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October 31, 2011

DELIVERED

Ms. Kirsten Walli
Board Secretary
Ontario Energy Board
P.O. Box 2319
2300 Yonge Street, 27th floor
Toronto, ON M4P 1E4

Dear Ms. Walli:

RE: **Toronto Hydro-Electric System Limited's ("THESL")**
Application for 2012-2014 Electricity Distribution Rates
OEB File No. EB-2011-0144
Preliminary Issue – THESL Witness Statements and Curriculum Vitae

Please find enclosed three copies of the witness statements and CVs of the following:

- Anthony Haines, President and CEO of Toronto Hydro Corporation and President of THESL;
- Jean-Sebastien Couillard, CFO of THESL; and
- Colin McLorg, Manager, Regulatory Policy and Relations of THESL.

Yours truly,

[original signed by]

Amanda Klein
Senior Regulatory Counsel
Legal Services Division
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cc: J. Mark Rodger, Borden Ladner Gervais
Intervenors of record, EB-2011-0144

Q1. Mr. Haines, you are the President and CEO of Toronto Hydro Corporation and President of Toronto Hydro-Electric System Limited?

A1. Yes.

Q2. What is the purpose of your testimony today?

A2. I will summarize the central reasons why THESL is unable to manage its resources and financial needs under 3rd Generation Incentive Regulation Mechanism ("IRM"). In particular, I will describe the way in which Toronto Hydro-Electric System Limited ("THESL") faces exactly the circumstances that Mr. McLorg described in his witness statement.

For ease of reference, Mr. McLorg has set out for the Ontario Energy Board (the "Board") that:

(a) there is a class of utilities who face certain structural costs pressures which cannot be accommodated under IRM; and
(b) for those utilities described in (a), IRM creates a structural deficit in allowed revenue requirement that would be severely problematic for both those utilities and their customers.

In short, and as I explain in further detail below, IRM will predictably result in following outcomes for THESL:

- does not allow for a financially-viable capital investment strategy;
- fifty percent of the capital invested during rebasing years is not recovered until the next rebasing period (and the opportunity cost of THESL's return and the interim depreciation is entirely lost);
- results in a breach of Toronto Hydro Corporation's bond covenants within twenty-four months;

- changes THESL's asset replacement cycle from 40 years to nearly 100 years;
- builds-in an impossible scenario of catch-up every four years (resulting in rate shock to customers);
- ignores the need for workforce renewal; and
- leaves THESL without the qualified personnel needed to operate the company.

Q3. What specific topics will you address?

A3. I will discuss in general terms the way in which THESL is in the circumstances of a utility that, by the imposition of IRM, would face a significant structural deficit in allowed revenue requirement that is severely problematic for both THESL and its customers. I will address this general issue by way of:

(a) describing THESL's particular capital renewal needs (in broad terms) and prudent management of a capital renewal program such as THESL's;
(b) discussing the fundamental tension that IRM creates between THESL's duties as a distributor and its opportunity to earn a fair return; and
(c) discussing certain material adverse consequences that are reasonably predictable if IRM is imposed on THESL. [1]

Q4. What are THESL's needs for capital renewal, stated in broad terms?

A4. The vintage of THESL's plant is old - approximately one third of it is past its end of life.[2] The deterioration of THESL's capital assets will continue until they are replaced. Further, and as contrasted with younger, growing utilities, the majority of capital work

[1] In general, the portions of the evidence that this witness statement is based on can be found at Exhibit A1-T2-S1 (p. 2-10 and 21-33 in particular), as well as THESL's interrogatory responses. Specific and additional references are provided below for convenience, including references to certain exhibits that, while themselves are not the subject of examination during this Preliminary Issue phase of the proceeding, may be of assistance to intervenors and the Board pursuant to Procedural Order No. 3.
[2] See Exhibits D1-T7-S5 (p. 3-46) and D1-T7-S6 (p. 22-51).

completed by THESL does not create new revenues or attract capital contributions. As THESL's plant is highly depreciated, it contributes very little to revenue requirement.[3]

In particular, THESL estimates that the annual amount required to sustain THESL's distribution system is approximately $600 million in each of the next 10 years alone.[4] THESL's needs in this regard are not new and it has made its case to the Board regarding the critical importance of its growing asset and workforce-renewal needs since 2006.[5] Indeed, it is my view that the settlement of THESL's last two rate cases[6] illustrate the way in which the Board and intervenors have acknowledged and agreed with THESL regarding both the importance and quantum of THESL's increasing capital renewal needs.

In the past 5 years, we have learned much more about the serious nature of the age and condition of THESL's distribution plant, and have accordingly (and pursuant to Board orders) filed comprehensive asset condition details in each of THESL's rate filings.[7] While the conclusions of these studies - and in particular the quantum of the capital spend which THESL believes is required - can and should be tested in a comprehensive manner with the fullness of a Cost of Service hearing on all of THESL's evidence, there are certain basic facts which flow from these studies and can be stated in general terms:

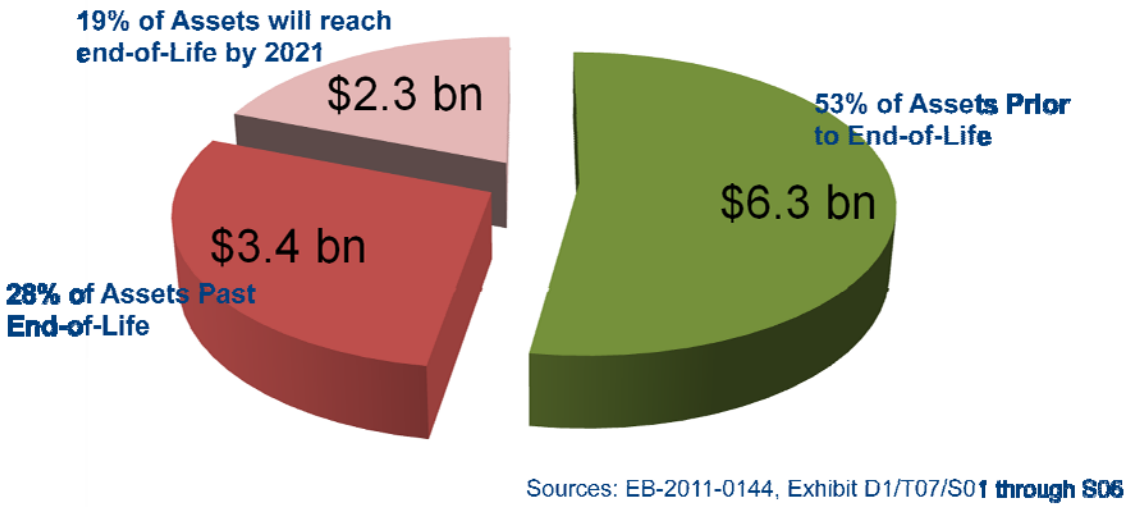
- THESL is faced with an asset base that is clearly in need of renewal;
- The replacement of the asset base will occur over a long period of time;
- The replacement of the asset base will require successive capital budget approvals from the Board in an order of magnitude that is three to five times of THESL's current and forecast levels of depreciation; and

[3] See Exhibit R1-T1-S2. See also Exhibits D1-T7-S5, D1-T17-S1 and D1-T8-S1 (Table 1).
[4] See Exhibits D1-T7-S5 and D1-T7-S6.
[5] See Exhibits A1-T2-S1 (p. 4-10), and R1-T3-S3.
[6] EB-2009-0139 and EB-2010-0142.
[7] See Exhibit A1-T2-S1, p. 24, 28-33. See also Exhibits D1-T7-S4, D1-T7-S5 and D1-T7-S6 (Electricity Distribution Capital Plan). Also, past rate filings include EB-2010-0142 (Ex. D1-T8-S11-1, and D1-T8-S11), EB-2009-0139 (Q1-T02-S01, Q1-T03-S01) and EB-2007-0680 (D1-T08-S09).

- Such capital budgets simply cannot be accommodated under IRM as it is currently constructed.

To assist the Board and intervenors I have prepared figure "a" below which shows the asset age assessment of THESL's plant. Figure "a" shows that over one-quarter of THESL's distribution plan is already past its useful life ($3.4 billion), and a further 19% ($2.2 billion) will be past its useful life within ten years. In other words, approximately half of THESL's plant will need to be replaced in the next 10 years.

Figure "a"



Q5. What is the best way to manage a long-term program of capital renewal such as THESL's?

A5. Keeping in mind the practicality of being able to finance the incremental capital expenditures, which Mr. Couillard discusses in his witness statement, I would like to begin to answer this question by first responding in the negative: a start-stop approach is

not the best way to manage a long-term capital renewal program such as THESL's. In fact, doing so would be financially wasteful and inefficient.

For example, THESL employs large contractor resources to carry out its renewal program.[8] As infrastructure renewal is necessary throughout the entire (Ontario and Canadian) economy, if THESL terminates these resources by stopping its capital program, it stands to reason that it will be more expensive to regain and retrain those resources. Similarly, THESL's own workforce cannot be expected to remain available if steady work is not offered, and the customers would lose the investment made over at least the last five years in THESL's trade school program. In other words, because of the financial pressures which arise from IRM, THESL will be unable to refresh its workforce as older workers retire, and its own workforce will, out of necessity, shrink.[9]

Further, arresting an infrastructure renewal program does not arrest the deterioration of that infrastructure and the need for its replacement. In practical terms, and as I describe in further detail below, were THESL to be placed on IRM, THESL's capital program would virtually grind to a halt. This arises from the very construct of the (3GIRM) IRM formula, which obligates the utility to fund capital expenditures to a threshold level over base year depreciation. However, for a utility that is operating at its deemed capital ratios, financing capital work above depreciation is imprudent because this would automatically lower the utility's allowable return and negatively affect other key financial ratios. Therefore, in THESL's case, required capital spending above depreciation would simply not be carried out during the "IRM period". Conversely, were THESL to opt to continue to spend the required amount of capital on its distribution system, the accumulated addition to ratebase (approximately $1.6 billion, plus the expected amount of capital required in 2015 of approximately $660 million)[10] that would be placed in the

[8] See Exhibit C2-T1-S5.
[9] See Exhibits R1-T2-S4 and R1-T6-S5. For further details regarding the predictable downsizing in THESL's workforce under IRM, please see A8 on p. 11 below.
[10] This figure is based on the "gap" between what THESL has filed as its capital ask in 2012, 2013 and 2014 in EB-2011-0144, plus the effect of the half-year rule from the 2011 Board-approved ratebase, and

next rebasing year would lead to unacceptably high rate impacts to customers. In the result, it is highly unlikely that the rebasing year capital plan would be approved in the size required, and THESL's capital program would lag even further.[11]

Finally, where end-of-life (or past end-of-life) equipment is not replaced, service disruptions increase – both in frequency and duration, as do the costs of emergency repairs to failing equipment.

By contrast, a steady, continuous program of infrastructure renewal will be far more efficient and cost-effective, as well as minimize the likelihood of rate shock to customers.[12] Further, offering steady employment to its own employees and contractors will allow THESL to attract and retain the necessary labour skills. And finally, a substantial steady program of replacing end-of-life infrastructure is necessary to mitigate the service disruptions and costs of reactive and emergency repairs to failing equipment. For example, even though THESL has ramped-up its infrastructure replacement program since 2008, that program has so far been insufficient to altogether halt the trend of increasing reactive and emergency repair costs.[13]

Now, much has said about how the IRM mechanism incentivizes utilities to continually improve productivity. Here too, though, the current IRM formula takes a very parochial view of productivity improvements by applying a narrow productivity factor into the mechanistic formula. However, productivity gains for a utility can result from at least three areas: (i) by doing the same amount of work with fewer resources; (ii) by doing more work can be done with existing resources; and (iii) if a lot more work is done with a non-proportional increase in resources. As a practical matter, given THESL's cresting

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the Board approved level of depreciation in 2011 of approximately $140 million (which would remain effectively fixed over the IRM period).

[11] See Exhibit A1-T2-S1, p. 21-23, and 27-28. See also Exhibits D1-T17-S1 and D1-T8-S1 (Table 1).

[12] As discussed in further detail below (A8), THESL estimates that where the company is on IRM for four years, and capital "catch-up" occurred in the first year that THESL was no longer on IRM, the corresponding rate impact of IRM may be as high as approximately 43% from the required capital budget alone.

[13] See Exhibits R1-T5-S5 and R1-T6-S5. See also Exhibit F1-T2-S1.

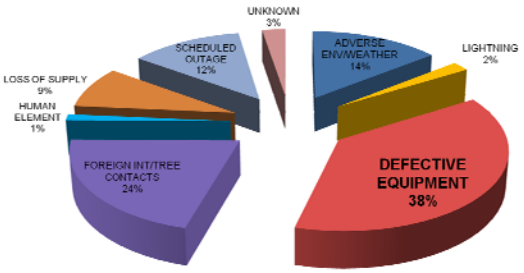
retirements and significant capital needs, the utility is in the third category of needing to do a lot more work with a non-proportionate increase in resources. This simply underscores the nature of infrastructure investments which are "cost-lumpy" when they are necessitated, and in THESL's case, such infrastructure needs are coinciding with its aging human resources who *will* leave. Accordingly, and as has been illustrated in Mr. McLorg's evidence, the current IRM formula simply does not accommodate these circumstances.

To assist the Board and intervenors, I have prepared figure "b" to illustrate the challenges and circumstances faced by THESL regarding outages and the way in which this underscores THESL's aging infrastructure. Figure "b" shows the causes of the number of outages (SAIFI) and the length of outages (SAIDI). In both cases, the defective equipment category is the largest.

Figure "b"

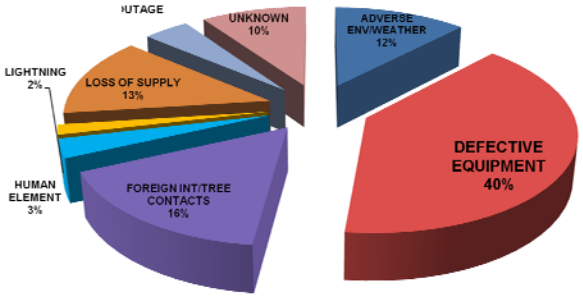
Defective equipment is the main driver of the number and length of outages, and underscores the need to replace aging infrastructure

SAIDI



Source: EB-2011-0144/D1/T07/S03; page 11 of 37

SAIFI



Source: EB-2011-0144/D1/T07/S03; page 10 of 37

Q6. What are the consequences to THESL regarding capital renewal if it is put on the Incentive Regulation Mechanism Price Cap Index ("IRM-PCI")?

A6. If THESL were placed on IRM-PCI, we estimate that instead of spending approximately $400-640 million a year,[14] THESL would have approximately $140 million per year for all capital projects (i.e. not just sustaining or replacement capital).[15] In such a case, IRM is likely to not even allow THESL to satisfy the bare reactive investments that the distribution system requires. Since those costs are inescapable, such a scenario would leave nothing for sustaining capital. This in turn leads to escalating maintenance costs.[16]

To assist the Board and intervenors I have prepared figure "c" to illustrate the difference between THESL's actual capital needs and the amount that THESL would be approved to spend on capital projects under IRM.

[14] As discussed above and below, the Board granted THESL an approximately $400 million capital budget in each of the last two years, and THESL's projected capital needs in the next three years are $590 million (2012), $615 million (2013) and $640 million (2014). See Exhibit D1-T8-S1, (Table 1).
[15] See Exhibits A1-T2-S1, p. 24, 28-33 and R1-T-S1.
[16] See Exhibits A1-T2-S1 (p. 30-33), R1-T1-S1 (p. 2-4), RI-T1-S3 (p.3), and R1-T2-S4. See also Exhibit D1-T8-S1 (Table 1).

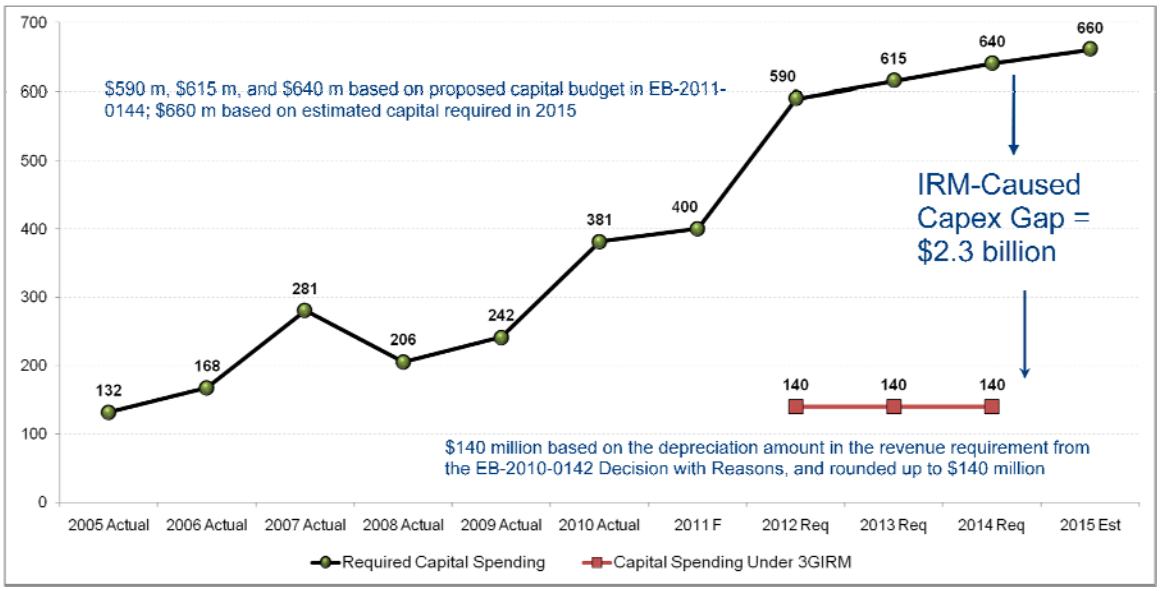


Figure "c"

The consequences of a limit of this nature on THESL's capital spending would also mean that THESL's ability to replace aging infrastructure is completely constrained. Based on today's installed costs, and actual assets in service, THESL estimates that replacement of the entire distribution plant amounts to approximately $12 billion. Even if one simply takes THESL's 2011 approved fixed assets, and applies conservative inflation for the past 30 years, the resulting replacement cost is over $10 billion. In any event, the replacement cost of THESL's assets is a very big number. THESL estimates that the 47% of assets that are either already past their useful life or will be within 10 years (as shown in figure "a") have a replacement cost of over $5 billion. Were THESL only allowed to spend $140 million on <u>total</u> capital (i.e., not just sustaining capital) it would take THESL over 41-years to replace these assets. Further, using the same logic, it would take approximately 97 years to replace the entire distribution plant, which is a completely untenable proposition, but one which is precisely what obtains under IRM for THESL. Given that the average life of THESL's distribution assets is approximately 30 years, not

only would IRM-PCI mean that THESL's asset replacement cycle is moving in the wrong direction, but that it would accelerate in that wrong direction.[17]

Q7. Does IRM-PCI create a tension between THESL's duties as a distributor and its right to be afforded an opportunity to earn a fair return?

A7. Yes, for THESL, IRM-PCI creates a fundamental tension between THESL's duties as a distributor and its right to have the opportunity to earn its allowed fair return. Given the circumstances that I have just described, if THESL was put onto IRM, making the capital investments that are required in order to provide customers with safe, reliable and responsive distribution services would effectively deny THESL the opportunity to earn its allowed fair return.[18]

While Mr. Couillard speaks further to financial matters in his witness statement, I will note here that in such a case, THESL would be effectively required to spend more on capital than the amount that arises from the IRM formula. However, if THESL spends more on capital than it is approved for, then it not only jeopardizes the utility's ability to earn a fair return, but also its ability to finance incremental CAPEX in public debt markets in a manner that is cost-effective for ratepayers. Also, because THESL's parent company, Toronto Hydro Corporation, already has approximately $1.3 billion in publicly issued debt (most of which was placed on behalf of THESL), any overspending on CAPEX by THESL will lead to a markedly weaker financial position for the company. This would in turn have negative credit rating consequences for the company with respect to its overall debt covenants. This is an unacceptable and untenable position for the company, and one that would obligate THESL to only spend up to its allowed depreciation expense.[19]

[17] See Exhibits D1-T6-S4 (Table 4), D1-T7-S5 (p.3-46) and D1-T7-S6 (p.22-51).
[18] See Exhibits A1-T2-S1 (p. 27-33), R1-T1-S3 and R1-T7-S8.
[19] See Exhibits A1-T2-S1 (p. 27-33), R1-T1-S3, R1-T2-S2 and R1-T2-S15. See also Exhibit E1-T6-S2.

By contrast, a steady and stable program of investment would allow THESL to manage its capital financing in the most efficient and cost-effective way and avoid rating downgrades, which will increase the cost of capital. A steady program of investment will also allow THESL to gradually reduce the backlog of infrastructure needing replacement and bring the system to a sustainable, steady-state condition.[20]

Q8. What could happen if THESL did not spend more than the Board-approved amount for IRM-PCI allowed over the four-year IRM period?

A8. If THESL capped its spending at the Board-approved IRM-PCI amount, in addition to the restrictions on THESL's capital expenditures, the company would be faced with the very real matter of essentially going into "survival mode".[21] On the operations-side, this would entail: [22]

- terminating substantially all of THESL's contractors;
- laying off a substantial portion of THESL's workforce, between approximately three and four hundred employees. Laying off full-time employees would cost THESL approximately $30 to $40 million in severance payments and $5 to $10 million in retraining of existing employees;[23]
- being left with a workforce where the average age is within 5 years of retirement, because of collective agreement "bumping rights";[24]
- incurring several tens of million dollars in reorganization costs; and
- a massive negative effect on service to customers, such as increased outages as I describe below.

[20] See Exhibits R1-T5-S5 and R1-T6-S5.
[21] See Exhibit A1-T2-S1, p. 29-33.
[22] See Exhibits A1-T2-S1 (p. 24-25), R1-T1-S1 (p. 3-5), RI-T1-S3 (p. 3) and R1-T2-S4. See also Exhibit C2-T1-S2 and D1-T7-S5.
[23] These figures are based on THESL's estimates that per annum salary for each laid-off employee is approximately $100,000.
[24] THESL estimates that under this scenario the company would be left with a workforce of approximately 150 and 200 qualified tradespersons.

As I noted above, it is well documented before the Board that THESL's infrastructure is already aging and failing at a faster rate than THESL has been able to keep up with, despite its investment of approximately $400 million in each of the last 2 years. For example, forty feeders in the last thirty six months went into the worst performing feeder pool.[26] This situation only deteriorates under IRM: approximately 200,000 customers will experience regular outages in the next four years once a month and for an increasingly longer time each outage.[27]

On this scenario, assuming THESL emerges from IRM at the end of four years, we expect that it will need approximately $1.6 billion in CAPEX to "catch up" on its capital renewal program.[28] Of note, the $1.6 billion excludes the capital expenditures that would be required in 2015 (approximately $660 million), the addition of which would bring the total capital required to approximately $2.2 billion. If such catch-up occurred in the first year that THESL was no longer on IRM, it would have a corresponding rate impact of approximately 43% from the required capital budget alone.[29] As I discuss above, there would also be increases to THESL's operating budget, and this would further add to the rate shock. Clearly, this is an untenable situation.

As summarized above, quite apart from the direct effect that emerging from IRM would have on ratepayers however, THESL would be in the position of having an insufficient workforce and few-to-no contactors to do the capital work required, as well as no ability to efficiently raise capital. In short, the company would be severely financially challenged for an extended period of time, and the distribution system would be being maintained at unacceptable service levels.

[26] See Exhibit D1-T7-S5, p. 55.
[27] See figure "c" above. As noted in that figure, the defective equipment is the main driver of the number and length of outages.
[28] See Exhibit A1-T2-S1, p. 23. See also Exhibit D1-T8-S1 (Table 1). $1.6 billion is based on THESL's projected capital needs of $590 million (2012), $615 million (2013) and $640 million (2014), plus the effect of the half-year rule from the 2011 Board-approved ratebase (which would be held constant over the IRM period).
[29] THESL estimates that for every $53 million incremental capital expenditures, there is a 1% increase in distribution rates.

Q9. Is there anything else that you would like to add in conclusion?

A9. THESL needs stable access to growing resources to accomplish the necessary infrastructure renewal at least cost.[30] In short:

(a) apart from relatively small sources of other income (all of which go into revenue offsets), distribution revenue requirement is the only source of funding available to THESL;

(b) infrastructure replacement necessarily means growing ratebase and revenue requirement, and that is not available to THESL under IRM; and

(c) if the Board accepts that it is in the public interest to facilitate essential infrastructure renewal and it is THESL's responsibility to do so, and that IRM will not provide the resources necessary for this outcome, then THESL must be permitted to hearing on its full Cost of Service application. In THESL's circumstances, IRM would produce rates that are not just and reasonable and therefore IRM should not be imposed on THESL at this time.

As the CEO of THESL, I have a duty to our customers, to our employees and to other stakeholders, including our bondholders, to seek the rates necessary to ensure that the company can meet its obligations to them.

Customers deserve a reasonable level of service – we must improve service in some areas of Toronto where reliability is poor, and maintain service in those areas where it is reliable. Everywhere, we must continue to ensure that our system is safe and efficient.

Our employees deserve a safe and secure work environment, the tools and equipment necessary to perform their jobs and competitive compensation and benefits consistent with their employment agreements.

[30] See Exhibit A1-T2-S1, p. 28-29, and 30-33.

Finally, THESL's shareholder is entitled to the opportunity to earn a fair return, and its bondholders are entitled to be repaid their principal and interest in full and on time in accordance with the terms and conditions that THESL has agreed to (including the debt to total capitalization/equity ratios), and which the Board has explicitly allowed.

By not granting THESL the opportunity to present its complete Cost of Service application to the Board at a hearing, the Board will effectively be saying that THESL only needs approximately $140 million per year in capital, even though it has approved $400 million in the past based on the evidence THESL presented and the Board accepted last year (and such evidence outlined THESL's current and ongoing need in this regard).

I believe that the issue at this stage of the proceeding is a simple one: will the Board allow Toronto Hydro an opportunity to demonstrate that its proposed capital investments and spending are necessary and appropriate and in the public interest?

While we believe that the costs presented in THESL's application are fully justified, we respectfully appreciate that this is ultimately a matter for the Board to decide. At this point we are only asking that THESL be allowed to be heard and to make its case on the basis of the full evidentiary record before the Board.

Q1. Mr. Couillard, you are Chief Financial Officer for Toronto Hydro-Electric System Limited?

A1. Yes.

Q2. What is the purpose of your testimony today?

A2. I will answer this question in part, by reference to the witness statements of Mr. McLorg and Mr. Haines.

Mr. McLorg has set out for the Ontario Energy Board (the "Board") that:

(a) there is a class of utilities who face certain structural costs pressures which cannot be accommodated under 3rd Generation Incentive Regulation Mechanism ("IRM"); and

(b) for those utilities described in (a), IRM creates a structural deficit in allowed revenue requirement that would be severely problematic for those utilities and their customers.

Mr. Haines has summarized the central reasons why THESL is unable to manage its resources and financial needs under IRM. In particular, he has described the way in which Toronto Hydro-Electric System Limited ("THESL") faces exactly these circumstances that Mr. McLorg described in his witness statement.

I will address certain financial matters that are relevant to the circumstances that Mr. Haines has addressed.[1]

[1] In general, the portions of the evidence that this witness statement is based on can be found at Exhibit A1-T2-S1 (p. 2-10 and 21-33 in particular), as well as THESL's interrogatory responses. Specific and additional references are provided below for convenience, including references to certain exhibits that, while themselves are not the subject of examination during this Preliminary Issue phase of the proceeding, may be of assistance to intervenors and the Board pursuant to Procedural Order No. 3.

Q3. What specific topics will you address?

A3. I will discuss in general terms certain financial matters that are relevant to the way in which THESL faces the circumstances that Mr. McLorg and Mr. Haines describe. In particular, I will address the following:

(a) the cost pressures on THESL that would flow from the imposition of the 3rd Generation Incentive Rate Mechanism ("IRM");
(b) the effects of a credit-rating downgrade on THESL (that would likely occur as a result of the imposition of IRM); and
(c) (c) the specific effects that IRM would have on THESL's ability to earn its fair return.

Q4. What are the cost pressures that would be put on THESL as a result of the imposition of IRM?

A4. The cost pressures that would flow from the implementation of IRM, in the face of THESL's clear and on-going urgent need to replace large portions of the distribution system,[2] will place an untenable financial burden on the company should the company to continue to spend CAPEX dollars consistent with the amount and order of magnitude that the Board approved in 2009, 2010 and 2011, and which is the bare minimum of what THESL needs to spend on its distribution system annually. Under these circumstances a credit downgrade is very likely.[3]

Q5. What are the effects of credit-rating downgrade on THESL that could occur as a result of the imposition of IRM?

A5. Under IRM**,** financing incremental capital in debt capital markets will be problematic due to the confluence of the following events. First, THESL will be placed

[2] This has been repeatedly filed in evidence, including most recently in this proceeding: see Exhibit D1-T7-S1 (through S6).
[3] See Exhibits A1-T2-S1 (p. 4-10, 23-33), R1-T1-S3, R1-T2-S2.

in the unfortunate situation of having to borrow long-term capital without explicit regulatory approvals, thereby placing an unacceptably high financing and regulatory risk on the company as the prudence of the capital spend will only be determined years later.

Second, as Standard and Poor's has noted on page 4 in Exhibit E1-T06-S02, continuing to spend on capital absent explicit regulatory approvals will lead to negative ratings consequences. Negative ratings consequences would result because the company's leverage ratios would increase to unacceptably high levels since the incremental capital would not be in ratebase.[4] Additionally, the effects of a credit rating downgrade will not be limited to THESL's cost of long-term debt (even if it could access debt in these circumstances), but will also automatically increase interest costs on the company's short-term working capital liquidity lines, which are priced in reference to a credit rating grid.

Third, depending on the extent of the credit rating downgrade, there could be a significant increase in THESL's prudential requirements with the IESO which would further increase short-term interest costs. Eventually, these largely unnecessary costs will need to be borne by ratepayers. This is an unacceptable and untenable financial position for the company and for its customers.

These aspects would obligate me to recommend to Mr. Haines and to our Board of Directors that all necessary steps should be taken to cut the capital program to a level commensurate with the Board-approved depreciation expense, which is currently approximately $140 million.

[4] See Exhibits A1-T2-S1 (p. 4-10, 23-33), R1-T1-S3, R1-T2-S2.

Q6. What are the specific effects that IRM would have on THESL's ability to earn its fair return?

A6. On the one hand, were THESL to continue to make the capital investments that are required in order to provide customers with a safe, reliable and responsive distribution services, THESL would forego its ability to earn a fair return. The effects of incremental capital spending would be manifested in very short order in the reduction to accounting ROE that would exceed the Board's off-ramp threshold of 300 basis points.[5] Of course, and as I have noted above, there are sound financial reasons and financial market-based reasons why THESL either will not spend on incremental capital or will be unable to access debt capital to pay for the needed incremental capital.

Further, even if THESL could finance the incremental capital, the predictable result would be a reduction in accounting ROE, which would trigger an IRM off-ramp application for early rebasing that would necessarily end any expectation that THESL would remain under the IRM-PCI framework for several years. This means that the utility would permanently forego the lost depreciation and ROE that it would sustain in the interim (between rebasings), and would predictably prevent THESL from earning the Board-approved ROE.[6]

An illustration of the effects on THESL's return metrics was included at page 28 of A1-T1-S2 in THESL's evidence, and is reproduced here:[7]

[5] See Exhibits A1-T2-S1 (p. 27-30), R1-T1-S3, R1-T2-S15, R1-T3-S5 and R1-T5-S3.
[6] See Exhibits A1-T2-S1 (p. 29-30), R1-T1-S3, R1-T2-S15, R1-T3-S5 and R1-T5-S3.
[7] THESL discovered that the original version of this table contained minor inaccuracies. This table was accordingly corrected by virtue of THESL's response to interrogatories at Exhibit R1-T3-S5. The corrected version of this table appears here.

Table 5: ROE Consequences of IRM-PCI (corrected)

	2011 Approved	2012	2013	2014
Equity Returns under PCI BDRR	$88,068,069	~~$52,441,342~~ $52,435,771	~~$5,456,501~~ $5,437,489	~~$(47,784,377)~~ $(47,783,358)
Proposed ROE	9.58%	9.58%	9.58%	9.58%
ROE under PCI BDRR	9.58%	4.97%	0.45%	(3.41%)
Proposed Effective PILs Rate	13.39%	1.52%	5.27%	NA
PILs	$11,791,223	$2,012,755	$402,763	0

In short, and as detailed further in the evidence of Mr. Haines, the gap between the system resource needs, on the one hand, and the financial resources available under IRM, on the other, is too large for THESL to be able to prudently manage its needs under IRM for 2012, 2013 and 2014.

Q1. Mr. McLorg, you are the Manager, Regulatory Policy and Relations of Toronto Hydro-Electric System Limited?

A1. Yes.

Q2. Mr. McLorg, what is the purpose of this Witness Statement on the Preliminary Issue?

A2. I will address and explain THESL's view that there are certain structural cost pressures that utilities may face, that arise from a combination of their obligations as distributors and the Board's protocols around ratemaking, that cannot be accommodated under IRM as it is presently exists. As a result, the imposition of IRM, on utilities that are in certain circumstances that I will describe, would create a structural deficit in allowed revenue that would be severely problematic for those utilities and their customers.

Q3. What specific topics will you address?

A3. Generally, I will discuss the different types or sources of growth in revenue requirement; whether and how costs in different categories are susceptible to the productivity improvements that underpin the design of IRM; how infrastructure and workforce renewal create structural cost pressures, including a discussion of the effects of historical cost ratemaking, depreciation, and capital contributions; whether and how IRM can accommodate different structural cost pressures; and how the application of IRM in specified circumstances creates a structural deficit in revenue requirement.

Q4. Please summarize the evidence in this Witness Statement.

A4. In summary, this evidence demonstrates that:

- while IRM may function as anticipated in certain circumstances, there is a class of utilities who face certain structural costs pressures which cannot be accommodated under the mathematical formula embodied in IRM;
- these structural cost pressures arise as a result of factors that are inherent in the ratemaking process, such as the historical cost basis for recognizing ratebase and depreciation, and the operation of capital contributions, combined with the obligations of the utility to continue to provide safe, reliable electricity distribution service;
- these structural cost increases can be moderated, but not eliminated, by productivity improvements;
- while a limited number of discrete projects in THESL's capital plan might quality for ICM treatment, they would be exceptions – the majority of THESL's capital program is composed of routine, core-business requirements of a distributor;
- the result of applying IRM as the method of ratemaking to utilities in these circumstances is the creation of a structural deficit between the revenues required by the utility to carry out its responsibilities, and the revenue available under the IRM-PCI framework; and
- the structural deficit in turn places the utility in the untenable position of having to severely curtail investment in infrastructure renewal in order to maintain financial viability - this directly and materially harms the interests of customers in the quality and reliability of electrical service.

Q5. As a further preliminary question, does the structural deficit you mention occur in all cases where IRM is applied?

A5. No. In THESL's view, it occurs to a significant degree when utilities have to replace infrastructure extensively, provide for workforce renewal, and experience low or

negative load growth, but these are not circumstances faced by every distributor in Ontario.

Q6. Please explain then the different sources of growth in revenue requirement you referred to.

A6. THESL distinguishes two major categories of cost growth. These are inflationary cost growth and structural cost growth.

Inflationary cost growth occurs as a result of inflation in the ordinary course. Although the relative prices of goods and services are constantly shifting in the economy, a rise in the general or average price level constitutes inflation. For utilities, inflation is experienced in the prices of supplies and services purchased by the utility from outside sources, the costs of internal labour, and in items such as taxes and fees that are payable by the utility.

Revenue requirement and rates are of course expressed in current or nominal dollars, and as inflation proceeds, the purchasing power of nominal dollars declines. Under IRM, the Board has provided the inflation factor within the Price Cap Index, or PCI, to compensate utilities for the effects of inflation on their nominal costs. Assuming that the inflation factor accurately compensates utilities for actual inflation, and assuming that other cost pressures are absent, a utility's rates could rise at the same rate as inflation without there being any increase (or decrease) in "real", or inflation adjusted, rates.

Q7. Please explain then what is meant by structural cost growth.

A7. Structural cost growth occurs for a number of reasons which I will address, but generally it refers to growth in the real, or resource, cost of providing service to customers, as reflected in revenue requirement. In other words, structural cost growth is growth in cost that is not due to general inflation and which would occur even if actual inflation were zero. It is cost growth in "real" terms.

Q8. What are the sources of structural cost growth for utilities?

A8. Considered first with respect to the absolute level of revenue requirement itself, structural cost growth is defined as a real, or non-inflationary increase in revenue requirement. Such increases are caused by a number of different factors, principally including system expansion, growing customer numbers, replacement of existing infrastructure at end-of-life, transitory increases in the number of employees for purposes of workforce renewal, and growth in the scope of service required to be provided to customers. These factors in turn require greater resources in order to provide that service to customers.

It is important though that not all of these factors entail a proportional increase in rates. System expansion is typically accompanied by growth in load and the number of customers, which generate new revenues, and it also typically attracts capital contributions. New distribution revenues and capital contributions diminish the effect on rates of the corresponding system expansion.

Q9. Do all utilities experience these structural cost pressures, and do they do so to the same degree?

A9. THESL cannot speak in detail about the circumstances of other utilities in Ontario. However, THESL believes on the basis of its communications and publicly available data that some of these structural cost pressures are shared by most utilities, while others are not.

THESL believes that the demographic forces underlying the need for workforce renewal apply broadly to all or most distributors and indeed throughout the economy. With respect to other factors though, such as the need to replace end-of-life infrastructure and the rates of load and customer growth, even neighbouring utilities can be in very different circumstances depending on the vintage of their infrastructure and the different characteristics of their service areas.

Q10. Please explain how those latter factors could be different.

A10. In its response to Board Staff interrogatory 2, at Exhibit R1, Tab 1, Schedule 2, THESL explains in detail and with examples how neighbouring utilities can exhibit different system vintages and growth rates. In summary, as urban and suburban development occurs in different areas over decades, some service areas will reach relative saturation or maturity at different times than others, and at a given moment in time this leads to conditions where utilities could have quite different rates of growth and average system ages, even though the general pattern of utility evolution could be quite similar across utilities.

Q11. Please explain THESL's views that some kinds of costs are susceptible to productivity improvements while others are not.

A11. This stems from the fact that the productivity of existing resources is generally subject to ongoing improvements, and those improvements can lead to cost reductions or the avoidance of costs that would otherwise be necessary. However, when it becomes necessary to add resources to meet obligations, after having achieved productivity improvements over existing resources so as to minimize the need for additional resources, those incremental resources generally cannot be added without incurring the corresponding incremental cost.

To take just two concrete examples, consider a situation where a particular feeder has reached end-of-life and must be replaced. Certainly the manner and efficiency with which THESL would secure the materials and perform the capital work to replace the feeder are areas where there are ongoing efforts to improve productivity. These would include things such as acquiring the materials at competitive costs; organizing the work process and crews efficiently; coordinating electrical work with planned work that other (telephone and gas) utilities are undertaking; and in some cases improving the technical efficiency of the system by converting the voltage level of the feeder. So in all those

kinds of ways, THESL continuously strives to improve the efficiency of its execution of capital projects.

However, THESL cannot avoid the fact that the new feeder will enter ratebase and revenue requirement at higher costs than the feeder being replaced. The replaced feeder is likely to be fully, or nearly fully depreciated, and as such, it creates zero or minimal capital-related revenue requirement. As a result, simply to maintain connection to the same existing loads and customers, costs in revenue requirement must increase and that increase cannot be subject to productivity improvements itself. Stated differently, the level of the incremental cost is subject to productivity improvements, but after those are achieved, the fact of the remaining cost increase cannot be. Ratebase cannot be increased while return remains constant.

Similarly, labour productivity can be and has been improved at THESL, for example through the implementation of Mobile Work Management. But after those productivity enhancements are exhausted, and it is still necessary to increase the number of employees for example to bring apprentices into the workforce, their incremental wages represent a new cost that is not subject to productivity improvement. The number of employees cannot increase while the total labour bill remains constant.

Q12. How do these facts affect the applicability of IRM?

A12. IRM is founded on the assumption that utility costs are subject to productivity improvements, and for ratemaking purposes, the rate of productivity improvement is assumed to be not less than the sum of the productivity factor and the stretch factor. THESL's observation is simply that while some costs are susceptible to productivity improvements, other structural cost increases, which can be significant for utilities in certain circumstances, are not. It is a mistake to assume that a utility's entire revenue requirement is subject to productivity growth.

Q13. Earlier you mentioned that structural cost growth arises in part as a result of ratemaking protocols. What are those protocols and how do they create structural cost growth?

A13. I will begin by noting that all of this discussion is with reference to ratebase and revenue requirement. Although that may seem obvious, there is in fact a difference between the total capital employed by a utility to provide service and the amount of that capital reflected in ratebase at any moment.

Generally with respect to capital, the protocols of interest here are that ratebase and depreciation are reflected in terms of the historical cost of acquisition, or the installed cost of capital equipment. When a utility project is completed and closed to ratebase, the addition to ratebase is stated at the nominal cost actually incurred by the utility, at that time in then-current dollars. Similarly, depreciation is calculated based on that historical acquisition cost.

THESL does not dispute the use of historical cost for ratemaking purposes, and this approach is widely adopted throughout North America by utility regulators. However, because much of the capital used by utilities has long lives, in the order of 40 to 60 years, and because utility distribution systems also evolve over decades, one result of this approach is that ratebase at any moment in time is really an amalgam of costs incurred over many decades. In addition, ratebase calculated on this basis does not reflect the effect of inflation of many decades. A feeder installed in 1960 attracts capital-related costs in revenue requirement in terms of 1960 dollars, not 2011 dollars.

Q14. Is THESL saying that the use of historical cost for ratemaking is somehow unfair to utilities?

A14. No, not per se. Over the lifetime of the equipment, the utility recovers both the capital invested, through depreciation, and the cost of that capital, through return.

Q15. How then do these protocols give rise to structural cost pressures?

A15. While the equipment in question is in service, the structural cost pressures do not arise. In fact, the capital-related costs attracted by the asset decline over the entire lifetime of the equipment, and if the asset in fact lasts longer than the period of depreciation, then during that period of 'excess life', so to speak, the asset provides service without imposing any capital-related cost in revenue requirement.

By saying this, THESL does not discount the facts that maintenance costs for the asset typically increase toward the end-of-life of the asset, and that those costs are reflected in revenue requirement.

Nevertheless, the problem with capital-related structural cost pressure does not arise while the equipment is in service. It arises when the asset has to be replaced.

Looking at those circumstances, in which (say) a 50 year old asset has to be replaced, even despite significant technological advancements and productivity improvements, the capital cost in current dollars simply has to be significantly greater than the amount of capital reflected in ratebase and revenue requirement for the asset which is being replaced.

Simply as a matter of ratemaking arithmetic, the historical cost approach has to give rise to significant increases in revenue requirement when old equipment is replaced, because by definition, historical cost ratemaking does not account for replacement cost, under the assumption that revenue requirement remains constant.

Looked at from a slightly different perspective, the depreciation in revenue requirement is historical cost depreciation, not replacement cost depreciation. As a result, it follows arithmetically that depreciation expense in current revenue requirement is insufficient to maintain a mature distribution system in a sustainable, steady-state condition.

Q16. How do capital contributions affect these structural cost pressures?

A16. The effect of capital contributions in this context is really to create a larger difference between the physical capital used by the utility to provide service and the level of capital reflected in ratebase and revenue requirement. Over the life of the contributed capital, the equipment is used to provide service to customers but it attracts no capital-related revenue requirement costs. Like the factors discussed above, this does not become problematic until it is time to replace the capital in question.

However, at that time the same structural cost pressures ensue as they do in the case with equipment that has been substantially or fully depreciated. That contributed equipment, which has never attracted any capital-related revenue requirement, must be replaced with equipment that is installed at current costs and attracts a significant capital-related revenue requirement. It is arithmetically unavoidable that ratebase and revenue requirement must increase under these circumstances.

The main effect then of contributed capital in this context is to enlarge the base of assets for which a strong differential revenue requirement comes into existence at the time of replacement.

Q17. Overall then, is THESL critical of the Board's use of these ratemaking protocols?

A17. No. THESL believes, and anticipates that most parties would agree, that historical cost ratemaking and capital contributions have served to minimize revenue requirement, and the growth in revenue requirement stemming from customer additions, in a fair manner that has kept all parties whole. With respect to capital contributions, those costs have essentially migrated out of the electricity system per se and have become embedded in real estate prices. Clearly it would be inappropriate for utilities to also collect depreciation and return on contributed capital.

Nevertheless, the life of distribution equipment, while long, is finite. However that equipment was initially provided, by capital contribution or otherwise, the time comes when it must be replaced. Electricity distributors are clearly responsible for the replacement of that equipment, and equally clearly, they have not been compensated throughout history on a 'replacement cost' basis.

Therefore, it would be inconsistent for the Board now to hold that although distributors have the responsibility to replace that equipment, the costs of that replacement will not be allowed in revenue requirement, or to impose a system of regulation that predictably does not provide for the necessary increases in revenue requirement for the purpose of infrastructure renewal.

Q18. Turning now to one of the other sources of structural growth in revenue requirement, please explain how workforce renewal creates such an effect.

A18. In some respects workforce renewal is analogous to infrastructure renewal. In the same sense that ratebase cannot be increased without increasing revenue requirement, incremental employees cannot be hired without increasing the total labour bill, and whether the labour is capitalized or expensed, revenue requirement must increase commensurately.

This is not to say that THESL should not be responsible to take steps to improve labour productivity in order to minimize the number of new positions required, and indeed THESL does that. However, certain demands for increased labour exist independently of achievable improvements in labour productivity, and a principal one of these demands arises because THESL has to train apprentices over multiple years to take over for retiring workers. The number of incremental positions necessary, and the costs for training are matters for examination and determination in a rate case, but to the degree that it is found that incremental positions are necessary, it is not possible to simply divide

the existing total cost of labour among more workers in order to maintain revenue requirement at a constant level.

Q19. Is it possible that growth in load and the number of customers can offset the structural increase in revenue requirement stemming from these various causes?

A19. As noted earlier, to address this it is necessary to distinguish revenue requirement from rates.

Growth in customer numbers and load do not act to offset the increase in revenue requirement, and in fact can be principal causes of such growth. However, such growth is accompanied by new revenues, and may be funded to a significant degree by capital contributions. Furthermore, growth in customer numbers and load creates a larger base over which to spread fixed and quasi-fixed costs. All these factors act to mitigate or possibly eliminate the need for an increase in rates to recover the larger revenue requirement.

Q20. What is the effect if customer and load growth are low or even negative?

A20. Those conditions would be characteristic of a utility with a mature service territory, as contrasted to one with a growing service territory.

In reality of course most utilities experience some degree of customer growth, although the same cannot be said for load growth, which can be positive or negative. Furthermore most utilities would have some requirement for infrastructure renewal, as equipment that was originally installed decades ago comes to end-of-life.

The question is really one of which effects are predominant. For a mature utility, which may in fact be adjacent to a growing utility, needs for infrastructure renewal may come to dominate the total need for capital expenditures. In that case the capital expenditures to replace already-existing equipment may generate little or no additional load or customers

and thus not generate new revenue; the new assets may not attract any capital contributions to defray the total project costs since connections already exist; and the new equipment may replace existing equipment which contributes little to the existing revenue requirement.

When those conditions and requirements come to be dominant or even significant, the imposition of IRM creates a structural deficit in revenue requirement.

Q21. Please summarize then how this occurs.

A21. The first effects become manifest in the year following rebasing. Assuming that the utility is carrying out its duty to reinvest in the system, at a minimum to the degree necessary to prevent grid health from further deteriorating, it will necessarily be making capital expenditures in excess of depreciation in the rebasing year. Similarly, it may be hiring for net new positions such that the year-end count of employees is greater than the average count across the rebasing year. In both these cases, the rebasing year revenue requirement will be less than that of the following year, even if ratebase and employee count in the following year are held constant at opening balance levels.

In the first PCI year, growth in revenues in real terms could be negligible, zero, or negative depending on growth in load and customers, assuming that actual inflation was just compensated by the inflation factor, and that actual productivity increases in areas where that was possible offset the sum of the productivity and stretch factors.

However, even under those assumptions, the underlying cost growth for the system would continue unabated. The deterioration of the assets would continue as would the departure of skilled members of the workforce. Hence while revenue requirement in real terms grows, allowed revenues remain essentially static. As a result a structural deficit is created between required revenue and allowed revenue, which would continue and worsen over the duration of the IRM period. The revenue required by the utility to carry out its responsibilities would be denied by the imposition of the PCI methodology of

revenue determination, and the utility would be faced with an untenable choice between meeting its duties as a distributor and maintaining its financial viability.

Q22. Could the structural deficit you describe be eliminated or reduced by the Incremental Capital Module?

A22. No. While a limited number of discrete projects in THESL's capital plan might qualify for ICM treatment, they would be the exceptions. The majority of THESL's capital program is composed of routine, core-business requirements of a distributor: customer connection, infrastructure renewal, and other capital for customer services and distribution support. These expenditures are clearly not extraordinary, and the Board has clearly stated that the ICM was not intended for, and does not apply in, these circumstances.

Q23. Finally Mr. McLorg, given all that you have described in this Witness Statement, the evidence that has been pre-filed, and THESL's interrogatory responses, is it THESL's view that its particular circumstances could be addressed by THESL returning to the Board each year with an 'early rebasing' application?

A23. No, it is not. Repeated, successive early rebasing applications would defeat the purpose of the Board's IRM framework, create significant regulatory burden, and put THESL in a perpetual state of uncertainty with respect to its ongoing operations.

As stated in THESL's response to VECC IR #2, "It is not possible for THESL to conduct its business responsibly while planning for dramatically different business condition scenarios that would exist as alternatives for the same period." And as explained in THESL's response to Board Staff IR # 1, the differences between the COS framework and the IRM framework are real and material in terms of THESL' operational plans.

Furthermore, the circumstances in which THESL operates are not expected to change year over year, and the logic of ratemaking is not expected to change year over year. The

issues faced by the Board, THESL, and other parties with respect to THESL's revenue requirement will not change in character year over year for the foreseeable future. Therefore, successive, repetitive early rebasing applications depart from the Board's intention for early rebasing applications and would impose significant and unnecessary regulatory burden on all parties.

In THESL's respectful submission, the best balance currently available between regulatory efficiency, and fairly meeting the needs of THESL and its customers, is for the Board to adopt a multi-year COS framework for the purposes of regulating THESL.

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EDUCATION:

- University of Lethbridge (1983)
- Bachelor of Commerce
- Prerequisite program for admission into the Institute of Chartered Accounting

BUSINESS EXPERIENCE:

- **Toronto Hydro Corporation**
  October 2009 to present – President and Chief Executive Officer
- **Toronto Hydro-Electric System Limited**
  September 2006 to present – President
- **Toronto Hydro Corporation**
  May 2005 – September 2006, Chief Administrative Officer
- **Hydro Ottawa Limited**
  2003 – 2005, Chief Operating Officer
- **Enlogix Inc. (Westcoast Energy Inc.)**
  1998 – 2003, President & CEO
- **Union Gas (Westcoast Energy Inc.)**
  1996 – 1998, Vice-President of Strategic Planning
- **Centra Gas British Columbia Inc. (Westcoast Energy Inc.)**
  1994-1995, Vice-President of Strategic Planning, Regulatory Affairs, Gas Supply, and IT
  1992 – 1993, Director of Strategic Planning and Regulatory Affairs
  1989 – 1991, Manager of Strategic Planning
- **ICG Resources Ltd.**
  1985 – 1988, Chief Accountant

- **Coopers & Lybrand**

  1983 – 1984, Articling Student

REGULATORY APPEARANCES:

Witness before OEB:

- Toronto Hydro-Electric System Limited's 2008 to 2010 Electricity Distribution Rates Applications (EB-2007-0680)
- Toronto Hydro-Electric System Limited's 2006 Electricity Distribution Rate Application (EB-2005-0421)

Witness before the BCUC:

- 1990 – 1996 Various procedures

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EDUCATION:

- Canadian Institute of Chartered Accountants, Chartered Accountant Designation, September 1996
- École des Hautes Études Commerciales of Montréal, Bachelor in Business and Administration, December 1994

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- Institute of Chartered Accountants of Québec
- Institute of Chartered Accountants of Ontario

BUSINESS EXPERIENCE:

- Toronto Hydro Corporation
  - Chief Financial Officer (November 2004 to present)
  - Vice-President, Finance (April-November 2004)
- Toronto Hydro Energy Services
  - Vice-President, Finance and Operations (March 2002-March 2004)
- Group Telecom
  - Director of Business Operations – Central Region (March 2001-February 2002)
  - Group Telecom, Director of Corporate Financial Analysis (January 2000-February 2001)
- Ernst & Young LLP
  - Audit Manager and Supervising Senior Auditor (May 1993-March 1999)

REGULATORY APPEARANCES:

- Ontario Energy Board
    - EB-2009-0139 THESL's 2010 Electricity Distribution Rate Application, February 2010
    - EB-2010-0180 to -0183, Toronto Hydro Streetlighting Applications, November 2009
    - EB-2009-0243, THESL's Application for Recovery of Contact Voltage Remediation Costs, October 2009
    - EB-2007-0680, THESL's 2008 Electricity Distribution Rates Application
    - EB-2005-0421, THESL's 2006 Electricity Distribution Rates Application
    - Transition Costs, September 2004

CURRICULUM VITAE OF
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EDUCATION:

- 1986, Master of Arts, Economics, University of Waterloo
- 1983, Bachelor of Arts, Honours Economics (Philosophy Minor), University of Waterloo

BUSINESS EXPERIENCE:

- Toronto Hydro-Electric System Limited
  - August 2006-Present, Manager, Regulatory Policy & Relations (Regulatory Affairs)
- Ontario Energy Board
  - July 2005-July 2006, Manager, Electricity Rate Applications (Applications)
- Toronto Hydro Corporation
  - January 2000-July 2005, Regulatory Specialist; Senior Advisor (Regulatory Affairs)
- Enbridge Consumers Gas
  - July 1997-January 2000, Senior Analyst; Manager, Business Intelligence (Strategic Planning)
  - July 1995-July 1997, Manager, Rate Design (Regulatory Affairs)
  - 1992–1995, Senior Integrated Resource Planning Analyst (Regulatory Studies)
  - 1989–1992, Conservation Analyst, Senior Conservation Analyst (Economic Studies)

- ICG Utilities (Ontario) Ltd.
    - 1987–1989, Intermediate Regulatory Analyst; Senior Economic Analyst; Supervisor Economic Forecasting (Budgets and Forecasts)
- University of Waterloo
    - 1986 – 1987, Course instructor and research assistant

RECENT REGULATORY APPEARANCES:

- Ontario Energy Board
    - EB-2010-0142, THESL's 2011 Electricity Distribution Rate Application, March 2010
    - EB-2009-0139, THESL's 2010 Electricity Distribution Rate Application, February 2010
    - EB-2009-0308, THESL Suite Metering Compliance, January 2010
    - EB-2009-0243, THESL's Application for Recovery of Contact Voltage Remediation Costs, October 2009
    - EB-2009-0069, THESL's 2009 Electricity Distribution Rate Application, March 2009
    - EB-2008-0381, 1562 PILs, January 2009
    - EB-2008-0150, Issues related to Low Income energy consumers, September 2008
    - EB-2007-0680, THESL's 2008 Electricity Distribution Rate Application, December 2007-January 2008
    - EB-2007-0096, THESL's CDM Recovery Application, June 2007
    - EB-2007-0063, Smart Meter Combined Proceeding, June 2007