

[210] In analysing this type of restructuring project, which involves implementation of new technologies, the Board must balance public interest as well as consumers' and Distributor's interest.<sup>169</sup>

[211] In doing so, the Board may consider government policies that are part of the broader public interest concept. Government policies are well known by an economic regulation organisation such as the Board.

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<sup>169</sup> Section 5 of the Act.

[212] Inevitably, the Distributor's interest (HydroQuebec) and the public interest do meet. Hydro-Quebec is a State-owned company but also a business corporation, which, in the interest of its shareholder (the Government of Quebec), must be efficient and profitable.

[213] The Distributor's Project is in line with government guidelines in place at the time it was developed:

*"Quebec is on right track in terms of productivity. Progress has been made but we still must perform better. [...]"*

*New technologies, such as information technologies, are also a key factor in improving productivity. In recent years, use of digital technologies has experienced a most rapid growth. Several spheres of activity, including health and education, were affected by these innovations.*

*The performance of Quebec's economy and the competitiveness of its businesses cannot experience optimal growth if they do not take such new reality into account as well as infinite opportunities it offers. In Quebec however, existing infrastructure may likely no longer be able to provide the level and quality of service required in the next few years."* <sup>170</sup>

[214] In the following Sections, the Board will review evidence on file by essentially following the Regulation plan that prescribes information the Distributor must provide to the Board in order to approve a project. The Board will also review some aspects of the participants' evidence.

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<sup>170</sup> Excerpts from the Budget Speech, 2011-2012, page 26;  
<http://www.budget.finances.gouv.gc.ca/Budget/2011-2012/fr/documents/DiscoursBudget.pdf>

## 7.2 PROJECT DESCRIPTION.

[215] The project aims at replacing with CNGs the existing fleet of electromechanical and electronic meters.

[216] The replacement plan includes implementing an AMI infrastructure, massive deployment of CNGs, and implementing three features associated with the new meters: remote reading; remote connection/disconnection; and remote recording consumption patterns.

[217] Implementation of this plan is divided into three phases and is spread over the 2012-2018 period.

[218] Moreover, additional features could be implemented during the next few years, subject to the results of techno-economic analyses performed for such purpose.

[219] Phase 1 of the Project has a total expected cost of \$440.5 million and includes these items:  
<sup>171</sup>

- Carrying out preparatory work for a 24-month period;
- Implementing pilot projects;
- Acquiring and integrating to Hydro-Quebec's system of a data acquisition node and of a measurement data management system;
- Launching calls for bids for the acquisition and installation of CNGs, collectors, routers and telecommunications services;
- Establishing IT for an AMI, including developing communication links with the service provider who is responsible for installing CNGs, developing the remote connection/disconnection feature, and establishing an operating centre for measurement before deployment of the Project's CNG;

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<sup>171</sup> Exhibit B-0002, pages 3 and 4.

- Replacing 1.7 million meters in the Greater Montreal (Montreal Island, Laval, northern municipalities and part of southern municipalities), and the acquisition and installation of routers and collectors required throughout the 2012-2013 period, but to be phased in until the first half of 2014.

### **7.3 PROJECT JUSTIFICATION AND OBJECTIVES.**

[220] The Project aims at (i) ensuring sustainability of the meter fleet; (ii) performing efficiency gains in the Distributor's operations; and (iii) providing customers new services and a more efficient distribution network.

[221] As noted in its D-2011-124 Decision, the Board must consider whether these objectives are justified and necessary to the electricity distribution service.

#### **7.3.1 ENSURING SUSTAINABILITY OF THE METER FLEET.**

[222] Aging of the meter fleet is a key factor to consider while analysing the Project. Measuring and accurate billing of electricity consumed by customers are two activities essential to the Distributor's operations.

[223] The current meter fleet consists of some three million electromechanical meters, and about 800,000 electronic meters. In 2011, such meter fleet's mean age was 22 years.

[224] Electronic meters have been installed for several years and have not yet reached their useful life, or 15 years. However, such is not the case for electromechanical meters, whose life expectancy is 25 years. Thus, in the Distributor's entire meter fleet, over 45% (1.7 million) electromechanical meters currently exceed their lifetime. By 2016, some 500,000 more meters will be added.

[225] The Distributor must ensure its meters meet Measurement Canada's measurement standards. However, Measurement Canada's new S-S-06 standard is already in force for electronic meters and will apply in 2014 to electromechanical meters. Its application to electromechanical meters will not only increase the meter sampling volume, but also reduce the allowable time period during which batches of electromechanical meters will be kept in service.

[226] The S-S-06 standard aims at achieving a confidence level such that 95% of batches in service do not have over 1% of meters outside the 3% legal limit deviation. To efficiently achieve such level of confidence, a much larger volume of samples must be collected from customers depending on the batch size. In addition to increasing the volume of meters to sample, the new standard also tightens acceptability criteria for sampling results. In addition, the extension length of the validity period for a Measurement Canada seal is regressive in time. Thus, a seals' validity duration will be extended for shorter and shorter periods of time. This change will limit the number of years during which a unit may be in operation.

### 7.3.2 EFFICIENCY GAINS.

[227] As mentioned above, annual expenses relating to payroll represent nearly 25% of the Distributor's distribution and customer service costs. Whereas pricing of the Distributor's services is based on the Distributor's cost of service, the elimination of 726 positions - 603 jobs as readers, 102 jobs related to disconnection/reconnections, 21 jobs as customer service representatives, reducing other costs (vehicles, fuel, etc.) -- is theoretically, a profitable approach for both the Distributor and customers.

[228] It is important to remember that the Board, in setting or modifying rates for electricity distribution, makes a judgment on the Distributor's need for expenses (operating expenses). To be included in the cost of the Distributor's service, expenditures should be considered necessary "*to cover the cost of providing the service*" within the meaning of Paragraph 2, Section 49 of the Act.

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<sup>172</sup> File R-3814-2012, Exhibit B-0024, page 5.

[229] Thus, insofar as AMI infrastructure and CNGs help automatically perform various activities at a lower cost, expenses related to old methods should normally not be considered as expenses required to deliver service.

[230] Evidence shows that the Distributor has currently a window of opportunity to reorganize its operations without creating significant drawbacks for its employees.

[231] Of the 726 jobs impacted by this work reorganization, 180 will be eliminated by already planned retirements, 270 temporary positions will not be renewed, and 96 will result from resignations within the regular staff turnover at the Distributor's.

[232] In fact, only 180 permanent employees will be relocated. In this regard, the Distributor planned to deploy such employees elsewhere within Hydro-Quebec since more than 2,150 positions must be filled by the end of the Project deployment.

[233] Thus, contrary to what was conveyed in the media and by SCFP-FTQ, evidence does not show that 1,000 employees will be out of work as a result of the Project deployment.

### **7.3.3 OFFER FOR NEW SERVICES.**

[234] The Project provides tangible benefits to customers as follows: (i) rapidly obtaining accurate information on failures, (ii) physical meter readers will no longer require access their property, and (iii) billing based on actual rather than estimated, consumption data.

[235] The advantage of billing based on the actual reading of data recorded by a CNG is not negligible. More than 50% of consumer complaints to the Board focus on electrical consumption and billing. Therefore, it is plausible that billing based on actual consumption reduces the number of such disputes to the benefit of the Distributor's customers.

[236] Several Stakeholders, including GRAME, RNCREQ, S.É./AQLPA and UMQ, submitted that the Project scope was too limited, and did not allow to use, in the short term, the many features offered by CNGs (e.g., consumption management, home network, etc.).

[237] One should remember that D-2011-124 Decision framed the debate and limited it to the Project assessment as presented by the Distributor:

*"[37] [...] With respect to the third objective, the Board intends to limit the debate to the possibility [Board's emphasis in D-2011-124 Decision] that the Project equipment - namely, next generation meters, IT and AMI - could evolve into new services to customers and new network management measures.*

*[38] This being said, one should distinguish between (i) the possibility that technologies implemented by the Distributor in the Project could evolve to new features, and (ii) the economic analysis and authorisation of these other features for future projects.*

*[39] In this application, the Board is not reviewing future projects but this Project. Thus, a balance must be established between what needs to be discussed in Phase 1 and what can be discussed later. In this regard, the Board will need to consider the fact that this application concerns the first phase of a project designed in three phases and that some effects of the project first phase may later become ineluctable."* <sup>173</sup>

[238] In this respect, evidence shows that the technology introduced by the Project offers the potential of adding new features in due course.

[239] The Distributor explained the status of its implementation plan for a set of new features specific to CNGs and its timelines. Thus, starting in 2012, failure management and demand forecasts using consumption patterns should be implemented. Theft detection, consumption management through daily updates to customers' web pages, and measuring voltage at the meter (in conjunction with energy efficiency and the CATVAR project) should

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<sup>173</sup> D-2011-124 Decision, pages 11 and 12.

be available in 2013. Other features are subject to possible implementation between 2015 and 2017.<sup>174</sup>

[240] All in all, although the project is currently limited to a small number of features, the Board finds it meets the third objective mentioned above, that is, "the possibility that technologies implemented by the Distributor within the Project could evolve into new features." It is therefore a structuring project that is likely to be enhanced in the short term through the addition of new features to benefit the Distributor's customers.

#### **7.4 FEASIBILITY STUDY, AND ECONOMIC ANALYSES OF THE PROJECT.**

[241] The Distributor has developed two scenarios to explain the Project's economics:

- AMI scenario: A massive deployment of CNGs in three phases over a 5-year period (the Project);

- Baseline Scenario: A gradual replacement of the existing meter fleet by electronic meters over a 20-year period.

##### **7.4.1 THE AMI SCENARIO (THE PROJECT).**

[242] In this scenario, the Distributor will replace 3.8 million meters during the 2012-2017 period. The AMI infrastructure requires installation of a critical mass of CNG meters and telecommunication equipment (routers and collectors) to allow meshing of various system components.<sup>175</sup>

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<sup>174</sup> Exhibit B-0098, pages 15 and 16.

<sup>175</sup> Exhibit B-0006, page 29.

[243] Investments required for implementing AMI IT are planned in 2012. Those for purchasing and installing CNGs will be concentrated during the 2013-2017 period.

[244] The AMI scenario also provides that the Distributor must reinvest in 2018 and 2025 in IT and AMI equipment so as to take into account the useful life of such equipment.<sup>176</sup> Investments are also planned to replace approximately 28% of the meter fleet<sup>177</sup> between 2027 and 2031 at the end of validity period for seals of some CNG batches.

#### **7.4.2 THE BASELINE SCENARIO.**

[245] In this scenario, the Distributor would replace electromechanical meters with electronic meters over a 20-year period. The Distributor would first replace oldest electromechanical meters to gradually rejuvenate its meter fleet.

[246] In this scenario, due to the meter fleet aging, and the new S-S-06 standard from Measurement Canada, the Distributor would replace meters at a rate between 342,500 and 370,400 meters per year from 2012 to 2016. For subsequent years - from 2017 to 2031 - the replacement rate would slow down to 138,000 per year.<sup>178</sup>

[247] This scenario assumes that reading electronic meters would be performed manually. To this end, 600 employees equipped with MOMs would be required. For some commercial customers, meter reading could be performed remotely.<sup>179</sup>

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<sup>176</sup> Exhibit B-0006, pages 38 and 39.

<sup>177</sup> Exhibit B-0072, page 14.

<sup>178</sup> Exhibit B-0029, page 13.

<sup>179</sup> Exhibit B-0006, page 38.

### 7.4.3 THE FEASIBILITY STUDY.

[248] The Distributor set a number of parameters for its feasibility study. To this end, it used the results of benchmarking on similar projects and in particular on CNG and additional equipment lifetimes and rejection rates.

[249] Initial benchmarking indicates that regulatory bodies which were presented with similar projects generally agreed CNGs have a 15-year book value life. In addition, in its calls for bids, the Distributor required that bidders indicate the useful life of their equipment. At the end of the second call for bids, suppliers selected by the Distributor for meters acquisition stated that their CNGs for residential customers and for industrial and institutional customers have a technical lifetime of 20 years or more. Thus, the Distributor retained a 15-year book value life -- in line with the industry.<sup>180</sup>

[250] A second benchmarking indicates that meters are not systematically replaced at the end of the 15-year book value life. The replacement rate for CNGs would average 3.5% per year between the 15th and the 20th year, for an approximate total of 17.5% over 5 years.<sup>181</sup>

[251] Finally, based on experience gained in managing its meter fleet, the Distributor finds that the percentage of rejected electromechanical meter batches sampled during the last four years is 0.7% per year on average. Over a 5-year period, the total rejection ratio would fluctuate between 3.5 and 4%.

[252] The Distributor agrees that it is difficult to draw a conclusion which applies to CNGs by using past experience with electromechanical meters which were subject to Measurement Canada's old standard.<sup>182</sup> However, the current meter fleet age, as well as the application of the new S-S-06 standard, result in increasing the rejection potential of large batches of meters.<sup>183</sup> This situation explains

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<sup>180</sup> Exhibit B-0016, Question 1.2, page 4.

<sup>181</sup> Exhibit B-0072, page 14; and Exhibit B-0110, page 4, Table E-15.

<sup>182</sup> Exhibit B-0072, page 15.

<sup>183</sup> Exhibit B-0072, page 12.

the accelerating number of meters replaced during the first five years in the baseline scenario.

[253] Based on these benchmarking results, for the feasibility study, the Distributor therefore uses a 15-year book value lifetime, combined with a 20-year useful life and a rejection rate approximately seven times higher (28%) than the average rejection rate observed previously, to reflect risks associated with all new technologies.<sup>184</sup>

[254] Table 2 shows feasibility study results over a 20-year period.

**TABLE 2**

**ECONOMIC COMPARISON BETWEEN SCENARIOS (\$M, 2011 DISCOUNTED)**

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\$Million (2011 discounted)

Analysis period: 2011-2031

	IMA Scenario	Baseline Scenario	Variance
Investments	720.1	500.4	219.7
Operating expenses	365.3	871.8	(506.5)
Tax on utilities	1.5	-	1.5
Residual values	(85.6)	(81.2)	(4.4)
<b>Total</b>	<b>1,001.3</b>	<b>1,291.0</b>	<b>(289.7)</b>

\* Excluding IT infrastructure

Source: Exhibit B-0006, page 39, Table 7

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[255] The AMI scenario (the Project) has a discounted cost of \$289.7 million below that of the baseline scenario over a 20-year period, excluding the \$87.8 million investment required for the implementing the AMI's infrastructure IT.<sup>185</sup>

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<sup>184</sup> Exhibit B-0072, page 15.

<sup>185</sup> Exhibit B-0006, pages 39 and 40.

#### 7.4.4 RESULTS OF ECONOMIC ANALYSES.

[256] In order to test the robustness of the feasibility study results and to demonstrate the AMI solution's advantage, the Distributor performed three other economic analyses to meet the Board's, and some Stakeholders', demands. The following table shows results obtained in 2011 discounted dollars from the various economic analyses requested.

**TABLE 3**  
**RESULTS OF VARIOUS ECONOMIC ANALYSES**

Million \$ (2011 discounted), 2011- 2031 analysis period unless otherwise stated					
	Infrastructure IT	IMA scenario	Baseline scenario	Savings baseline-IMA	VAN
	(1)	(2)	(3)	(4) = (3)-(2)	(5)=(1)+(4)
Distributor's economic analysis over a 20-year period <sup>1</sup>	(87.8)	1,001.3	1,291	289.7	201.9
Distributor's economic analysis over a 15-year period <sup>2</sup>	(87.8)	973.2	1,189.6	216.4	128.6
Hypothetical scenarios					
Replacing new generation meters, routers and collectors in AMI scenario after 15 years <sup>3</sup>	(87.8)	1,046.4	1,291.0	244.6	156.8
Uniform replacement of existing meters with electronic meters in the baseline scenario	(87.8)	1,001.3	1,222.5	221.2	133.4

Notes:

- (1) Analysis performed at OC's request (question 4.1 from OC, Exhibit HQD-4, Document 6.1)
- (2) Analysis performed at UC's request (question 21.1 from UC, Exhibit HQD-4, Document 11.1)
- (3): Hypothetical scenario produced at FCEI's request (question 1.10 from FCEI, Exhibit HQD-4, Document 4.1)

Source: Exhibit B-0072, page 16, Table 5

##### 7.4.4.1 Economic analysis including IT investments

[257] The first analysis uses data from the feasibility study, this time including costs related to IT implementation. The Project's efficiency gains are estimated at \$201.9 million over 20 years.

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<sup>186</sup> Exhibit B-0072, pages 15-21.

**7.4.4.2**      *Economic analysis over a 15-year period.*

[258] For this analysis, the Distributor made the following assumptions:

- For the AMI scenario, no CNG replacement at the end of their book value life;
- For the baseline scenario, replacement of the entire meter fleet over 15 years instead of 20 years, while maintaining the same replacement pace during the first five years as mentioned in the economic analysis.

[259] This economic analysis results in a restriction of gains associated with the Project deployment. Only gains from the first massive deployment year are fully credited in the 15-year analysis. Nevertheless, the result shows that the AMI scenario remains attractive compared to the baseline scenario, a benefit valued at \$128.6 million over 15 years, including IT investments.

**7.4.4.3**      *Economic analysis incorporating replacement of CNGs and of additional equipment after 15 years for AMI scenario.*

[260] This analysis is based on replacing, in the AMI scenario, all GNGs, collectors and routers installed after 15 years (between 2027 and 2031).

[261] The Distributor transposed the purchase and installation costs for equipment implemented during the 2012-2017 period to the 2027-2031 period, according to the following assumptions:

- Cost increased for installing various equipment, of 3% per year;
- Keeping acquisition cost of various at the 2012-2017 price level.

[262] This analysis results in a \$180 million increase in investment costs in the AMI scenario. However, since the analysis period is 20 years, replacing various equipment, CNGs in particular, results in a \$135 million increase in their residual value. The result is a \$45 million net increase in discounted value in the AMI scenario, compared to the AMI scenario from the original study.

[263] Under this analysis, the results obtained indicate that the AMI scenario remains advantageous, with net earnings of \$156.8 million over 20 years compared to the baseline scenario.

***7.4.4.4 Economic analysis integrating uniform annual replacement of current meters with electronic meters in the baseline scenario.***

[264] This analysis is based on a modified baseline scenario, where electromechanical meters would be replaced with electronic meters at a uniform replacement rate of 191,262 meters per year for 20 years.

[265] The result of this other analysis shows that, even assuming a uniform rate of replacement, the AMI scenario remains advantageous compared to the baseline scenario, with a \$133.4 million gain over 20 years.

**7.4.5 STAKEHOLDERS' POSITION ON THE DISTRIBUTOR'S ECONOMIC ANALYSIS.**

***7.4.5.1 IT cost for AMI Infrastructure.***

[266] FCEI, OC, SCFP-FTQ, UC and UMQ<sup>187</sup> submit that the Project economic analysis must include IT investments of \$87.8 million in the AMI scenario.

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<sup>187</sup> Exhibit C-FCEI-0032, page 12; Exhibit C-OC-0021, pages 5 and 6; Exhibit C-SCFP-FTQ-0011, pages 8-10; Exhibit C-UC-0045, page 21; and Exhibit C-UMQ-0044, Summary Table, page 12.

**7.4.5.2**      *Volume of meters.*

[267] FCEI, SCFP-FTQ, UC, and UMQ challenge assumptions regarding volume of meters in both Distributor's scenarios.

[268] FCEI and UMQ find that the number of CNG replacements in the AMI scenario is significantly undervalued <sup>188</sup>. For these Stakeholders, the Distributor did not demonstrate that the 28% replacement rate between 2027 and 2031 is sufficient to meet the replacement needs over the period covered by the analysis.

[269] On the one hand, these Stakeholders underline that this replacement rate is established in reference to a rejection rate of electromechanical meters; whereas the AMI scenario focuses exclusively on electronic meters.

[270] Also, in their view, the Distributor bases its findings on a benchmark the results which relate to electronic meters rather than AMI meters.

[271] Finally, these Stakeholders underline that it is not sufficient to mention that such meter replacements are included in the Distributor's regular maintenance activities and therefore exclude them from the Project's economic justification.

[272] These Stakeholders consider that the Distributor may not determine the CNG replacement rate without taking into account the fact that the meters will need replacement before the end of their book value life and even during the first few years in some cases. <sup>189</sup>

[273] Referring to results from the Distributor's benchmark, FCEI and UMQ believe the AMI scenario must take into account costs related to replacing rejected CNGs, not only as a result of sampling but also of calibration and corrective maintenance.

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<sup>188</sup> Exhibit C-FCEI-0032, pages 13-16; and Exhibit C-UMQ-0031, pages 9-14.

<sup>189</sup> Exhibit C-FCEI-0032, pages 12-14; and Exhibit C-UMQ-0031, pages 13 and 14.

[274] These Stakeholders suggest that the AMI scenario should include costs that would reflect a progressive annual replacement rate of 1% to 4.75% for the duration economic analyses. According to these Stakeholders, this progressive rate would take into account both the replacement rate of defective meters, and the replacement of meters at the end of their useful life.<sup>190</sup>

[275] With FCEI's support, UMQ submits that adding all these factors to the AMI scenario and increasing the meter fleet, would increase the CNG volume to 5.6 million. The replacement rate the Distributor should have used in its AMI scenario would be just over 50% over 20 years. Therefore, the Project costs should be adjusted and be increased accordingly.<sup>191</sup>

[276] SCFP-FTQ also considers that the meter replacement volume as presented by the Distributor is insufficient within the AMI scenario. Since the CNG lifetime is 15 years, this Stakeholder submits that all meters installed during the deployment period should be replaced between 2027 and 2031. Considering a 100 % replacement rate, the AMI scenario should then include 7.4 million meters. The Project cost would therefore be higher than the cost indicated by the Distributor.<sup>192</sup>

[277] UC submits that the Distributor does not appropriately justify its assumption that the Distributor should replace only 28% CNGs which reached the end of their useful life. According to this Stakeholder, the Distributor would just spread CNG replacement over several years, so as to reduce the impact of a massive replacement of meters at the end of their useful life. Thus, UC is of the opinion that the AMI scenario should include a prompt replacement of meters during the first sampling, and all CNGs at the end of their useful life.<sup>193</sup>

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<sup>190</sup> Exhibit C-FCEI-0032, pages 12-14; and Exhibit C-UMQ-0031, pages 16 and 17.

<sup>191</sup> Exhibit C-FCEI-0032, pages 12-14; and Exhibit C-UMQ-0031, pages 18-20.

<sup>192</sup> Exhibit C-SCFP-FTQ-0011, pages 18 and 19.

<sup>193</sup> Exhibit C-UC-0045, page 22.

[278] As to the baseline scenario, FCEI and UMQ consider this scenario should take into account the impact that Measurement Canada's new S-S-06 Standard will have on the lifetime of existing meters. By imposing a progressive decrease of the extended period of the seal during sampling and renewing meter batches, these Stakeholders consider that this standard results in reducing the lifetime thereof. These Stakeholders suggest this fact should be taken into account by applying a 20% decrease to the meters' book value lifetime. FCEI also suggest an additional \$20 million adjustment to UMQ's results in this regard.

[279] On its part, SCFP-FTQ considers that the Distributor has not demonstrated in the baseline scenario that a higher number of electromechanical meters should necessarily be replaced during the first five years. In its opinion, the Distributor artificially increased the number of meters to be replaced. On the contrary, the average number of meters to be replaced annually should be the same over the period studied.

[280] In addition, to reflect the 15-year lifetime of electronic meters, SCFP-FTQ believes that the average yearly number of meters to be replaced should be double for each year of the five last years in the baseline scenario. The volume in this scenario would then be 4.8 million meters rather than 3.8 million as the Distributor alleges.<sup>194</sup>

#### **7.4.5.3 Growth of the meter fleet.**

[281] Both FCEI and UMQ submit the various scenarios must plan for growth of the meter fleet, explained by connecting new subscribers.<sup>195</sup>

[282] To reflect this reality, UMQ integrates to its economic analysis 50,000 new subscribers per year over the analysis period, for both the AMI scenario and baseline scenario. According to this Stakeholder, any addition of meters would require an expansion of the telecommunication network, and hence, costs connected thereto.<sup>196</sup>

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<sup>194</sup> Exhibit C-SCFP-FTQ-0011, pages 16 and 17.

<sup>195</sup> Exhibit C-FCEI-0032, pages 17 and 18; and Exhibit C-UMQ-0031, pages 27-30.

<sup>196</sup> Exhibit C-UMQ-0031, page 29.

[283] Both FCEI and UMQ emphasize it is important to consider the growth of the customer base in economic analyses, particularly since the price of equipment is different for both technologies (AMI meters and electronic meters); this should lead to different results in both scenarios.<sup>197</sup>

[284] Thus, taking into account a \$50 approximate variance between the unit price of AMI meters and the unit price of electronic meters, the discounted cost differential between the two scenarios is due to the integration of natural growth of the customer base over the period covered by the analysis; it would favour the baseline scenario and induce a \$46 million net unfavorable impact on the Project economic analysis, as presented by the Distributor.<sup>198</sup>

[285] OC supports UMQ's analysis in this regard. It considers that the customer base growth is crucial in order to analyse the project economics since increasing costs in both economic scenarios would not necessarily be linear for each new electrical installation.<sup>199</sup>

#### **7.4.5.4 Temporary replacement of meters.**

[286] The Distributor submits that electronic meters which are still functional, but to be replaced during the massive CNG deployment in the Project's Phase 1, will be used to temporarily replace electromechanical meters at the end of their useful life, and which are located in areas targeted by the Project's Phases 2 & 3. The Distributor intends to absorb the costs of these replacements in the framework of its activities.

[287] FCEI, UC and UMQ consider that these costs should be included in the Project economic analysis. The Stakeholders note that the Distributor assesses 200,000 meters are still valid and can be used again. The Stakeholders believe costs associated with temporary meter replacements would have a negative impact on the Project economic analysis, ranging between \$25 million and \$123.5 million.<sup>200</sup>

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<sup>197</sup> Exhibit C-FCEI-0032, pages 16 and 17; and Exhibit C-UMQ-0031, pages 29 and 30.

<sup>198</sup> Exhibit C-FCEI-0032, page 18; and Exhibit C-UMQ-0044, pages 13 and 14.

<sup>199</sup> Exhibit C-OC-0021, page 8.

<sup>200</sup> Exhibit C-FCEI-0032, pages 18-21; Exhibit C-UC-0045, page 23; and Exhibit C-UMQ-0031, pages 31-33.

#### 7.4.5.5 *Calculating of efficiency gains in AMI scenarios and baseline scenario.*

[288] RNCREQ estimates that the baseline scenario as presented by the Distributor, shows gaps and omissions that understate gains.

[289] For this Stakeholder, the Distributor assumption that payroll costs would increase by 3% per year for the next 20 years is not credible. According to this Stakeholder, electronic meter reading by MOMs or in "drive-by" mode would induce productivity gains in the number of readings a physical reader can perform on an hourly basis.<sup>201</sup>

[290] RNCREQ estimates the cost of electronic meter installation is too high. According to this Stakeholder, the Distributor uses a cost that is more akin to a per-unit rate than to a wholesale rate. Thus, with a price connected to a massive deployment, the cost of implementing electronic meters would in its opinion be significantly lower than the cost mentioned in the baseline scenario. This results in overestimating gains exclusive to the AMI scenario.<sup>202</sup>

[291] SCFP-FTQ considers the Project's efficiency gains have been overestimated by including cost savings, and some revenue in the AMI scenario. For this Stakeholder, the cost of labour in call centers and the cost for collection services are already included in the baseline scenario. These costs should have been included in the AMI scenario in order to measure the Project's efficiency gains. According to this Stakeholder, such omission would double the Project's efficiency gains.<sup>203</sup>

[292] FCEI and UMQ submit that the baseline scenario does not adequately reflect the efficiency potential from using the automated input mode of electronic meter reading data using MOMs.<sup>204</sup>

[293] UMQ suggests that based on installation of electronic meters, the baseline scenario should be increased by taking into account 40% efficiency gains connected to using MOMs.<sup>205</sup>

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<sup>201</sup> Exhibit C-RNCREQ-0027, pages 25 and 26.

<sup>202</sup> Exhibit C-RNCREQ-0049, page 8.

<sup>203</sup> Exhibit C-SCFP-FTQ-0044, page 20.

<sup>204</sup> Exhibit C-FCEI-0032, pages 19 and 21; and Exhibit C-UMQ-0044, pages 33 and 42.

<sup>205</sup> Exhibit C-UMQ-0044, page 38.

[294] In FCEI's opinion, the efficiency factor as proposed by UMQ is even too conservative. The efficiency potential the baseline scenario should have reflected by widening use of MOMs is assessed at \$85 million whereas FCEI assesses it at \$115 million.<sup>206</sup>

**7.4.5.6 Summary of Stakeholders' positions on the Distributor's economic analyses.**

[295] FCEI considers that as presented by the Distributor, the Project is not profitable and generates costs which are higher than the baseline scenario, in the approximate amount of \$51 million to \$150 million.

[296] SCFP-FTQ believes that by including in the AMI scenario the cost of IT, the replacement of all CNGs at the end of their useful life, and the elimination of reductions in costs and revenue from the economic analysis, the Project shows no gain compared to baseline scenario, but rather \$104.4 million losses.

[297] UMQ believes that the impact of all factors mentioned above about the Project's economic analysis means that "*we are not talking about \$200 million gains, but rather about additional costs to be borne by customers in the approximate amount of \$123.9 million to 360.4 million.*"<sup>207</sup>

**7.4.6 DISTRIBUTOR'S RESPONSE TO STAKEHOLDERS' POSITIONS ON ECONOMIC ANALYSES.**

[298] The Distributor considers as reasonable its assumption that the CNG price will follow a downward trend in the coming years and the price of electronic meters will increase due to a decrease in supply for this type of equipment.

[299] In addition, the Distributor believes UMQ's assumptions about the replacement rate of meters in the baseline scenario are not appropriate.

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<sup>206</sup> Exhibit C-FCEI-0032, pages 20 and 21.

<sup>207</sup> Exhibit C-UMQ-0044, page 17.

[300] The Distributor notes those in recent years, it voluntarily reduced its meter replacement activities. In doing so, historical data used by UMQ undervalue the number of required replacements over the next five years. In addition, management of steadily decreasing meter batches and the application of Measurement Canada's new S-S-06 Standard will result in a higher replacement rate. As a result, replacement rates used by UMQ do not reflect the actual situation in the coming years.<sup>208</sup>

[301] As to the Stakeholders' assumptions regarding the growth of the meter fleet due to new subscriptions, the Distributor believes that including such a factor in economic analyses would be a source of inaccuracy due to multiple assumptions that could be developed about the long-term annual growth in the number of subscriptions.

[302] The Distributor explains it preferred focussing on replacing the existing fleet. The Distributor notes that a review of meter fleet growth is performed within the submission of budgets which are related to its core activities during the annual rate review.<sup>209</sup>

[303] Furthermore, the Distributor does not accept results from analyses performed by the various Stakeholders on the temporary meter replacement and the volume variance between the two scenarios.

[304] The Distributor submits that an application for temporary relief will be filed with Measurement Canada and this will result in reducing a significant part of meter replacement costs during the Project deployment.<sup>210</sup> Also, CNG installation as part of its normal operations some time before implementation IT for AMI infrastructure, was integrated into its core business<sup>211</sup> In so doing, the Distributor can prevent unnecessary replacement of meters during the Project deployment.

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<sup>208</sup> Exhibit B-0166, page 6.

<sup>209</sup> Exhibit B-0166, page 8.

<sup>210</sup> Exhibit B-O 166, page 9.

<sup>211</sup> Exhibit A-0155, pages 195 and 196.

[305] With respect to efficiency gains which are specific to the baseline scenario, the Distributor submits that such gains may not result from applying a simple linear extrapolation. The Distributor explains that several components of reading costs do not vary according to the time required for meter reading.

[306] In addition, the Distributor underlines that its experience in meter reading leads it to believe that efficiency gains specific to the baseline scenario, specifically suggested by UMQ, would be marginal.<sup>212</sup>

[307] Costs inherent to a redesign of routes, to the number of sites, to various topologies (rural, semi-urban, urban), to meeting collective agreements, to computer equipment (MOMs, telecommunication and vehicles), and to the conversion speed of the meter fleet, may be just as significant as gains expected in the reading activity.<sup>213</sup>

[308] Finally, with respect to integrating cost reductions and revenue into the AMI scenario, the Distributor underlines that both scenarios include all common costs, such as installation and acquisition of meters, telecommunication and meter reading. However, some gains result from the Project deployment in the form of a cost decrease in the collection, call centers, and retrofitting functions. These gains do not concern the baseline scenario and are thus added only to the AMI scenario.

[309] The Distributor specifies that instead of inflating both scenarios with all possible costs for affected functions, he "*considered it more important to treat as marginal any items which would be critical in one scenario compared to another, and that is why in the AMI, [it] credited all gains that are inherent to activities other than reading; that is to say, gains that are inherent to the call centre, to collection agents, and to retrofitting.*"<sup>214</sup>

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<sup>212</sup> Exhibit B-0166, page 9.

<sup>213</sup> Exhibit B-0163, page 29.

<sup>214</sup> Exhibit A-0120, page 235.

**7.4.7 THE BOARD'S OPINION ON ECONOMIC ANALYSES.**

[310] The Project execution will inevitably require implementing IT simultaneously with CNG deployment. Economic analyses must therefore reflect the Project total costs, including IT costs, which are intrinsic to the Project.

[311] From the economic analysis, the Board notes that the Project will generate efficiency gains in the range of \$201.9 million, in 2011 discounted dollars.

[312] As to the renewal of IT investment and telecommunication equipment, the Board believes that the reinvestment frequency used by the Distributor in the analyses reflects a useful life based on reasonable expectations.

[313] On the meter volume, the Board notes that the Project is part of a context where there is no detailed history that explicitly deals on implementation and long-term management of a CNG fleet by a power Distributor. The Board notes that when faced with this problem, the Distributor built the AMI scenario by using various sources of information and the benchmark results from other companies' experience with meter fleets that are similar to the Project's.

[314] Considering current knowledge, the Board is satisfied with the Distributor's evidence and with conclusions from the Distributor's economic analyses.

[315] In addition, the Board considers that the Project economic analyses do not have to include activities that are part of the Distributor's regular business process.

[316] Thus, replacement of defective meters or of meters that do not meet the quality standards is part of the Distributor's ongoing activities while managing of its equipment's reliability. The Board considers that the economic analyses did not have to reflect factors that regard the Distributor's current activities or result from factors external to the Project.

[317] Managing infrastructure quality is a common activity which belongs to both scenarios. In addition, it does not create any significant differential for the purpose of economic analyses.

[318] Even assuming that any meter fleet growth due to new subscriptions may impact on the Project's economic analysis due to the difference between the unit price of an electronic meter and the unit price of a CNG (UMQ mentions a \$46 million impact), the Board finds that the Project continues to generate efficiency gains greater than those in the baseline scenario.

[319] The Board is aware of the fact that various productivity factors could have been included in the baseline scenario. In this case, the Distributor limited itself to implementation of MOM reading technology and did not change its settings pertaining to reading of electronic meters.

[320] In this regard, several Stakeholders believe that implementation of MOM reading technology would improve this activity productivity and that more efficiency gains should have been reflected in the baseline scenario.

[321] However, the Board believes that assumptions made by the Stakeholders not only generate gains but also costs, evidence of which they did not bring. Therefore, the Board finds that such Stakeholders' evidence is incomplete in this respect.

[322] As regards the unit price of electronic meters in the baseline scenario, the Board considers there is no evidence which could reasonably lead the Board to assume prevailing market conditions, or that the unit price of these meters would be lower if the Distributor made a massive purchase of electronic meters since, everywhere else, CNGs dominate the market.

[323] In addition, the Board considers it reasonable to marginally treat gains from collection activities, from customer service, and from retrofitting to compare both scenarios. This avoids inflating costs of both scenarios in connection with corresponding activities. Indeed, in addition to efficiency gains from eliminating reading costs, CNG implementation induces efficiency gains from a larger automation of collection, customer service, and retrofitting activities. Since the business process remains unchanged, such efficiency gains are not taken into account in the baseline scenario. In this context, it is therefore appropriate to include in the AMI scenario the impact on the gain margin related to the technology change in downstream meter reading activities.

[324] Finally, the Board believes that the three scenarios assessed as part of the Project's economic analysis validate the robustness of results initially achieved by the Distributor in the framework of its Project feasibility analysis.

## **7.5 PROJECT'S SENSITIVITY ANALYSES.**

[325] To test the results of its feasibility study, the Distributor completed two sensitivity analyses:<sup>215</sup>

- Increased relocation costs: The Distributor assumes that relocating employees will be more difficult than expected and will require paying two years of wages per employee. Relocation costs would then increase by \$25 million (discounted). This analysis shows the Distributor still maintains significant flexibility to achieve the Project;

- Increased investment costs: The Distributor varies investment costs until they cancel the expected cost reduction between the baseline scenario and the AMI scenario. Since 82% of project costs are set by contract, results of this sensitivity analysis show that Project variable costs should increase by 54% so that costs from both scenarios are equivalent.

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<sup>215</sup> Exhibit B-0006, page 41.

[326] Pilot projects enabled the Distributor to validate various parameters for costs which are not set by agreements, such as the time required to obtain field surveys required for establishing the network topology and time for its teams to install meters, routers, and collectors.<sup>216</sup>

[327] UMQ submits that although some Project costs are set by agreements, it is possible that they may increase by about 20%. Based on results from the Villeray pilot project, this Stakeholder submits that the planned pace of CNG deployment may not be achievable, and that an increase in installation costs is probable.

[328] The Board believes that results from pilot projects did validate a set of critical parameters, in particular those related to the deployment rate and to the AMI equipment interoperability.

[329] In addition, the Board considers the following facts provide reasonable assurance that the Project can be carried out within the budget: (i) CNSGs will be provided at a determined price, (ii) telecommunication services are offered by a large company under terms set by agreements, and (iii) outsourcing of a significant portion of meter installation operations is at a set cost.

[330] In this regard, the Board may also refer to the opinion of Mr. Edmund P. Finamore, GRAME's expert, who underlines that capital costs for this Project overall fall within the average cost of similar projects in North America. Indeed, according to the expert, based on estimated costs of projects, the projected average cost by can be reasonably compared with the cost assessed within other projects of the same type, although it is "*on the high end of the pricing spectrum.*"<sup>217</sup>

[331] Consequently, even if the project is not devoid of risk, evidence submitted to the Board suggests that the Project budget is comparable to what was done elsewhere, and even high ("*on the high end of the pricing spectrum*"). In the next Section, the Board will nevertheless address the Project's unforeseen developments and risks.

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<sup>216</sup> Exhibit B-0088, page 38; Exhibit A-0118, pages 189-191; and Exhibit A-0152, pages 77-87.

<sup>217</sup> Exhibit C-GRAME-0045, page 59.

## 7.6 COSTS AND FINANCIAL RISKS ASSOCIATED WITH THE PROJECT.

### 7.6.1 POTENTIAL OVERRUN OF PROJECTED COSTS.

[332] Due to its magnitude and duration, the Project obviously comes with a certain level of overrun risk of projected costs. The Distributor does acknowledge this fact, but submits it took mitigation action to minimise this risk.

[333] Evidence indicates that costs for purchasing and installing CNGs are guaranteed by agreements and subject to performance indicators.<sup>218</sup> Evidence also shows that routers, collectors, MDMS and the acquisition node also benefit from firm negotiated prices which are guaranteed by agreements.<sup>219</sup>

[334] Thus, 74% of total project costs are firm and set by agreements.<sup>220</sup>

[335] Excluding components and services from internal suppliers (8% of total cost), 18% of the Project costs are estimated and may vary. In this regard, the Distributor states that \$21.3 million and \$8.1 million contingencies were planned for investment and operating costs respectively.<sup>221</sup> From 2011 to 2019, the amounts of contingencies are distributed annually as follows:<sup>222</sup>

**TABLE 4**

#### PLANNED CONTINGENCY

<b>K\$ (current)</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018 +</b>	<b>Total</b>
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

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<sup>218</sup> Exhibit B-0006, page 43.

<sup>219</sup> Exhibit B-0098, page 11.

<sup>220</sup> Exhibit B-0026, page 25.

<sup>221</sup> Exhibit B-0006, page 36.

<sup>222</sup> Exhibit B-0016, page 27.

[336] The Distributor explains that contingencies are estimated based on risks which are associated with IT work and internal business operations, while taking into account its experience in IT and meter installation. The Distributor adds that the assumptions on the amounts of contingencies will be reassessed after the massive deployment starts and during the subsequent phases of the Project.<sup>223</sup>

[337] In this manner, the Distributor submits it applied due diligence, and greatly reduced the risk of potential cost overrun for the Project.<sup>224</sup> The Distributor highlights its utmost confidence in meeting budgets which were planned in its business plan. According to the Distributor, measures taken go beyond what it usually observed for this type of project.<sup>225</sup>

[338] In case if a cost overrun for the Project, and beyond planned contingencies, the Distributor submits its will show the Board required details so as to obtain an authorisation to recover, through rates, all additional costs that were not initially planned.<sup>226</sup>

[339] As stated above, several Stakeholders made proposals that the Board should cap the Project costs, and require the Distributor to assume any cost overrun beyond the Project budget.

[340] Thus, ACEFQ considers that any Project cost overrun should not be paid for by the Distributor's customer, but by the Distributor. In such a case, the Stakeholder submits that the Distributor should be held responsible, just like external suppliers doing business with the Distributor, who committed by agreements to meet firm prices for equipment and services.<sup>227</sup>

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<sup>223</sup> Exhibit B-0016, page 28; and Exhibit B-0039, page 10.

<sup>224</sup> Exhibit B-0163, page 25.

<sup>225</sup> Exhibit B-0039, page 9.

<sup>226</sup> Exhibit B-0163, page 26.

<sup>227</sup> Exhibit C-ACEFQ-0008, page 22.

[341] GRAME and Mr. Edmund P. Finamore, the expert, even though as mentioned above the latter considers that the Project budget favorably compares with what was done elsewhere, assess that the risks of cost overrun are real and significant, particularly in terms of telecommunication equipment and meter installation. Thus, Mr. Finamore suggests establishing a risk allocation process between the Distributor and its customers, so the Distributor will bear any cost overrun.

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[342] According to OC, the Distributor undervalues the risk of cost overrun. Referring to what it terms *the SIC project misfiring*<sup>229</sup>, this Stakeholder expressed the hope that the Board would impose a better distribution of any cost overrun risk between the Distributor and its customers.

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[341] RNCREQ submits that the Distributor's suggestion that customers, where appropriate, bear any cost overrun is not acceptable, since these risks are quite significant compared to expected gains.<sup>231</sup>

[344] SCFP-FTQ believes that the Distributor submits an incorrect assessment of cost overrun risk. Given the history of various projects by the Distributor in recent years, this Stakeholder believes that the Project budgeted contingencies are insufficient to cover potential cost overruns connected with a project of such magnitude.<sup>232</sup>

[345] Referring to the case of the SIC Solution, S.É./AQLPA suggests the Project approval should be accompanied by frequent and strict accountability reporting obligations, so the Board may adequately intervene in case of any changes or cost overruns.<sup>233</sup>

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<sup>228</sup> Exhibit C-GRAME-0045, page 75.

<sup>229</sup> Exhibit C-OC-0012, page 18.

<sup>230</sup> Exhibit A-0128, page 70.

<sup>231</sup> Exhibit C-RNCREQ-0029, pages 32 and 33; and Exhibit A-0135, pages 229 and 230.

<sup>232</sup> Exhibit A-O 128, pages 263-267.

<sup>233</sup> Exhibit C-S.É./AQLPA-0114, pages 11 and 12.

[346] UC submits that the Distributor must bear some risks from the Project, especially since the Distributor claims it minimised such risks to the best. In doing so, this Stakeholder recommends limiting customers' exposure to cost overrun risk to a determined level of contingencies, beyond which the Distributor would bear any excess costs over budgetary forecasts presented as evidence.<sup>235</sup>

[347] UMQ believes that the Distributor's customers are exposed to a significant cost overrun risk that could compromise the Project profitability.<sup>236</sup>

## 7.6.2 EFFICIENCY GAINS NOT REALISED.

[348] One of this Project's three main objectives is the realisation of efficiency gains in the meter reading, service disconnection, service reconnection, and customer billing aspects.<sup>237</sup>

[349] The Distributor plans on realising \$201.9 million discounted gains over 20 years by implementing the Project.<sup>238</sup> Recurring annual gains of \$81.0 million are thus planned from year 2018.<sup>239</sup>

**TABLE 5**

K\$ (current)	2012	2013	2014	2015	2016	2017	2018
Payroll	(103)	(8,234)	(19,933)	(36,214)	(42,057)	(42,682)	(62,493)
Other gains	(571)	(3,478)	(6,571)	(11,913)	(14,461)	(15,839)	(18,807)
<b>Total</b>	<b>(674)</b>	<b>(11,712)</b>	<b>(26,504)</b>	<b>(48,127)</b>	<b>(56,518)</b>	<b>(65,521)</b>	<b>(81,300)</b>

<sup>234</sup> Exhibit A-0130, pages 50-52.

<sup>235</sup> Exhibit C-UC-0022, page 16; and Exhibit C-UC-0045, page 35.

<sup>236</sup> Exhibit C-UMQ-0031, pages 3-5; and Exhibit C-UMQ-0034, pages 24 and 25.

<sup>237</sup> Exhibit B-0006, pages 7 and 8.

<sup>238</sup> Exhibit B-0072, page 16.

<sup>239</sup> Exhibit B-0006, page 37.

[350] These gains match the cost variance between the AMI scenario and the baseline scenario over a 20-year period (incremental gains)<sup>240</sup>. As for direct efficiency gains from implementing AMI, they would be \$124.4 million.<sup>241</sup>

**TABLE 6**

<b>Cost reduction and revenue, 2012-2031 period</b>	
<b>\$M, discounted</b>	
Remote Disconnection/Reconnection	(96.1)
Customer Service Actions	(17.4)
Retrofitting	(11.0)
<b>Total</b>	<b>(124.4)</b>

[351] The Distributor states it is confident it will realise these gains, because they originate from stopping specific activities and processes, "*and therefore their assessment is based on facts*"<sup>242</sup>. A Project Management Office was established and will be responsible for implementing and recording such efficiency gains.<sup>243</sup>

[352] Some Stakeholders expressed their skepticism towards the Project's ability to realise efficiency gains.

[353] ACEFQ considers that efficiency gains stated by the Distributor are the main criterion which justifies an authorisation for the Project.<sup>244</sup> However, this Stakeholder suggests that such gains could be lower than anticipated should additional labor needs become necessary.<sup>245</sup>

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<sup>240</sup> Exhibit B-0016, page 16.

<sup>241</sup> Exhibit B-0039, page 12.

<sup>242</sup> Exhibit B-0039, page 9.

<sup>243</sup> Exhibit B-0016, page 21.

<sup>244</sup> Exhibit C-ACEFQ-0008, page 4.

<sup>245</sup> Exhibit C-ACEFQ-0008, pages 9-11.

[354] FCEI believes that the anticipated efficiency gains could be realised later than expected by the Distributor; specifically, because risks pertaining to installation and deployment of meters are, according to this Stakeholder, poorly understood and poorly assessed.<sup>246</sup>

[355] GRAME and Mr. Edmund P. Finamore, its expert, conclude that the economic benefits from the Project are at risk, given the potential of an unknown number of customers who will exercise their Opt-out option.<sup>247</sup>

[356] In OC's opinion, it is crucially important to realise efficiency gains planned by the Distributor since such gains mitigate the upward pressure on rates caused by the Project's expenses and investments.<sup>248</sup> Yet, this Stakeholder questions the Distributor's calculation of unit gain by meter, and concludes it is overvalued. According to OC and contrary to the Distributor's claims, only monetary flows, and not the total number of meters installed, should be discounted. This Stakeholder thus finds a unit cost per meter of \$59.30, rather than \$73.70.<sup>249</sup>

[357] RNCREQ believes that the realisation of efficiency gains expected by the Distributor may possibly be compromised given the significance of risks that are inherent to this Project, specifically, those relating to cyber security and technological developments.<sup>250</sup>

[358] ROEE considers that the planned efficiency gains are at risk, given that case-by-case addition of additional features could generate extra costs associated with modifying already installed meters.<sup>251</sup>

[359] SCFP-FTQ suggests that expected efficiency gains may not be realised since the meter volume to be installed over a 20-year period is possibly undervalued.<sup>252</sup>

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<sup>246</sup> Exhibit C-FCEI-0032, pages 27 and 28.

<sup>247</sup> Exhibit C-GRAME-0078, page 36.

<sup>248</sup> Exhibit C-OC-0021, pages 2 and 3.

<sup>249</sup> Exhibit C-OC-0012, page 11.

<sup>250</sup> Exhibit C-RNCREQ-0049, pages 3, and 8-10.

<sup>251</sup> Exhibit C-ROEE-0028, page 27; and Exhibit C-ROEE-0087, pages 7-9.

<sup>252</sup> Exhibit C-SCFP-FTQ-0044, pages 17-19.

[360] UC suggests that risk relating to deployment, technological obsolescence and social acceptability may potentially compromise the realisation of anticipated efficiency gains.<sup>253</sup> This Stakeholder suggests that the Distributor's customers be kept harmless for any unrealised profit that would increase the projected costs for the Project.<sup>254</sup>

### **7.6.3 THE BOARD'S OPINION ON COSTS AND FINANCIAL RISK.**

[361] The Board considers that the Project is complex and certainly not devoid of risk, specifically in economic terms (higher costs than budgeted, deployment period longer than expected, difficult social acceptability, insufficient, or slow to materialize, profits, etc.).

[362] In this regard, the experience from the CIS solution commissioning shows costs can indeed be pushed through the roof,<sup>255</sup> despite a prior identification of potential risk, implementation of a credible mitigation plan, and project assessment by a third party.<sup>256</sup> Several Stakeholders recounted the experience with the SIC Solution.<sup>257</sup>

[363] However, the Board is satisfied with the Distributor's evidence, which among others suggests that the cost for purchasing and installing CNGs is guaranteed by agreements and subject to performance indicators, and that contingencies were planned for costs which are not guaranteed by agreements.

[364] As to the risk of not realising efficiency gains which form the basis of the Project economics, the Board notes that the Distributor established a Project Management Office, which will be responsible for realising and recording such gains. This will definitely simplify quarterly monitoring by the Board referred to in Section 7.10 of this Decision.

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<sup>253</sup> Exhibit A-0130, pages 50, and 61-52.

<sup>254</sup> Exhibit C-UC-0045, pages 37 and 38.

<sup>255</sup> File R-3644-2007, Exhibit B-1, HQD-13, Document 2, page 7.

<sup>256</sup> File R-3491-2002, Exhibit HQD-1, Document 1, pages 34 and 35.

<sup>257</sup> File R-3644-2007, Exhibit B-1, HQD-13, Document 2, page 7; File R-3491-2002, Exhibit HQD-1, Document 1, pages 34 and 35.

[365] As regards some Stakeholders' proposals to cap the Project costs and to decide under the Project authorisation under Section 73 of the Act, to charge the Distributor with any costs beyond those budgeted, the Board wishes to specify that the regulation does not work so.

[366] One should distinguish between a project authorisation under Section 73 of the Act and any later inclusion to the rate base of any Distributor service cost, actual investment costs or operating costs.

[367] A project is always authorised based on budgeted costs; in other words, based on projections. In the case of the Project, the economic is also based on efficiency gains projections, that is to say, on the actualisation of savings to be made later in the field of operating expenses.

[368] The Distributor will always be responsible for justifying its cost overrun when the Distributor wants them to be recognized as service cost when setting the Distributor's rates. When such situations arise, the Board must then determine whether these costs, even if budgeted, were nevertheless prudently incurred in this respect.<sup>258</sup>

[369] The same applies when efficiency gains were not realised, if applicable. As part of its rate application, the Distributor must explain why it should include to its service cost, some operating expenses that should be reduced but which could not be avoided for any reason. The Board will then do what it does for each rate year, namely, rule on the need for such charges.

## **7.7 IMPACT ON RATES AND REGULATORY TREATMENT.**

### **7.7.1 IMPACT ON RATES.**

[370] The Project deployment should be spread over the 2012-2017 period as shown in Table 7. Its impact on revenue required from the Distributor is calculated on the 2012-2031 period, a 20-year period from the scheduled start of Phase 1 for this Project.

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<sup>258</sup> Section 49 (2) of the Act.

**TABLE 7****IMPACT OF THE PROJECT ON RATES, BY IMPLEMENTATION YEAR****(IN K \$)**

in K\$

IMA scenario	2012	2013	2014	2015	2016	2017	2021	2015	2031
Charges	73,895	77,137	70,176	55,213	35,975	26,855	10,002	10,586	11,905
Depreciation	4,626	20,456	35,564	47,459	55,184	57,183	52,613	52,491	22,477
Tax on utilities	0	16	77	136	182	196	175	154	123
Financial fees	2,473	13,820	25,967	34,241	37,827	38,045	27,097	14,881	13,876
<b>A</b> Required revenue (excluding rates for write-offing)	<b>80,994</b>	<b>111,429</b>	<b>131,784</b>	<b>137,049</b>	<b>129,168</b>	<b>122,279</b>	<b>89,887</b>	<b>78,112</b>	<b>48,381</b>
<b>B</b> Required revenue - Baseline scenario	65,974	76,797	87,145	95,856	104,455	111,485	127,292	143,307	149,238
<b>C=A-B</b> Required revenue (differential between scenarios)	15,020	34,632	44,639	41,193	24,713	10,794	-37,405	-65,195	-100,857
<b>D</b> Depreciation and write-offing current devices	36,800	61,179	41,039	16,232	3,785	1,093	0	0	0
<b>E=C+D</b> Income required (differential)	51,820	95,811	85,678	57,425	28,498	11,887	-37,405	-65,195	-100,857

Source: Exhibit B-0006, page 42

[371] The Distributor's Project objectives include ensuring the sustainability of the meter fleet through accelerated replacement of meters which are currently in service. Therefore, it does not generate new revenue.

[372] The Project impact on distribution rates is "measured by the difference between the necessary required revenue under the baseline scenario, and the revenue necessary under the AMI scenario.

The financial analysis performed by the Distributor shows that the maximum differential impact on required revenue is \$95.8 million and will be effective in 2013 during deployment of Phase 1.

In itself, such impact reflects a 0.89% increase in distribution rates based on revenue required for year 2012 and as approved by the Board in its D-2012-035 Decision.<sup>259</sup>

[373] After 2018, the Project should exert downward pressure on prices due to efficiency gains originating from consumption reading automation and remote connection/disconnection.<sup>260</sup>

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<sup>259</sup> File R-3776-2011, page 10.

<sup>260</sup> Exhibits B-0007 and B-0163, page 32.

[374] The Project financial analysis takes into consideration the impact of accelerated depreciation and of write-off of 3.81 million electromechanical and electronic meters, which will be replaced during the project.

**TABLE 8**

**DEPRECIATION, WRITE-OFF, AND NUMBER OF DEVICES WRITTEN-OFF**

M\$	2012	2013	2014	2015	2016	2017	TOTAL
Depreciation of current devices	19.5	18.9	18.5	18.3	17.4	16.7	109.3
Additional depreciating	7.4	3.6	-5.3	-12.8	-13.6	-14.2	-34.9
Expenses for write-off of current devices	9.9	38.7	27.8	10.7	0.0	-1.4	87.5
	36.8	61.2	41.0	16.2	3.8	1.1	160.1
Number of devices written off	330,991	1,339,931	1,097,369	647,488	207,233	202,816	3,825,231

[375] Should the Project not go ahead, depreciation expenses from 2012 to 2017 for meters currently in service would be \$109.3 million.

[376] Under the Project, replacement of existing meters with CNGs forces the Distributor to review the lifetime of these devices. This results in accelerated depreciation expenses and write-off expenses of approximately \$50.8 million over the life of the Project. These expenses are based on the book value of meters in service, which was assessed at \$160.1 million as of December 31st, 2011.<sup>261</sup>

[377] UC submits that these accelerated depreciation charges are related to the Project deployment rate, which would not be optimal. According to this Stakeholder, the Distributor should have considered a scenario minimising any write-off costs and accelerated depreciation.

[378] Rather, the Board is of the view that spreading the Project deployment over time could modify efficiency gains, price agreements with suppliers, meshed network configuration, and would therefore have an impact on the Project which requires a certain density of CNG implementation.

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<sup>261</sup> Exhibit B-0016, page 30.

[379] With respect to accelerated depreciation expenses and write-off, from the moment the Board accepts the Project as submitted, their impact is inevitable and part of costs resulting from the Project.

#### 7.7.2 REGULATORY TREATMENT.

[380] Among other conclusions to its introductory application, the Distributor requires from the Board an authorisation "*to post to the differed expenses account (DEA) as created by D-2010-078 Decision, any 2012 costs related to the Remote Reading Project - Phase 1, in accordance with terms approved by the Board in D-2010-022 Decision.*"

[381] In this case, the Distributor submits that these costs total \$40,9 million and include 2012 expenses (\$35.0 million), as well as 2010 & 2011 expenses related to preparatory work (\$5.9 million).<sup>262</sup>

[382] In its D-2010-078 Decision, the Board agreed in principle to the creation of a DEA to register "*all costs related to the LAD Project preparatory work*"<sup>263</sup> without deciding on the relevance or recovery rate of these costs.

[383] As to D-2010-022 Decision<sup>264</sup>, it relates to the terms of DEAs applicable to \$10 million projects and authorised by the Board.

[384] Moreover, in its D-2012-024 Decision<sup>265</sup>, the Board accepted regulatory treatment of costs for projects above \$10 million and not authorised. Thus, whereas the decision on the Project was not rendered before the decision on the Distributor's 2012-2013 rate schedule, the Board requested the Distributor to remove the \$40.9 million Project impact from required revenue for 2012 test year, and register it into an off base DEA.

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<sup>262</sup> Exhibit B-0006, pages 47-50.

<sup>263</sup> D-2010-078 Decision, File R-3723-2010, pages 10 and 11.

<sup>264</sup> File R-3708-2009, page 47.

<sup>265</sup> File R-3776-2011, pages 40-44.

[385] The Board acknowledges that the Distributor will in 2012 incur costs relating to the Project and authorises the Distributor to register such into the already authorised DEA.

## **7.8 SOCIAL, ECONOMIC & ENVIRONMENTAL ISSUES.**

[386] The Project raised issues and even concerns among for several Stakeholders and customers, particularly since CNGs will emit RF fields. Effects on health from RF fields did raise the most questions.

[387] As appears from the following paragraphs, evidence clearly shows that there is no need to worry about the health effects of implementing CNGs. In this regard, the public needs to be properly educated.

[388] Some Stakeholders, specifically ACEFQ and S.É./AQLPA, consider there no consensus in the scientific community on the safety of RF fields radiated by CNGs. These Stakeholders are of the opinion that the precautionary principle must be applied, and some appropriate measures should be required from the Distributor, in particular when CNGs are installed inside lived-in space.

[389] SCFP-FTQ also raised concerns as to the social acceptability of the Project and submitted the results of a survey and a petition with more than 10,000 names of people opposed to the Project. To assess the probative value of such evidence, it is necessary to recall the context in which it was obtained. The Board will address this issue further.

[390] In the Sections that follow, the Board will clarify its jurisdiction and examine evidence on RF field radiations and their impact on public health. It will address social acceptability of the Project and rule on the issue of protecting data that were collected through AMI infrastructure.

### 7.8.1 THE BOARD'S JURISDICTION.

[391] The Board has no jurisdiction over broadcasting, RF or health. Other federal and provincial authorities have these jurisdictions.

[392] Without entering into some deep analysis of provisions in Section 5 of the Act<sup>266</sup>, but simply considering the broad sense of the *sustainable development* and *environment* concepts, the Board is justified in construing the phrase "satisfying energy needs in a sustainable development perspective" included in such Section as meaning, among other things, it may consider the social, economic, and environmental impact of its decisions. Without encroaching on the powers of other appropriate authorities, health effects may be considered as environmental effects.

[393] Thus, without being a body empowered to decide on medical controversies about the health effects of RF fields, the Board may nevertheless review evidence it received without prejudice<sup>267</sup> in this regard.

### 7.8.2 HEALTH IMPACT.

[394] The Board heard (i) technical evidence on the power of RF fields to which the public is exposed and the power of RF fields as particularly radiated by CNGs, and (ii) the opinion of a physician, specialising in the health impact of RF fields. The Board also took into account the views from MSSS, Health Canada and the World Health Organization (WHO) in this regard.

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<sup>266</sup> "5. In exercising its mandate, the Board reconciles public interest, consumer protection, and a fair treatment of the electricity carrier and Distributors. It endeavours to meet energy needs in a sustainable development perspective and equity, both for individuals and the community."

[Emphasis added by the Board].

<sup>267</sup> D-2012-046 Decision, page 5, paragraph 9.

### 7.8.2.1 *The power density of RF fields.*

[395] The Distributor's evidence <sup>268</sup> shows that within the 900 MHz frequency range (from 902 MHz to 928 MHz), the exposure limit of the "general public" established by Health Canada is a power density of 6 W/sq. meter (6,000,000 microwatts per square meter) for a six-minute exposure time, at a distance of more than 0.2 m from an electricity meter <sup>269</sup>.

[396] Smart meters emit RF fields in the 900 MHz frequency range at a power density well below the Health Canada's standard. Thus, evidence shows that at one meter away from the electricity meter, the power density is between 20,000 and 300,000 times below such standard.

<sup>270</sup>

[397] Evidence also shows in 1% of cases where the intensity of RF fields is highest - for example, when CNGs are located close to a collector -, radiations remain approximately 3,600 times below Health Canada's standard.

[398] One should note that regarding evidence on power densities observed on RF fields radiations from CNGs, the Distributor's measurements and those from Mr. Belainsky, the witness mandated by S.É./AQLPA, are consistent. Measurements from Mr Belainsky, the witness, are even lower than the Distributor's. <sup>271</sup>

[399] When measured at one meter away from the electricity meter, such values are about 50  $\mu$ W/sq. meter; 12.5  $\mu$ W/ sq. meter at two meters away from the electricity meter; 5.6  $\mu$ W/ sq. meter at three meters away from the electricity meter.

[400] The MSSS considers these values are very low compared to other sources of RF fields radiation <sup>272</sup>, especially when considering the average daily exposure to RF fields in our environment which is about 130  $\mu$ W/ sq. meter.

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<sup>268</sup> Exhibit B-0163, page 33; and Exhibit B-0098, page 21.

<sup>269</sup> Limits of human exposure to Radiofrequency electromagnetic fields in the frequency range from 3 kHz to 300 GHz, Safety Code 6 (2009), Health Canada, page 19, Table 6, entitled "Exposure limits for uncontrolled environments."

<sup>270</sup> Exhibit B-0045, page 12; Exhibit B-0085, page 1; and Exhibit A-0115, pages 65-68.

<sup>271</sup> Exhibit A-0115, pages 260 and 261. Questioned by H el ene Sicard on his thoughts about the Belainsky report, the Distributor's witness responded: "*For most measures presented, they are generally a little lower in terms of intensity to those measured by Mr. Robichaud's team.*"

<sup>272</sup> Exhibit D-0062, page 5.





[401] The Board also observes that in most homes, occupants are at a distance greater than 1 meter away from an electricity meter, since in most cases, the latter is located outside the homes. In addition, walls and CNG metal casings significantly soften waves radiated toward the inside of homes.<sup>273</sup>

[402] The Distributor submits that a CNG always emits the same power<sup>274</sup> whether in urban or rural areas, or in buildings where the electricity meter is located inside. One of the advantages of a meshed network architecture is that since each CNG can relay another CNG, such architecture can keep the transmission power as low as possible.<sup>275</sup>

[403] In the event a CNG is located inside a lived-in room, the Board notes that even if there is no softening effect from a casing and the building wall, occupants of this dwelling are still exposed to levels 120,000 times lower than Health Canada's standards.<sup>276</sup>

[404] The Distributor states that even while allowing for cumulative RF fields in environments where several electricity meters are gathered, the power density still remains well below the standard. According to the Distributor, even when a dwelling contains six electricity meters, the accumulated power density remains tens of thousands, even hundreds of thousands, times lower than Health Canada's standard.<sup>277</sup> In regard to technical premises in residential buildings containing several CNGs, the Board notes that the radiation level at 1 meter outside such technical rooms is not higher than at 1 meter from a single electricity meter.<sup>278</sup>

[405] The Board also finds that since the 1990s, the Distributor installed nearly 800,000 electronic meters which communicate via RF at its residential customers'. Tens of millions of this type of meters were installed in North America during the same period. These electronic meters allow short distance reading through continuous RF radiation in the 900 MHz range, at an intensity found between 0.25  $\mu\text{W}/\text{sq. meter}$  and 2.2  $\mu\text{W}/\text{sq. meter}$ . Yet, these

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<sup>273</sup> Exhibit A-0115, pages 40-42.

<sup>274</sup> Exhibit A-0106, page 37; and Exhibit A-0113, page 135.

<sup>275</sup> Exhibit A-0113, pages 73 and 74.

<sup>276</sup> Exhibit A-0115, pages 43-45.

<sup>277</sup> Exhibit B-0045, page 12.

<sup>278</sup> Exhibit A-0118, page 97.

meters which also meet standards set by Health Canada, have never generated any customer complaints about any health impact.<sup>279</sup>

[406] Although evidence clearly shows RF radiations from CNGs are well below Health Canada's standards and other standardization bodies' standards, some Stakeholders' and customers' concern focus on whether this type of RF fields may represent a health risk which is significant enough for the precautionary principle to apply.

### **7.8.2.2 Evidence on the health impact of RF fields.**

#### **The testimony of David Carpenter**

[407] S.É./AQLPA arranged a hearing of David Carpenter. The latter introduced himself as a "Public health physician." He is a "Professor of Environmental Health Sciences at the University at Albany." He is also "Director of the Institute for Health and the Environment" at the same university in the State of New York, United States.

[408] S.É./AQLPA requested the Board to recognise him as an expert witness and public health physician, including health risks associated with exposure to RF fields.

[409] The Board rejected granting the requested expert status<sup>280</sup> on the grounds that David Carpenter is not a physician, never had any clinical experience with patients and never personally performed any research on health effects of RF fields. However, the Board did not reject his testimony in this case because of his knowledge on research performed by others in this field. It therefore accepted this testimony, subject to establishing the probative value to be granted to such testimony.<sup>281</sup>

[410] The Board is of the opinion that David Carpenter's testimony is not conclusive, specifically based on reasons submitted by the Distributor in paragraphs 153 to 165 of its written argument.<sup>282</sup>

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<sup>279</sup> Exhibit A-0106, pages 150-162-0115; and Exhibit A-0115, pages 200 and 201.

<sup>280</sup> Exhibit A-0148, Decision of May 17, 2012, made forthwith, pages 110-113.

<sup>281</sup> Exhibit A-0148, page 113.

<sup>282</sup> Exhibit B-0163, pages 39-43.

[411] Cross-examination of the witness showed he was biased. Thus, contrary to *The Board's expectations pertaining to the role of expert witnesses*<sup>283</sup> (the Expectations), this witness whom this Stakeholder wanted recognized as an expert, did not present an independent and objective position but he did what the Expectations forbid: he behaved as a representative of the participant who retained him.<sup>284</sup> In this respect, during his cross-examination, David Carpenter struggled to dissociate in both reports he produced, which parts were written by him, and which parts were written by his attorney.<sup>285</sup> He admitted that Mr. Neuman and other S.É./AQLPA representatives suggested he should modify his text.<sup>286</sup>

[412] S.É./AQLPA even produced a recent commentary from Carpenter, the witness, where he criticizes a CCST {Quebec Commission on Workplace Health and Safety} report, entitled "*Health Impact of Radio Frequency from Smart Meters.*" Among other comments, Carpenter, the witness, wrote:

*"The benefit of the smart meters is entirely to the utilities, and is economic in nature. If they install smart meters they can fire those individuals who at present are employed to go around reading meters. Thus this is a job-killing proposal, and will increase unemployment in a state that already has too much."*<sup>287</sup>

[413] Clearly, Carpenter, the witness, whether or not an expert, does not meet the objectivity criteria which the Board is entitled to expect.<sup>288</sup>

#### **Dr. Michel Plante's testimony.**

[414] One of the most relevant and credible evidence presented to the Board is Dr. Michel Plante's.

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<sup>283</sup> [http://www.regie-energie.qc.ca/rgie/DirectivesInstructions/Regie\\_RoleExperts\\_18juillet2011.pdf](http://www.regie-energie.qc.ca/rgie/DirectivesInstructions/Regie_RoleExperts_18juillet2011.pdf)

<sup>284</sup> Expectations, page 3.

<sup>285</sup> Exhibit A-0149, pages 33-36.

<sup>286</sup> Exhibit A-0149, page 36.

<sup>287</sup> Exhibit A-0149, pages 220 and 221; and Exhibit C-S.É./AQLPA-0041.

<sup>288</sup> [http://www.regie-energie.qc.ca/regie/DirectivesInstructions/Regie\\_RoleExperts\\_18juillet2011.pdf](http://www.regie-energie.qc.ca/regie/DirectivesInstructions/Regie_RoleExperts_18juillet2011.pdf)

[415] Dr. Michel Plante is a medical adviser with the Health and Safety Directorate at Hydro-Quebec.<sup>289</sup> He is a freelancer, enrolled in the Quebec College of Physicians. He is not Hydro-Quebec's employee. He fills mandates for various corporations in health and safety matters.<sup>290</sup>

[416] For 15 years, he has worked as an emergency technician, but no longer practices clinical activities with patients.<sup>291</sup>

[417] For 15 years, Dr. Plante has been reviewing all studies about RF fields, mainly because of the introduction of cellular phones in the workplace.<sup>292</sup>

[418] Dr. Plante states his work mainly focuses on assessing risks for workers and the public posed by the installation of new antennas, using ever-changing scientific data, which he monitors carefully.

[419] In the context of his mandates, he does not defend the safety of RF field-radiating equipment, but explains the status of scientific research on these issues.

[420] Dr. Plante is often invited as a speaker in municipalities. In this context, he tries to best explain what RF fields are, where sources of exposure are located, and the status of scientific research in this matter.<sup>293</sup>

[421] Since early 1995, Dr. Plante gave advice and made presentations to workers, to joint committees and to managers on the evolution of knowledge in this matter.<sup>294</sup>

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<sup>289</sup> Exhibit A-0113, page 15.

<sup>290</sup> Exhibit A-0115, pages 88 and 89.

<sup>291</sup> Exhibit A-0115, page 188.

<sup>292</sup> Exhibit A-0113, page 47.

<sup>293</sup> Exhibit A-0115, page 90.

<sup>294</sup> Exhibit A-0113, page 48.

[422] As concerns on the health effects of RF fields grew and were extensively covered in the media in the context of this application, the Board considers it useful to review some parts of Dr. Plante's testimony on these issues. Such digression does certainly extend this Decision beyond the Board's usual process for such applications. However, the Board wishes the general public to be informed and educated on actual facts.

[423] Dr. Plante insists it is necessary to distinguish between what is known about RF fields and areas still under investigation. Thus, the effects of RF fields on human health are fairly well known, since for a hundred years they are connected to the use of radio, then television, then cell phones and more recently, Wi-Fi technologies.<sup>295</sup>

[424] Dr. Plante explains that RF fields are comparable to a sort of invisible light, with very low energy. Energy from RF fields does not have the ability to break links between atoms and molecules and cannot cause chemical damage to human *materials*.<sup>296</sup>

[425] depending on frequencies, very high intensity RF fields can increase the warmth of a human body. For example, Dr. Plante mentions that the temperature of a body, when exposed for thirty minutes to a 900 MHz frequency - the CNG frequency - and to a 300 W per square meter intensity, would rise by almost one degree.<sup>297</sup>

[426] The lower the intensity in watts per square meter (W/sq. meter), the less such thermal effect is measurable. Thus, standards issued by Health Canada and other agencies are much lower than 300W/sq. meter. These standards are 30 W/sq. meter for workers, and 6 W/sq. meter for the general public.<sup>298</sup>

[427] Dr. Plante explains the differences between the RF fields in terms of the use of a cell phone, and those radiated by CNGs.

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<sup>295</sup> Exhibit A-0113, pages 48 and 49.

<sup>296</sup> Exhibit A-0113, page 49.

<sup>297</sup> Exhibit A-0113 297, pages 49 and 50.

<sup>298</sup> Exhibit A-0113, page 50.

[428] Thus, at a 1 meter distance, a cell phone emits 1W/sq. meter, whereas a CNG emits 50  $\mu$ W/sq. meter. RF radiations from CNGs are therefore much lower than those from cell phones.<sup>299</sup>

[429] Dr. Plante concludes that, since there is no visible thermal effect on the human body - a clear finding, echoed from one laboratory to the next - resulting from using cellular telephones whose expositions are approximately 1,000,000  $\mu$ W/sq. meter, there are even less reasons to find any effect whatsoever when exposure levels are 50  $\mu$ W/sq. meter such as in CNGs.<sup>300</sup>

[430] In the 1990s, Dr. Plante's had to answer early questions about RF fields, while the first RF-radiating electricity meter were being installed and workers wondered about risks to their health. He based his opinion on toxicological and epidemiological studies from a very voluminous medical and scientific literature.<sup>301</sup>

[431] About Health Canada standards, Dr. Plante first points out that this organization has a long tradition of expertise in radiation protection. The first version of Safety Code 6 on RF fields was developed in the 1970s by experts from Health Canada. Health Canada's internal expertise guarantees independent practice, just like the International Workshop on Non-Ionizing Radiation - RF fields radiated by CNGs are non-ionizing<sup>302</sup> -, which cooperates with WHO. Indeed, the International Workshop on Non-Ionizing Radiation was retained as a scientific reference by the European Commission<sup>303</sup>.

[432] Dr. Plante refutes a Stakeholder's claim, who submits that European standards are 6,000 times more demanding than Canada's.<sup>304</sup> On the contrary, according to Dr. Plante, European standards on exposure to RF fields are very similar to Canada's. The difference is that in Europe, these standards are expressed in watts per kilogram, whereas in Canada, they are expressed in watts per square meter.

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<sup>299</sup> Exhibit A-0113, pages 53 and 54.

<sup>300</sup> Exhibit A-0113, page 55.

<sup>301</sup> Exhibit A-0113, page 56.

<sup>302</sup> Exhibit A-0115, page 86.

<sup>303</sup> Exhibit A-0113, page 65.

<sup>304</sup> Exhibit A-0113, pages 65 and 66.

[433] Thus, for a meter that transmits on the 900 MHz bandwidth, the Canadian standard is 6 W/sq. meter. In most European countries, the standard would be 4.5 W/sq. meter. The European is therefore not 6,000 times more demanding than the Canadian standard. Both standards are rather of the same magnitude.<sup>305</sup>

[434] With respect to RF field levels from the Zigbee card in CNGs - used to map any features that could be operational later, including domotics - Dr. Plante states that RF fields arising from the card use will be far below what he calls RF field "background noise", inside which we live twenty four hours per day.

[435] What Dr. plant terms "background noise" are RF fields which are foremost radiated by FM radio waves, television, and cellular networks, and which are present in all rooms, including, as he points out, in the Board's courtroom.

[436] At the hearing, Dr. Plante presents a graph showing the RF field "background noise." These RF fields vary from 100 to 400 microwatts per square meter, which is the sum of ambient sources continuously radiating RF fields.

[437] To this permanent source of RF fields are added RF fields from Zigbee cards, laptops, and modems. All these sources of RF fields are very low power. This is because manufacturers of electronic devices have no interest in adding powerful antennas as this would cause interference. Therefore, such equipment's antennas are not powerful but sufficiently powerful as to enable interconnection between all equipment pieces. For example, Dr. Plante refers to the Zigbee cards used in domotics, which connect devices via RF fields, and specifies that RF power radiated in this context is extremely low--- about one milliwatt.

[438] In summary, according to Dr. Plante, all these small, momentary RF field radiating sources do not for all practical purposes have much influence on RF field background noise within which we live permanently.<sup>306</sup>

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<sup>305</sup> Exhibit A-0113, pages 65 and 66.

<sup>306</sup> Exhibit A-0113, pages 67-69.

[439] When cross-examined, Dr. Plante answered several questions from S.É./AQLPA's attorney<sup>307</sup>, a Stakeholder who shows particular interest in health effects resulting from RF fields. The Board deems it useful to summarize the content of these exchanges, which are likely to inform and reassure the general public about the effects of RF fields.

[440] Thus, and contrary to what Stakeholder S.E./AQLPA seems to fear, Dr. Plante states there is no danger in approaching or touching a CNG. To be convinced, one could just compare the transmission power of a cell phone, which varies from 100 mW to 1 W, with that of a CNG which is much lower, as previously explained.<sup>308</sup>

[441] To questions about the effects of a succession of pulsed radiations - such as those from CNGs - Dr. Plante confirms that such succession does not either have any health effects. Data does not support the assumption that the number of impulses matters. Thus, the fact that RF radiations are split is not the important fact to measure health effects, but rather, thermal effects. He states that Safety Code 6 from Health Canada refers to impulses and intervals between impulses in order to calculate an average exposure to RF fields.

[442] According to Dr. Plante, S.É./AQLPA's position that the split of RF radiations is more damaging to health is not supported by experimental data. Thus, the study by David McCarty, Louisiana University, as submitted by S.É./AQLPA, cannot be accepted because it covers only one topic, is not included in the literature review, and examines the effect of a 60 Hz electric field rather than on health effects of 900 Hz RF fields.

[443] Dr. Plante takes this opportunity to explain that many people do not distinguish RF fields from electric fields. When exposed to a 60 Hz electric field, the human body does not undergo a warming effect, but rather an electric current effect. According to Dr. Plante, mistaking the effect of a 60 Hz electric field for that of RF fields - as does Stakeholder S.É./AQLPA - is the same as mistaking X-rays for visible light. Exposure to a 60 Hz electric field should be limited because it induces an electrical current through the human body. As for 900 MHz RF fields, the effect of heat on the human body, not the effect of electric current, is important. Thus, according to Dr. Plante, David McCarty's study, as mentioned in the preceding paragraph is allegedly

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<sup>307</sup> Exhibit A-0115, pages 65 and further.

<sup>308</sup> Exhibit A-0115, page 66.

not serious, since it focuses on a single topic without any witness group.<sup>309</sup>

[444] Dr. Plante also emphasizes that over the last 15 years, there has been much controversy about non-thermal effects of RF fields in connection with the introduction of cell phones. Numerous research efforts are carried out on non-thermal effects arising from the long-term use of cell phones.<sup>310</sup>

[445] According to Dr. Plante, the publication of many articles in scientific journals on the health effects of RF fields does not reflect the fact that this issue is not yet settled. He even specifies that, although studies do not support health effects of RF fields, researchers still continue their work to find out whether RF fields may cause cancer, especially in long term use; this issue remains significant.<sup>311</sup>

[446] Dr. Plante was asked to comment on the fact that the International Agency for Research on Cancer classified as "possibly carcinogenic" - Class 2B - any exposure to electromagnetic fields and why this does not change his perception.

[447] This classification was adopted due to a concern raised by an epidemiological study on cell phone use and its connection with brain cancer.<sup>317</sup>

[448] This study showed no evidence of an increased of brain cancer, except for glioma when individuals stated using the cell phones during 1,640 hours per year. The study showed an increase of 40%, which was considered statistically significant. This fragmentary result lead the International Agency for Research on Cancer to classify in Class 2B any exposure to electromagnetic fields from cell phones. However, data on glioma are not significant for meningiomas.<sup>313</sup>

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<sup>309</sup> Exhibit A-0115, pages 109-112.

<sup>310</sup> Exhibit A-0113 page 51.

<sup>311</sup> Exhibit A-0115, pages 93 and 94.

<sup>312</sup> Exhibit A-0115, page 118.

<sup>313</sup> Exhibit A-0115, pages 121 and 122.

[449] According to Dr. Plante, very weak results led the International Agency for Research on Cancer to classify radio frequencies in the 2B category<sup>314</sup>. He explains that this category stands for "possible risk"; it is used by the International Agency for Research on Cancer in the presence of the slightest doubt. Thus, coffee consumption is also classified in this category.<sup>315</sup>

[450] Dr. Plante submits that the possibility RF fields would have a carcinogenic effect is highly unlikely. He bases his opinion on the level of energy of these waves, which is very low compared to infrared or visible light, two types of light which are not carcinogenic. In the physical world, he really does not see how RF fields could be carcinogenic. Tests on animals are negative, as well as in vitro tests on living cells.<sup>316</sup>

[451] Dr. Plante underlines that in medicine, two mistakes should not be made: failing a significant diagnostic; telling a patient he has a serious illness, while he does not.

[452] Thus, the classification of the International Agency for Research on Cancer reflects this organization's cautiousness and its will to avoid the first type of error (missed diagnosis) by classifying almost everything possible as carcinogenic in principle<sup>317</sup>. Indeed, over 946 products evaluated for thirty years, only one was classified as "probably not carcinogenic"<sup>318</sup>.

[453] According to Dr. Plante, if RF fields were carcinogenic, one would expect infrareds would also be. However, it is well known that infrareds are not carcinogenic, even at high doses.<sup>319</sup>

[454] On the level of consensus within the scientific community in this regard, Dr. Plante notes that carcinogenicity data are reassuring, and show that RF fields are not a carcinogen.

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<sup>314</sup> Exhibit A-0115, page 123.

<sup>315</sup> Exhibit A-0115, page 132.

<sup>316</sup> Exhibit A-0115, pages 124 and 125.

<sup>317</sup> Exhibit A-0115, page 126.

<sup>318</sup> Exhibit A-0115, pages 124 and 125.

<sup>319</sup> Exhibit A-0115, pages 127 and 128.

[455] In this regard, Dr. Plante mentions that both the International Agency for Research on Cancer and the International Workshop on Non-Ionizing Radiation have standing committees with trained epidemiologists, biologists and physicist engineers, who continuously review studies. Health Canada and the French agency on food safety, the environment, health and nutrition reach converging conclusions.<sup>320</sup>

[456] Dr. Plante explains why he does not share the *BioInitiative* report's view, in which David Carpenter was involved, nor the recommendation from the Parliamentary Assembly of the Council of Europe, which both advocate caution.

[457] According to Dr. Plante, the *BioInitiative* report is not an objective and scientific report commissioned by a health organization. This report was never published or reviewed by peers. It was lead by Mrs. Cindy Sage, an entrepreneur, who offers protection services and equipment against electromagnetic fields. From start to finish, this report was clearly not a scientific report, but rather, a plea against standards on RF fields. This report totally ignores a whole section of literature in this area, and focuses on studies that support the authors of *BioInitiative*.<sup>321</sup>

[458] On the recommendation of the Council of Europe to set standards much lower than Canadian standards on the levels of electromagnetic fields, Dr. Plante notes that this recommendation is not in force in Europe: "*this wish was not adopted by any country.*"<sup>322</sup>

[459] On the fact that Health Canada still recommends caution with the use of cell phones, Dr. Plante states that prudence and caution are very strong values, and very widely used in medicine and public health.

[460] Thus, before a body of evidence which, from a scientific point of view, indicates there seems to be a problem, the precautionary principle means that one does not wait to gather all evidence before acting. Dr. Plante states he is in perfect agreement with this principle but submits this is not the case for RF fields radiated by CNGs.<sup>323</sup>

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<sup>320</sup> Exhibit A-0115, pages 130 and 131.

<sup>321</sup> Exhibit A- 0115, page 134.

<sup>322</sup> Exhibit A-0115, page 135.

<sup>323</sup> Exhibit A-0115, page 146.

[461] Indeed, scientific studies on RF fields clearly show not that a risk is present, but that there is no risk.

[462] However, Dr. Plante states that we should know that concerns, fears, anxieties still remain in some people.

[463] According to Dr. Plante, there is a difference between the risk perceived by some people, and the risk suspected by scientific evidence we have. He underlines that in public health, when confronted to such a situation, one must act to reduce the gap between perception and reality, and not increase such gap.<sup>324</sup>

[464] Dr. Plante submits that in some circumstances, precautions can even be contraindicated. For any preventive measure - such as vaccine or any other measure -, one must always review and analyse the potentially harmful side effects this so-called preventive measure would have.

[465] In the case of RF radiated by CNGs, if one would apply caution, while there is abundant evidence no risk exists, Dr. Plante submits that this would create more fear than good. It is not in the interest of public health to act thus.<sup>325</sup>

[466] Dr. Plante is aware that some people still believe their symptoms are connected with RF fields. On this issue, his position is similar to WHO's. Individuals who believe they suffer from electromagnetic hypersensitivity (EHS) should be invited to take part in research studies. Ideally, they would undergo a medical assessment which would be as thorough as possible. Dr. Plante remains quite convinced there is more than one cause to health problems that can be connected to EHS. Assessment by specialists is the best way to help these people.<sup>326</sup>

[467] Dr. Plante states that EHS is not a medical syndrome in the sense of the term, in other words, a combination of symptoms and clinical signs that refer to a diagnosis. He states that instead, affected people symptoms' are very different from one patient to the next.<sup>327</sup>

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<sup>324</sup> Exhibit A-0115, page 147.

<sup>325</sup> Exhibit A-0115, page 148.

<sup>326</sup> Exhibit A-0115, pages 152 and 153.

<sup>327</sup> Exhibit A-0113, page 61.

[468] Randomized or double blind studies demonstrated that people submitted to certain tests could not perceive the presence or absence of cell phone RF fields and were unable to sense the presence of such waves between sessions when exposed to real waves and simulated sessions. These studies also showed that when symptoms appeared, they appeared during both simulated sessions and sessions with actual exposure to RF fields.<sup>328</sup>

[469] These works were reviewed by several organizations in Canada, by international commissions, and by expert groups with the European Commission. The conclusions from these studies are unanimous and widely converge: today, one may not reasonably connect a cell phone user's symptom or clinical sign to radiated RF fields.<sup>329</sup>

[470] The EHS issue was also raised in the 1990s when computers appeared in offices, and was also extensively researched over the past fifteen years.

[471] According to Dr. Plante, studies on EHS show that electromagnetic fields are not involved. According to him, symptoms - even though they are real - felt by some people have other causes. Studies show that neither RF fields nor 60 Hz very low level fields may explain symptoms in people claiming they suffer from EHS.<sup>330</sup>

**Departments and agencies involved.**

[472] The Board also considers it important to mention WHO's recommendations intended for governments and physicians, on the approach to take with patients with symptoms they attribute to EHS. MSSS<sup>331</sup> and Health Canada<sup>332</sup> also refer to these recommendations.

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<sup>328</sup> Exhibit A-0113, pages 52 and 53.

<sup>329</sup> Exhibit A-0113, page 53.

<sup>330</sup> Exhibit A-0113, page 59.

<sup>333</sup> Exhibit D-0062.

<sup>332</sup> Exhibit B-0085.

[473] WHO's Factsheet Nr. 296, dated December 2005, entitled "Electromagnetic fields and public health: Electromagnetic Hypersensitivity"<sup>333</sup> states:

*EHS is characterized by a variety of non-specific symptoms that differ from individual to individual. The symptoms are certainly real and can vary widely in their severity. Whatever its cause, EHS can be a disabling problem for the affected individual. EHS has no clear diagnostic criteria and there is no scientific basis to link EHS symptoms to EMF exposure. Further, EHS is not a medical diagnosis, nor is it clear that it represents a single medical problem.*

**Physicians:** *Treatment of affected individuals should focus on the health symptoms and the clinical picture, and not on the person's perceived need for reducing or eliminating EMF in the workplace or home. This requires:*

- *a medical evaluation to identify and treat any specific conditions that may be responsible for the symptoms,*
- *a psychological evaluation to identify alternative psychiatric/psychological conditions that may be responsible for the symptoms,*
- *an assessment of the workplace and home for factors that might contribute to the presented symptoms. These could include indoor air pollution, excessive noise, poor lighting (flickering light) or ergonomic factors. A reduction of stress and other improvements in the work situation might be appropriate.*

*For EHS individuals with long lasting symptoms and severe handicaps, therapy should be directed principally at reducing symptoms and functional handicaps. This should be done in close co-operation with a qualified medical specialist (to address the medical and psychological aspects of the symptoms) and a hygienist (to identify and, if necessary, control factors in the environment that are known to have adverse health effects of relevance to the patient).*

<sup>333</sup> <http://www.who.int/mediacentre/factsheets/fs296/en/index.html>

*Treatment should aim to establish an effective physician-patient relationship, help develop strategies for coping with the situation and encourage patients to return to work and lead a normal social life.*

***EHS individuals:*** *Apart from treatment by professionals, self help groups can be a valuable resource for the EHS individual.*

***Governments:*** *Governments should provide appropriately targeted and balanced information about potential health hazards of EMF to EHS individuals, health-care professionals and employers. The information should include a clear statement that no scientific basis currently exists for a connection between EHS and exposure to EMF.*

***Researchers:*** *Some studies suggest that certain physiological responses of EHS individuals tend to be outside the normal range. In particular, hyper reactivity in the central nervous system and imbalance in the autonomic nervous system need to be followed up in clinical investigations and the results for the individuals taken as input for possible treatment." [Emphasis added.]*

[474] Also, WHO's Factsheet Nr. 304, dated May 2006, entitled "Electromagnetic fields and public health: Base stations and wireless technologies"<sup>334</sup> provides as follows:

*Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence that the weak RF signals from base stations and wireless networks cause adverse health effects.*

**WHO Initiatives**

*WHO, through the International EMF Project, has established a programme to monitor the EMF scientific literature, to evaluate the health effects from exposure to EMF in the range from 0 to 300 GHz, to provide advice about possible EMF hazards and to identify*

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<sup>334</sup> <http://www.who.int/mediacentre/factsheets/fs304/fr/index.html>.

*suitable mitigation measures. Following extensive international reviews, the International EMF Project has promoted research to fill gaps in knowledge. In response national governments and research institutes have funded over \$250 million on EMF research over the past 10 years.*

*While no health effects are expected from exposure to RF fields from base stations and wireless networks, research is still being promoted by WHO to determine whether there are any health consequences from the higher RF exposures from mobile phones.*

*The International Agency for Research on Cancer (IARC), a WHO specialized agency, is expected to conduct a review of cancer risk from RF fields in 2006-2007 and the International EMF Project will then undertake an overall health risk assessment for RF fields in 2007-2008."*  
[Emphasis added]

### **7.8.2.3            *The Board's conclusions on RF fields and CNGs***

[475] Clearly, we live in a world of wireless communications; we are constantly exposed to environmental RF field noise which ranges from 100  $\mu\text{W}/\text{sq. meter}$  to 400  $\mu\text{W}/\text{sq. meter}$ .

[476] At a 1 meter distance, RF fields radiated by CNGs have a power density of 50  $\mu\text{W}/\text{sq. meter}$ . At a 3-meter distance, this power density is only 5.6  $\mu\text{W}/\text{sq. meter}$ .

[477] RF radiations from CNGs are 20,000 to 300,000 times lower than effective standards.

[478] The RF radiation level from CNGs is much lower than that from a cell phone: 50  $\mu\text{W}/\text{sq. meter}$  for a CNG, vs. 1,000,000  $\mu\text{W}/\text{sq. meter}$  for a cell phone.

[479] Evidence submitted to the Board shows that many CNG are installed in a lived-in room in an apartment, which does not significantly increase the level of RF fields radiation, which is still tens of thousands times lower than Health Canada's standard.

[480] Opinions from public health authorities, and the state of scientific research on the impacts and non-thermal effects of this type of RF fields on health, clearly confirm there is no danger to health.

[481] On the EHS issue, randomized or double-blind studies show there is no scientific and medical evidence establishing a connection between symptoms of individuals who claim they suffer from EHS, and RF fields.

[482] from reviewing evidence it heard, The Board concludes that the Project does not present a risk level that would justify applying the precautionary principle. Such principle applies when a risk of serious injury or irreversible health damage is acknowledged. Evidence does not show this to be the case, and goes rather in the opposite direction.

[483] However, the Board recognizes that concerns in this regard will remain in the public. As underlined by Dr. Plante and recommended by WHO, the public needs to be appropriately and objectively informed, and not be unduly alarmed in this regard.

### 7.8.3 SOCIAL ACCEPTABILITY

[484] The Project's social acceptability is important since it may impact on its economic viability.

[485] The Distributor has stated IT intends to enhance its communication efforts once the Project receives the Board's approval. Its communications plan will be to respond directly to its customers' concerns.<sup>335</sup> This approach is also in line with recommendations from Accenture (its consultant): "*Be proactive and disseminate information on anticipated changes, by focusing on tangible benefits to customers.*"<sup>336</sup>

[486] ROÉÉ specifically insisted on the fact that the project should focus on customer needs, improving customer service, and implementing features that have positive environmental and social impacts. According to this Stakeholder, this would help "*better sell the project*"<sup>337</sup>.

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<sup>335</sup> Exhibit B-0088, page 29.

<sup>336</sup> Exhibit B-0088, page 15,

<sup>337</sup> Exhibit A-0135, page 158.

[487] This proposal from ROEE is basically interesting; it is however beyond the Project scope as defined by the Distributor and accepted by the Board. The Project must then be presented to customers as it is, in other words, a structuring project, providing efficiency gains, bringing immediate benefits to customers, including invoices that are no longer based on estimations, and possibly offering them modern and efficient tools to manage their electricity consumption, including many domotics features.

[488] Even if the Distributor included the Project within in a specific scope, it nevertheless stresses that it intends on implementing as early as 2012 and 2013 some features which are currently outside the Project scope, such as early detection of power failures and interruptions, detailed profiles of online customers' consumption, detection of power theft, and various energy efficiency measures in connection with the CATVAR Project.<sup>338</sup>

[489] Therefore, the Distributor is working on a transparent and structured communication plan to provide maximum information to its customers on all technical aspects of the Project.<sup>339</sup>

[490] The Board encourages the Distributor to inform its customers about the Project's immediate and future benefits both for them and for the environment. Customers must also be objectively and adequately informed on RF field radiations from CNGs.

[491] However, as the Board stats, it is possible that some individuals reject any installation of CNGs in their homes. Should this occur, as stated above, the Board requested<sup>340</sup> during the February 2, 2012, preparatory meeting, that the Distributor finds a solution to this problem.

[492] In response to Board's request, and to accept some customers' choice, the Distributor filed an application (File R-3788-2012) to set the rate terms pertaining to the Opt-out option which may be claimed by customers who choose not to join the Distributor's basic offer, namely, installation of a CNG.

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<sup>338</sup> Exhibit B-0098, pages 15 and 16.

<sup>339</sup> Exhibit A-339 O 118, page 137.

<sup>340</sup> Exhibit A-0050, page 7.

[493] In this regard, the Board makes this day a decision on rate terms that apply to the Opt-out option.

**7.8.3.1 SCFP-FTQ and social acceptability of the Project**

[494] As mentioned above, SCFP-FTQ orchestrated a negative publicity campaign about the Project. This Stakeholder also submitted into evidence a survey and a petition obtained after such campaign. Based on such evidence, this Stakeholder submits the Project is not socially acceptable.

[495] SCFP-FTQ filed confidential original documents from the "*Compteurs en Or*" {Gold Meters} campaign.<sup>341</sup>

[496] The message broadcast during primetime hours on radio and television substantially communicated the following message:<sup>342</sup>

*"[...] Everyone loses with gold meters [...] 1,000 jobs lost [...] \$1 billion at stake [...] 8 million job losers [...] HQ will create unemployment and huge waste by replacing all our electricity meters with expensive, unprofitable gadgets [...] that could even increase your electricity bill [...]."*

The announcer then throws a Gold Meters pamphlet into the trash basket, saying:

*"[...] who wins what at this game [...]."*

An invitation to visit the website follows:

*"<http://www.compteursenor.com>"*

[497] The Board considers this advertising is rather suggestive and seeks to negatively influence public opinion.

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<sup>341</sup> Exhibit C-SCFP-FTQ-0016.

<sup>342</sup> Exhibits C- SCFP-FTQ-0027 to C-SCFP-FTQ-0039.

[498] On the back of a document with the appearance of a gold electricity meter, entitled "Hydro-Quebec's Gold Meters," the wording in the petition reads as follows:

"No, I do not agree with Hydro-Quebec spending \$1 billion and unnecessarily sacrificing 1,000 jobs to replace existing electricity meters!"

[499] Is it then surprising to find that about 10,000 individuals aware of this Project would signal their disapproval?

[500] The Board grants no probative value to such evidence as submitted by SCFP-FTQ on the issue of the Project's social acceptability. The negative advertising campaign from SCFP-FTQ mobilized some people, but the public did not receive complete information on the Project, specifically, its advantages.

[501] The numerous emails sent to the Board are mainly due to this negative advertising campaign, and are therefore not likely to enlighten the Board on the Project's social acceptability.

#### **7.8.3.2**        *SCFP-FTQ and the Project's impact on Quebec's economy.*

[502] SCFP-FTQ estimates the Project will have a negative impact on Quebec's GDP in the amount of \$14.7 million per year, due to the loss of a thousand direct and indirect jobs.<sup>343</sup>

[503] This Stakeholder based its calculation on meter readers' spending on goods and services, and tax revenues related to such spending.<sup>344</sup>

[504] However, claiming the Project will scrap 1,000 jobs in the Distributor's company is not correct. SCFP-FTQ does not consider the number of retirements, usual staff turnover, and especially the fact that if reader jobs are eliminated, other higher added value jobs, particularly in the information technology fields, are created. In fact, as mentioned above, 180 permanent employees will be relocated within Hydro-Quebec, while 2,150 positions will be filled in various fields.

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<sup>343</sup> Exhibit C-SCFP-FTQ-0044, page 27; and Exhibit C-SCFP-FTQ-0011, pages 35-38.

<sup>344</sup> Exhibit C-SCFP-FTQ-0011, page 39.

[505] The project should enable implementation of features that let consumers better manage their electricity consumption and the Distributor have more complete data to effectively manage its power distribution network. All is consistent with Quebec government's desire to ensure that energy is more efficiently used and consumed in the future. <sup>345</sup>

**7.8.4 CYBER SECURITY, PRIVACY AND USE OF DATA COLLECTED.**

[506] Several Stakeholders expressed concern about security of data recorded, transmitted and collected by the Distributor using CNGs and IMA. Specifically, some Stakeholders expressed concern about access and use of consumers' consumption patterns as recorded every 15 minutes by CNGs and thus, in a very accurate manner.

[507] As stated above, ACEFQ referred to the Access Act to remind the Board that detailed information on consumers' consumption from CNGs, when personalised, is personal information within the meaning of this Act <sup>346</sup> and must therefore be protected.

[508] S.É./AQLPA also expressed concern on the issue of customers' privacy. This Stakeholder requested the Distributor submit measures it will implement to protect collected data against their interception or theft by third parties. This Stakeholder also asked that the retaining and destroying process of customer data be specified. <sup>347</sup>

[509] ACEFQ proposes amending the terms of service so as to include provisions governing the Distributor's use of customers' consumption patterns.

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<sup>345</sup> Quebec Energy Strategy, 2006-2015 "Using energy to build tomorrow's Quebec", pages 6 and 55; <http://www.mrnf.gouv.qc.ca/publications/energie/strategie/strategie-energetique-2006-2015.pdf>.

<sup>346</sup> Exhibit C-ACEFQ-0026, pages 13 and 14.

<sup>347</sup> Exhibit C-S.É./AQLPA-0114, page 71.

[510] UC submits that data collected by CNGs and AMI should be used only to meet billing and network management requirements.<sup>348</sup>

[511] The Board understands that data collected through CNGs and AMI will be used by the Distributor for billing purposes but also to improve its forecast of energy requirements and network performance through a better knowledge of cumulative profiles by corridor, subnet and region.

[512] On the cyber security of data stored, transmitted and collected by CNGs and AMI, the Board is satisfied with the measures taken by the Distributor presented as evidence and summarised as follows:

*"In summary, security measures implemented are numerous and varied. The main measures are:*

- A description of security measures is considered by the Distributor as strategic information and access to such information is restricted to the Distributor's employees if absolutely necessary in the course of employees' duties.*

- The AMI network is dynamic; the paths used to transmit information are numerous.*

- Data that travel over the AMI network are at all times encrypted AMI using custom keys, and a specific algorithm.*

- Equipment (next generation meters, routers, and collectors) which act as relays, have no information on the topological source of information.*

*In conclusion, the Distributor took all necessary steps to minimize risks related to equipment and information safety, in particular:*

- Hacking the system, by creating a gateway which communicates with the "virtual meter" network; [Footnote omitted]*

- Intercepting data between the emitting meter and the meters used as relays,, and between meters and the communication network (routers, collectors)." [Footnote omitted]<sup>349</sup>*

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<sup>348</sup> Exhibit C-UC-0045, page 37.

<sup>349</sup> Exhibit B-0072, pages 24 and 25.

[513] These cyber security measures were validated and qualified by Lofty Perch, a security firm, as being numerous, varied, efficient and robust.<sup>350</sup> These measures also apply to routers and collectors, which minimizes any risk of data interception.<sup>351</sup>

[514] As concerns the protection of detailed data on customers' consumption, which qualify as "personal information" under the Access Act, the Board insists that the Distributor is, and continues to be, subject to this Act.

[515] As mentioned above, the Distributor such that access to such information is restricted to its employees, for whom such data are absolutely required in the course of their duties.

[516] The Board is also satisfied with security measures (data encryption, data/customers dissociation) taken by the Distributor, so data recorded by CNGs and transmitted via AMI may not be intercepted by third parties. Such measures also ensure that even if this occurs, the third party who acquired said data could not link any Distributor's customer with personal data intercepted.<sup>352</sup>

[517] The Board is also satisfied with the confidential processing measures for such data by the Distributor's employees.

[518] Furthermore, evidence shows that the Distributor constantly monitors the evolution of information technology, and is active with international organizations working in this field, which lets the Distributor enter into partnerships in order to strengthen its knowledge and business practices.<sup>353</sup> Thus, the Distributor will be able to enrich its knowledge and adapt its security measures to technological developments.

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<sup>350</sup> Exhibit B-0072, page 24.

<sup>351</sup> Exhibit B-0072, page 25.

<sup>352</sup> Exhibit B-0072, page 22.

<sup>353</sup> Exhibit B-0166, page 11; Exhibit A-0099, pages 38 and 39; and Exhibit B-0103, pages 3 and 4.

## **7.9 PERMITS REQUIRED UNDER OTHER LAWS.**

[519] This regulatory requirement is satisfied. As mentioned above, the Project as such does not have to be authorised under other laws. Certificates of compliance for the equipment were filed in this case. With the exception of CNGs which will be installed at customers' sites, the Distributor mainly installs AMI equipment on its own facilities (electric poles, etc.). No special legal authorisation is required for their installation.

## **7.10 THE BOARD'S GENERAL CONCLUSION.**

[520] The approval of a proposed \$10 million or more investment requires the Distributor to provide the Board certain information, including costs associated with the project, an economic feasibility study for the project and if appropriate, other alternatives considered together with relevant information.

[521] However, the Distributor presented the Project in a different manner, both in terms of its economic feasibility and proposed solutions.

[522] The economic analysis submitted by the Distributor concerns the Project in its entirety, not only on its phase 1. This first phase, which is the subject of this authorisation application, concerns deploying AMI, IT and CNGs in the Greater Montreal only. Two other phases will follow and will complete deployment of CNGs throughout the territory served by the Distributor. However, the Board is not called upon to authorise the three Project phases in this case, but phase 1 only.

[523] Some Stakeholders criticized this stepwise approach. For its part, the Board considers that this approach is appropriate and prudent. The Project is expected to generate efficiency gains in the future. With this purpose, the Distributor chose to present not only costs for phase 1, but those of the whole Project.

[524] Obviously, by allowing investments for the Project's phase 1, the Board authorises some investments that will help subsequent phases of the Project (IT and IMA). However, a step by step approach will enable the Board when the Project phases 2 and 3 are submitted, to analyse new investments required, and determine whether they are useful or necessary in the context of the Project evolution.

[525] The Board approves the project since results from four economic analyses, including feasibility studies, enable validating the robustness of the AMI scenario compared to the baseline scenario. In this regard, the Stakeholders proposed many changes to assumptions and calculation methods for both scenarios, specifically resulting in an increase in costs for the AMI scenario, and a decrease in costs for the baseline scenario. However, no results enabled the Board to conclude that the AMI scenario is not the most profitable project.

[526] As to the *other solutions contemplated*<sup>354</sup> by the Distributor for the Project, one must remember that the Distributor submitted calls for bids in order to obtain proposal that would be open to all communication technologies available. However, the bids received that met the objectives of ensuring sustainability of the meter fleet, making efficiency gains, and enabling new services to customers, were based on implementing a wireless technology and acquiring CNGs.

[527] The Board is also of the opinion that the results of pilot projects helped ensure proper operation of measurement and billing processes, as well as a set of critical parameters, in particular those related to the deployment rate and interoperability of AMI equipment.

[528] In addition, the Board considers the following facts provide reasonable assurance that the Project will be carried out within the budget: (i) CNGs are provided at a firm price, (ii) telecommunication services are offered by a large company with terms included in an agreement, and (iii) a significant portion of the meter installation operations is performed by a subcontractor at a set cost.

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<sup>354</sup> Regulation, Section 2(9).

[529] However, it is important to recognize that such a project is not devoid of risks including in terms of projected costs and anticipated efficiency gains, despite the mitigation plan, contingencies and other measures established by the Distributor.

[530] Therefore, the issue of follow-up has given rise to several questions from the Board and the Stakeholders.<sup>355</sup>

[531] The Distributor states it set up a Project Office; and a team is dedicated to the Project success and follow-up as recommended by Accenture.<sup>336</sup> The Distributor also proposed submitting to the Board quarterly monitoring reports regarding deployment costs and Project performance.<sup>357</sup>

[532] Consequently, the Board requests the Distributor to transmit the following information at intervals specified below:

- In one year, a review of the communication plan intended to answer questions and concerns from its customers; data on the number of customers who used the Opt-out option, and impact on the Project deployment and costs;
- On a quarterly basis, follow-up on costs and Project schedule, including the following information:
  - o Planning of CNG installation per quarter for the entire phase 1;
  - o The number of CNGs actually installed by quarter;
  - o The number of customers who use the Opt-out option per quarter;
  - o The anticipated costs of the Project phase 1 per quarter;
  - o The actual costs of phase 1 by quarter;
  - o An explanation of variances in costs and schedule, and new forecast, if any;
  - o The status of the realisation of efficiency gains;

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<sup>355</sup> Exhibit B-0016, page 20; Exhibit B-0039, pages 9 and 17; Exhibit A-0099, pages 79 and 93; Exhibit A-0104, pages 210 and 211; Exhibit A-0106, pages 93 and 94; Exhibit A-0125, page 239; Exhibit B-0166, page 22, Exhibit C-FCEI-0032; and Exhibit C-S.É./AQLPA-0114, page 12.

<sup>356</sup> Exhibit B-0088, page 42.

<sup>357</sup> Exhibit B-0166, page 22.

o The number of customer complaints received by quarter, classified by complaint type.

- Periodically and depending on the Project evolution, submit the status of implementation of other features that are outside the current scope, but are considered by the Distributor under the schedule filed during the hearing.<sup>358</sup>

[533] As mentioned above, eligibility to the Distributor's service cost of investments which exceed the Project budget; operating costs resulting from efficiency gains but unrealised will, where appropriate, be subject to a Board's decision in the framework of an application under Section 48 of the Act.

[534] In such case, according to the significance of rate issues resulting from cost overruns if any, the Distributor may choose, either an application to process such costs as part of its normal rate application, or separately. In this respect, and on the basis of quarterly monitoring reports it receives, the Board may also on its own initiative, summon the Distributor as provided in Section 48 of the Act.

[535] **On these grounds:**

**The Energy Board:**

**GRANTS** this application;

**AUTHORISES** the Distributor to implement the Project - Phase 1, as described in Exhibit B-0006;

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358 Exhibit B-0098, pages 15 and 16.

**AUTHORISES** the Distributor to record within the deferred costs account created by D-20 10-078 Decision, all 2012 costs related to the Project - Phase 1 in accordance with terms approved by the Board in its 10-022 D-20 Decision;

**REQUESTS** the Distributor file follow-up reports required in paragraph 532.

*{Hand Signature}*

Richard Lassonde

Manager

**Representatives:**

- Association coopérative d'économie familiale de l'Outaouais (ACEFO) {Family Economics Cooperative Association of Outaouais Region}, represented by Ms. Stéphanie Lussier;
- Association coopérative d'économie familiale de Québec (ACEFQ) {Cooperative Association of Family economics of Quebec}, represented by Mr. Denis Falardeau;
- Association des redistributeurs d'électricité du Québec (AREQ) {Association of Québec Electricity Redistributors}, represented by Mr. Serge Cormier;
- Fédération canadienne de l'entreprise indépendante (FCEI) {Canadian Federation of Independent Enterprises}, represented by Mr. André Turmel;
- Groupe de Recherche Appliquée en Macroécologie (GRAMÉ) {Group for Applied Research in Macroecology}, represented by Ms. Geneviève Paquet;
- Hydro-Quebec, represented by Mr. Jean-Olivier Tremblay, and Ms. Marie-Josée Hogue;
- Option consommateurs (OC) {Consumers' Option}, represented by Mr. Éric David;
- Regroupement des Organismes Environnementaux en Énergie (ROÉÉ) {Merger of Environmental Organizations for Energy}, represented by Ms. Jacynthe Ledoux;
- Regroupement national des conseils régionaux de l'environnement du Québec (RNCREQ) {Quebec National Merger of Regional Councils for the Environment}, represented by Ms. Annie Gariépy;
- Stratégies énergétiques et Association québécoise de lutte contre la pollution atmosphérique (S.É./AQLPA) {Energy Strategies and Quebec Association Against Air Pollution}, represented by Mr. Dominique Neuman;
- Syndicat des employé-e-s de techniques professionnelles et de bureau d'Hydro-Québec, Section locale 2000 (SCFP-FTQ) {Hydro-Quebec Professional Techniques and Office Employees' Union, local 2000}, represented by Ms. Louise-Hélène Guimond;
- Union des consommateurs (UC) {Consumers' Association}, represented by Ms Hélène Sicard;
- Union des municipalités du Québec (UMQ) {Association of Quebec Municipalities}, represented by Mr. Steve Cadrin.

[153] Furthermore, several important elements for evaluating Mr. Carpenter's credibility were revealed during this "*voir-dire*" [trial within a trial]. Although Mr. Carpenter portrays himself on the University of Albany's website as having a doctorate degree, the witness confirms, however, that he does not have a doctorate degree, but merely a [cut off] ...

[...] Mr. Carpenter is also not licensed to practice as a member of the "American Board of Preventive Medicine." Despite this, Mr. Carpenter uses the expression "physician" and claims that he is authorized to practise in the United States, which is inaccurate<sup>144</sup>:

Q. [27] Are you licensed to practice medicine or have you ever been licensed to practice medicine?

A. No. In the U.S., you have to take internships in order to get a medical license. You have to take three exams. I've taken the first two.

Q. [37] And you're using the expression "physician". Are you authorized to use the "physician" expression? Because I know that in the state of New York there are some provisions dealing with the use of the "physician" expression. Are you authorized to use it since you're not a licensed doctor?

A. My official position with the New York State Department of Health was as a Research Physician.

Q. [38] Research physician?

A. So, the answer is definitely yes. Now, the term "physician" in general means you have a medical education. There certainly have been some people that have abused that term, that have other degrees, but the term "Public Health Physician" in general implies that someone is not licensed to practice medicine, but they're trained in public health.

New York State *Education Law*, article 131, paragraph 6522 :

§6522. Practice of medicine and use of title "physician". Only a person licensed or otherwise authorized under this article shall practice medicine or use the title "physician".

[154] Mr. Carpenter admits that he has never conducted research on radiofrequencies either himself or within a group<sup>145</sup>. The only articles in which Mr. Carpenter may have taken part are opinion-based and all against RFs<sup>146</sup>.

<sup>142</sup> Website of the State University of New York at Albany:  
<http://www.albany.edu/news/experts/8212.php>. Résumé of Mr. Carpenter, C-SE-AQLPA-0060, page 1, page 48, N.S., May 17, 2012.

<sup>143</sup> Testimony of D. Carpenter, N.S., May 17, 2012, at pp. 48-49.

<sup>144</sup> Testimony of D. Carpenter, N.S., May 17, 2012, at pp. 48-52; New York State *Education Law*, article 13 I, para. 6522.

<sup>145</sup> Testimony of D. Carpenter, N.S., May 17, 2012, at pp. 52 and 64.

<sup>146</sup> Testimony of D. Carpenter, N.S., May 17, 2012, at pp. 60 *et seq.*

[155] Mr. Carpenter acted as a co-editor of the BioInitiative Report<sup>147</sup>, which was considered at length. It was his greatest involvement in a project focusing on RFs. However, the report was widely criticized, as admits Mr. Carpenter<sup>148</sup>, and, in fact, was not supported by any scientific group:

But I think it's fair to say that there's been more criticism than official groups that have supported it. I wouldn't deny that.<sup>149</sup>

[156] Mr. Carpenter never testified as an expert witness in a case dealing with radiofrequencies, and no court ever considered him to be an expert in the field. Only once did he file a written statement, but the trial has not yet taken place<sup>150</sup>. In fact, it should be added that, to our knowledge, Mr. Carpenter's testimony was never retained by a court; instead, his methodology and neutrality have been criticized<sup>150</sup>.

[157] It should furthermore be emphasized that Mr. Carpenter did not bother to inquire about the technical features of the meters under review<sup>152</sup>:

A. The only information I have is what is in my, the early part of my report.

Q. [94] Nothing else?

A. Nothing else.

Q. [95] Okay.

A. And again, that is not, that is second hand information.

[158] Mr. Carpenter's adversarial and argumentative position against smart meters became quite clear when a question was asked by the president, Mr. Lassonde, when referring to a report in which Mr. Carpenter wrote<sup>153</sup>:

Q. And then, you start by writing,

The benefit of smart meters in entirely to the utilities, and is economic in nature. If they install smart meters, they can fire those individuals who at present are employed to go around reading meters. Thus, this is a job-killing proposal, and will increase unemployment in a state that already has too much.

I presume you refer to the State of New York?

A. That was the State of California.

<sup>147</sup> David Carpenter & Cindy Sage, *Bioinitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF)*, August 31, 2007, filed as exhibit C-SEAQLPA-OOn, page 2.

<sup>148</sup> Testimony of D. Carpenter, N.S., May 17, 2012, page 73.

<sup>149</sup> Testimony of D. Carpenter, N.S., May 17, 2012, page 73.

<sup>150</sup> Testimony of D. Carpenter, N.S., May 17, 2012, page 76.

<sup>151</sup> *Darren Allgood et al. v. General Motors Corporation*, 2006 U.S. Dist. Lexis 70764 (U.S. District Court for the Southern District of Indiana, Indianapolis), filed as exhibit 8-0133.

<sup>152</sup> Testimony of D. Carpenter, N.S., May 18, 2012, at pp. 50-51 and 53.

<sup>153</sup> Testimony of D. Carpenter, N.S., May 18, 2012, at pp. 219-221.

Q. [485] And you conclude your comment on this report by saying,

Clearly, the answer to this dilemma is not to install wireless smart meters to begin with.

[159] It is submitted that such a bias, so clearly expressed, is obviously enough to disregard Mr. Carpenter's testimony and report.

[160] Moreover, HQD respectfully submits that Mr. Carpenter's testimony as a *de facto* witness, who received a mandate to conduct an objective and complete review of the scientific literature for the possible and potential risks of RFs on human health must be completely set aside.

[161] In fact, Mr. Carpenter's cross-examination clearly showed that he did not conduct an objective and/or complete review of the literature, but rather tried to justify his own opinion, i.e., that radiofrequencies can cause non-thermal effects that, in his opinion, could cause an increased risk of cancer.

[162] Not only did Mr. Carpenter's cross-examination reveal a totally defective methodology, but also that he had failed to consider several serious studies having a completely opposite position. This obvious bias results in Mr. Carpenter's testimony being devoid of any evidentiary weight and the Regie can certainly not rely on it.

[163] Mr. Carpenter explained<sup>154</sup>:

A. I think that I have included in this report every meta-analysis that I am aware of that has been written on the issue of radio frequency fields. And, to some degree, also on ELF fields. One of the reasons for focusing on meta-analyses is to save time and attention. [... ]

Q. Okay. So, your position is that if someone looks at all the references you made in your report, to researches, to articles, to meta-analyses, we can get a good sense of the state of the science as of now?

A. Yes, I do.

[164] However, despite that, Mr. Carpenter makes no reference to the meta-analysis prepared by Mr. Repacholi, nor to the study prepared by the CSST, although he admitted to being familiar with it.

[165] It should also be highlighted that several studies cited by Mr. Carpenter do not in any way uphold his findings. In other cases, he cited previous studies that arrived at conclusions that served his own purpose, while omitting more recent studies from the same authors that arrived at a different conclusion, i.e., the failure to show an increased risk of cancer following exposure to low-intensity RFs. We find this lack of intellectual thoroughness to be disastrous.

<sup>154</sup> Testimony of D. Carpenter, N.S., May 18, 2012, at pp. 47 and 49.