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March 6, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges – Undertaking Responses and Un-Redacted 2014 Financial Results
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Further to my letter dated March 5, 2015, please find enclosed the responses to Oral Hearing Undertakings J8.11 and J9.2. All the undertaking responses have now been filed.

Also enclosed are un-redacted versions of the 2014 financial results filed at Exhibit OH, Tab 1, Schedules 3 and 5. These documents were filed confidentially on February 22 and 25, respectively.

Please contact me if you have any questions.

Yours truly,

[original signed by]

Daliana Coban
Lead Regulatory Counsel
Toronto Hydro-Electric System Limited
regulatoryaffairs@torontohydro.com

encl.:DC\acc

cc: Charles Keizer, Torys LLP
Crawford Smith, Torys LLP
Amanda Klein, Toronto Hydro
Intervenors of Record for EB-2014-0116

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March 5, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges – Undertaking Responses
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Further to my letter dated March 3, 2015, please find enclosed the responses to Oral Hearing Undertakings J9.1 and J9.3 to J9.6. Responses for J8.11 and J9.2 will be submitted tomorrow.

Toronto Hydro's response to the Letters of Comments received in this Application is also enclosed.

Please contact me if you have any questions.

Yours truly,

[original signed by]

Daliana Coban
Lead Regulatory Counsel
Toronto Hydro-Electric System Limited
regulatoryaffairs@torontohydro.com

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cc: Charles Keizer, Torys LLP
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Intervenors of Record for EB-2014-0116

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March 2, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges – Undertaking Responses
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Further to my letter dated February 27, 2015, enclosed are the following responses from Days 6, 7 and 8 of the Oral Hearings:

- J6.4;
- J7.1, J7.2, J7.3, J7.9, J7.10, J7.11; and
- J8.1 to J8.10.

Also enclosed is an updated response to J1.1 and an excel file (labelled Appendix B) which is part of the response to J6.4. The response to J8.11 will be filed together with the Undertaking Responses for Day 9 on March 4, 2015.

Please contact me if you have any questions.

Yours truly,

[original signed by]

Daliana Coban
Lead Regulatory Counsel
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cc: Charles Keizer, Torys LLP
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Intervenors of Record for EB-2014-0116

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February 27, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges – Undertaking Responses
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Further to my letter dated February 26, 2015, enclosed are the following responses from Days 3, 6 and 7 of the Oral Hearings:

- J6.1, J6.2 and J7.5 – OEB Staff;
- J7.1 – VECC; and
- J3.1, J7.4, J7.6, J7.7 and J7.8 – SEC.

The responses for J6.4, J7.1-J7.3 and J7.9-J7.11 will be provided on March 2, 2015 together with the responses for the Day 8 Undertakings.

Please contact me if you have any questions.

Yours truly,

[original signed by]

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cc: Charles Keizer, Torys LLP
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Intervenors of Record for EB-2014-0116

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February 26, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges – Undertaking Responses
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Further to my letter dated February 25, 2015, enclosed are the following responses from Day 6, February 25, 2015 of the Oral Hearing:

- J6.3 – Energy Probe;
- J6.5 and J6.6 – School Energy Coalition; and
- J6.7 – OEB Staff.

Responses to Undertakings J6.1 and J6.2 from OEB Staff and J6.4 from Energy Probe will be provided on February 27, 2015. Also included is a corrected response to Undertaking J5.2 – Energy Probe with the correction marked with a /C.

Please contact me if you have any questions.

Yours truly,

[original signed by]

Daliana Coban
Lead Regulatory Counsel
Toronto Hydro-Electric System Limited
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cc: Charles Keizer, Torys LLP
Crawford Smith, Torys LLP
Amanda Klein, Toronto Hydro
Intervenors of Record for EB-2014-0116

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February 25, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges – Undertaking Responses
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Further to my letter dated February 24, 2015, enclosed are the following responses from Day 5, February 24, 2015 of the Oral Hearing:

- J5.1 – Energy Probe;
- J5.2 – Energy Probe; and
- J5.3 – Energy Probe.

Please contact me if you have any questions.

Yours truly,

[original signed by]

Daliana Coban
Lead Regulatory Counsel
Toronto Hydro-Electric System Limited
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cc: Charles Keizer, Torys LLP
Crawford Smith, Torys LLP
Amanda Klein, Toronto Hydro
Intervenors of Record for EB-2014-0116

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February 24, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges – Undertaking Responses
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Further to my letter dated February 23, 2015, enclosed is a response to Oral Hearing Undertaking J4.5 – CCC. In addition, Toronto Hydro is filing a response to AMPCO's questions from Day 1 of the Oral Hearing re SCADA-Mate R1 units.[1] This response is being filed as Exhibit OH, Tab 1, Schedule 4.

Please contact me if you have any questions.

Yours truly,

[original signed by]

Daliana Coban
Lead Regulatory Counsel
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cc: Charles Keizer, Torys LLP
Crawford Smith, Torys LLP
Amanda Klein, Toronto Hydro
Intervenors of Record for EB-2014-0116

[1] EB-2014-0116, Transcript Volume 1 (February 17, 2015) at pages 95-100.

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February 23, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges – Undertaking Responses
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Further to my letter dated February 20, 2015 enclosed are the following responses:

- Day 2, February 19 Undertakings: J2.3 – Energy Probe; J2.4 – CCC (redacted);
- Day 3, February 20 Undertaking J3.5 – OEB Staff; and
- Day 4, February 23 Undertakings: J4.1 – AMPCO; J4.2 – AMPCO; J4.3 – AMPCO; J4.4 – SEC.

Under separate cover, Toronto Hydro is filing its complete response to Undertaking J2.4 confidentially.

Please contact me if you have any questions.

Yours truly,

[original signed by]

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Lead Regulatory Counsel
Toronto Hydro-Electric System Limited
regulatoryaffairs@torontohydro.com

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cc: Charles Keizer, Torys LLP
Crawford Smith, Torys LLP
Amanda Klein, Toronto Hydro
Intervenors of Record for EB-2014-0116

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February 20, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges – Undertaking Responses
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Further to my letter dated February 18, 2015 enclosed are the following responses:

- Day 1, February 18 Undertaking: J1.5 – AMPCO; and
- Day 2, February 20 Undertaking: J2.1 – Energy Probe.

Responses to Undertakings J2.2 and J2.3, from Energy Probe, will be answered by members of Panel 1 at their next scheduled appearance. The response to Undertaking J2.4 from CCC will be filed on Monday, February 23, 2015.

Please contact me if you have any questions.

Yours truly,

[original signed by]

Daliana Coban
Lead Regulatory Counsel
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regulatoryaffairs@torontohydro.com

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cc: Charles Keizer, Torys LLP
Crawford Smith, Torys LLP
Amanda Klein, Toronto Hydro
Intervenors of Record for EB-2014-0116

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February 18, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges – Oral Hearing, Day 1 – Undertaking Responses
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Enclosed are the following responses to Undertakings issued on Day 1 of the Oral Hearing:

- J1.1 – CUPE Local One; and
- J1.4 – AMPCO.

Responses to J1.2 and J1.3, from CUPE and AMPCO respectively, will be answered by members of Panel 3 as noted on page 40 lines 18-22 of Volume 1 of the Oral Hearing Transcript. The response to J1.5 from AMPCO will be provided on Friday, February 20.

Please contact me if you have any questions.

Yours truly,

[original signed by]

Daliana Coban
Lead Regulatory Counsel
Toronto Hydro-Electric System Limited
regulatoryaffairs@torontohydro.com

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cc: Charles Keizer, Torys LLP
Crawford Smith, Torys LLP
Amanda Klein, Toronto Hydro
Intervenors of Record for EB-2014-0116

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February 26, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges – Confidential Response to Undertaking OH J6.6
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Toronto Hydro requests confidential treatment of its response to the Oral Hearing Undertaking J6.6 on the basis that this response contains commercially sensitive information about the Enterprise Resource Planning project (Exhibit 2B, Section E8.6). Toronto Hydro notes that the OEB accepted at Day 6 of the Oral Hearing that this information could be filed on a confidential basis.[1]

Please do not hesitate to contact me if you have any questions.

Yours truly,

[original signed by]

Daliana Coban
Lead Regulatory Counsel
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regulatoryaffairs@torontohydro.com

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cc: Charles Keizer, Torys LLP
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Amanda Klein, Toronto Hydro
Intervenors of Record for EB-2014-0116

[1] EB-2014-0116, Transcript Volume 6 (February 25, 2015) at page 129, lines 2-12.

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February 24, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro")
Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges (the "Application") – Updated Response to Undertaking OH J2.4-CCC
OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

As noted by Mr. Keizer at the onset of Day 5 of the Oral Hearing,[1] Toronto Hydro is filing an updated response to Undertaking OH J2.4-CCC. The enclosed response includes the utility's 2014 financial KPI results. Toronto Hydro requests confidential treatment of this information for the same reasons outlined in utility's February 23, 2015 letter with respect to the original response to Undertaking OH J2.4-CCC.

In addition, Toronto Hydro notes that the 2014 financial KPI results contained within the updated response represent forward looking financial information. Confidential treatment of this type information was granted by the OEB by way of an oral ruling at Day 5 of the Oral Hearing, with respect to the utility's 2014 financial results contained in Exhibit OH, Tab 1, Schedule 3, Attachments 2 and 3.[2]

[1] EB-2014-0116, Transcript Volume 5 (February 24, 2015) at pages 1-2.
[2] EB-2014-0116, Transcript Volume 5 (February 24, 2015) at pages 83-84.

Yours truly,

[original signed by]

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cc: Charles Keizer and Crawford Smith
Maureen Helt
Ted Antonopoulos
Martin Davies
Intervenors of Record for EB-2014-0116

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February 23, 2015

via RESS – signed original to follow by courier

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

Dear Ms. Walli:

Re: Toronto Hydro-Electric System Limited ("Toronto Hydro") Custom Incentive Rate-setting Application for 2015-2019 Electricity Distribution Rates and Charges (the "Application") – Confidentiality Request re: 2014 Performance Results OEB File No. EB-2014-0116

Toronto Hydro writes to the Ontario Energy Board ("OEB") in respect of the above-noted matter.

Toronto Hydro requests confidential treatment of the 2014 Key Performance Indicator (KPI) results contained in its response to the Oral Hearing Undertaking OH-J2.4-CCC. The company's 2014 performance results determine the variable performance pay that eligible employees will receive for their contributions in 2014. These results are not disclosed throughout the organization until they are final. They are not final until they have been reviewed and approved by the Board of Directors, at the end of the first quarter in 2015. The variable performance pay-out to eligible employees in the company follows this approval. Public disclosure of the information in advance of review and approval by the Board of Directors could lead employees to form inaccurate expectations about their variable performance pay for the year. Therefore, Toronto Hydro respectfully submits that this information should be granted confidential treatment.

In addition, Toronto Hydro notes that the 2014 financial KPI results cannot be provided at this time because the year-end financial closeout and audit verification process in currently underway. The company's financial results will not be publicly disclosed until they have been reviewed and approved by the Board of Directors, at the end of the first quarter in 2015.

Please do not hesitate to contact me if you have any questions.

Yours truly,

[original signed by]

Daliana Coban
Lead Regulatory Counsel
Toronto Hydro-Electric System Limited
regulatoryaffairs@torontohydro.com

:encl.

:DC\db

cc: Charles Keizer and Crawford Smith
Maureen Helt
Ted Antonopoulos
Martin Davies
Intervenors of Record for EB-2014-0116

ORAL HEARING UNDERTAKING RESPONSE TO CANADIAN UNION OF PUBLIC EMPLOYEES, LOCAL ONE

UNDERTAKING NO. J1.1:

Reference(s):

Please look into whether THESL tracks critical accidents, injuries, and workplace health and safety issues for externally contracted services with respect to the contractors identified in the evidence.

RESPONSE:

Toronto Hydro has various systems and processes in place that verify the design and construction contractors' compliance with internal and external safety standards, and track critical accidents, injuries, and workplace health and safety issues as they arise. These include Initial and Ongoing Third-Party Qualification Reviews, Internal Quarterly Contractor Reviews, Comprehensive Third-Party Inspections and Contractor Incident Notification framework. All of which are described below.

Toronto Hydro notes that the costs associated with contractor non-compliance with legislative and/or contractual safety requirements, as well as the costs of safety-related incidents (if any) caused by contractor staff are borne by the outside contractors themselves and have no bearing on the utility's actual costs.

1. Initial and On-Going Third Party Qualification Reviews.

Independent third party assessments of contractors' past safety performance, confirmation of contractors' insurance / workplace compensation coverage meeting all internal and external requirement, and legislative compliance verification of the

ORAL HEARING UNDERTAKING RESPONSE TO CANADIAN UNION OF PUBLIC EMPLOYEES, LOCAL ONE

contractors' safety policies and procedures. Following initial verification, these assessments are performed on a regular basis.

2. Internal Quarterly Contractor Reviews

Quarterly internal reviews of contractor safety performance based on the following seven criteria:

1) Registration with OHSAS 18001
2) WSIB Performance Index (CAD7 and NEER statements)
3) Safety professional staffing ratio (one safety professional/70 workers)
4) Supervisor and management inspections
5) Safety incident investigations completion timing
6) Continuous improvement in safety incident rates
7) Notices of violation, orders, or other written infractions from regulatory agencies

3. Third Party Inspections

Comprehensive daily inspections by a third-party construction verification and audit firm (SNC Lavalin) that review the quality of contractors' work, verify adherence to contractual terms and include review of safety compliance among other assessment categories.

4. Contractor Incident Notification and Reporting

Mandatory notification to Toronto Hydro of any safety incidents reportable to an outside agency (e.g., Ministry of Labour), including reporting of critical injuries and results of investigations/corrective actions conducted following an incident.

ORAL HEARING UNDERTAKING RESPONSE TO CANADIAN UNION OF PUBLIC EMPLOYEES, LOCAL ONE

Several contractor firms employed by Toronto Hydro are certified to OHSAS 18001 – an internationally recognized safety management system traceable to the Standards Council of Canada. More generally, the average Total Recordable Injury Frequency (TRIF) value for all external design and construction firms in 2014 was 1.22, which is better than Toronto Hydro's own average TRIF performance over the 2012-2014 timeframe. **/C**

ORAL HEARING UNDERTAKING RESPONSE TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO

UNDERTAKING NO. J1.4:

Reference(s):

To confirm that the trend in spending between 2010-2014 is approximately 20% greater than the amount approved by the Board.

RESPONSE:

Aggregate capital spending for the years 2010 through 2014 is approximately 19.3% greater than the amount approved by the OEB for those years.[1] At the Oral Hearing, Mr. Walker explained why capital spending sometimes exceeds OEB-approved amounts:[2]

> During the course of any given year, there are things that emerge that need to be addressed for reliability purposes, for safety purposes. One example was stray voltage. When we determined that there were situations where we had stray voltage on some of our electrical plant, we had to undertake to deal with that. So there are things that emerge that have to be addressed and, you know, it is part of our obligation to serve our customers. And if that means we have to overspend, then that's what we will do.

Please refer to Toronto Hydro's response to interrogatory 2A-VECC-8 for a detailed explanation of the 2011 capital spending above the OEB-approved amounts. Over the 2012 to 2014 period, capital spending above OEB-approved amounts included prudent work completed in segments that were deemed ineligible for ICM funding, such as

[1] This figure is based on the updated forecast of 2014 capital spend related to the Copeland TS project, which was filed on February 6, 2015.
[2] EB-2014-0116, THESL Volume 1 (February 17, 2015) at page 78, lines 13 to 23.

ORAL HEARING UNDERTAKING RESPONSE TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO

Operations Portfolio Capital, Hydro One Capital Contributions and Feeder Automation as well as other necessary work undertaken during those years.

ORAL HEARING UNDERTAKING RESPONSE TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO

UNDERTAKING NO. J1.5:

Reference(s):

To indicate where in the Evidence asset condition information may be found.

RESPONSE:

Information about the condition of Toronto Hydro's assets is presented in Exhibit 2B, Section D, Appendix A, which is the Toronto-Hydro-Electric System Limited 2014 Asset Condition Assessment Audit prepared by Kinetrics Inc.

As shown in Exhibit 2B, Section D1, Figure 2, page 6, asset condition assessment is one of the tools Toronto Hydro uses as an input into its planning process. As discussed in Exhibit 2B, Section D3.2.1, pages 16-18, the asset condition assessment is used to create health indices for the various asset classes shown in Figure 6 of that section. Specifically, the information on asset condition is used to produce an outlook of the asset population's condition and highlight trends in that condition to support project planning.

However, asset condition is not the primary driver of Toronto Hydro's asset renewal program. As explained in response to interrogatory 1B-BOMA-31(b) with regard to the Feeder Investment Model, age-based failure probabilities are the primary driver of projected asset failures, with condition based assessment used "only if the condition-based result exceeds the baseline failure probability produced from the age-based calculation". As 1B-BOMA-31(b) goes on to explain, "where an asset is experiencing an accelerated failure rate due to its condition, the Health Index and condition-based failure probability calculations are applied to increase the probability of failure". Moreover,

ORAL HEARING UNDERTAKING RESPONSE TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO

asset condition assessment information may not be comprehensive because information may only be available for certain conditions that impact asset performance.

Toronto Hydro's approach reflects the reality that as assets reach and then exceed their useful lives, their probability of failure increases regardless of their known condition. In other words, assets at or beyond their useful lives are more likely to fail, even if they appear to be in good condition, but assets that are both at or beyond their useful and in poor condition are that much more likely to fail. For this reason, asset condition assessment information, where available, is used to help prioritize capital work.

As an example, the power transformers scheduled for replacement in 2015 are all at or beyond their useful lives and in fair or poor condition as shown in Table 1 below. Note that this excludes one 2015 project for which the scope of work involves installation of an oil containment system rather than installation of a new transformer. As noted in Exhibit 2B, Section E6.14, Table 5, page 23-24 (the source of Table 1 below), the power transformers shown as being in fair condition have specific issues that support their immediate replacement.

ORAL HEARING UNDERTAKING RESPONSE TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO

1 **Table 1: Assets for renewal identified in the Power Transformer Program for 2015**

Asset (Power Transformer)	Age (As of 2014)	Past Useful Life (Y/N)	Health Index	HI Grade	Optimal Intervention Time (Feeder Investment Model)
Blaketon MS Transformer TR1	45	Y (At Useful Life)	67	Fair Condition	0
High Level MS Transformer TR2	68	Y	48	Poor Condition	0
Coronation Bennett MS Transformer TR1	58	Y	36	Poor Condition	0
Norseman MS Transformer TR1	58	Y	59	Fair Condition	0

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

UNDERTAKING NO. J2.1:

Reference(s): CEA Report, 2A-EP-8 part (d)

To provide a comparison of the five-year average on page 39 of the CEA report for SAIDI and SAIFI to the five-year averages for Canadian urban utilities.

RESPONSE:

The benchmarking presented on page 39 of the CEA report for 2013 has SAIDI and SAIFI for Canadian Urban Utilities. Page 37 details the exact utilities considered as part of this urban group.

Before doing a comparison, it is important to understand what the data in the CEA report represents and how it relates to Toronto Hydro's reliability data. Page 39 of the CEA report outlines SAIDI and SAIFI of "Urban Utilities" for 2013, 2012 and a five-year historical average. This data includes Major Event Days (or Most Prominent Events by CEA definition), Significant Events (large events that affect the national reliability metrics) and Loss of Supply. The data presented in 2A-EP-8, page 4 excludes Major Event Days by Toronto Hydro definition as well as Loss of Supply and Significant Events. Therefore, the CEA metrics on page 39 are not comparable to the averages shown on page 4 of 2A-EP-8.

The following figure compares Toronto Hydro's five-year (2009-2013) SAIDI and SAIFI averages calculated on the same basis as the average on page 39 of the referenced CEA report.

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

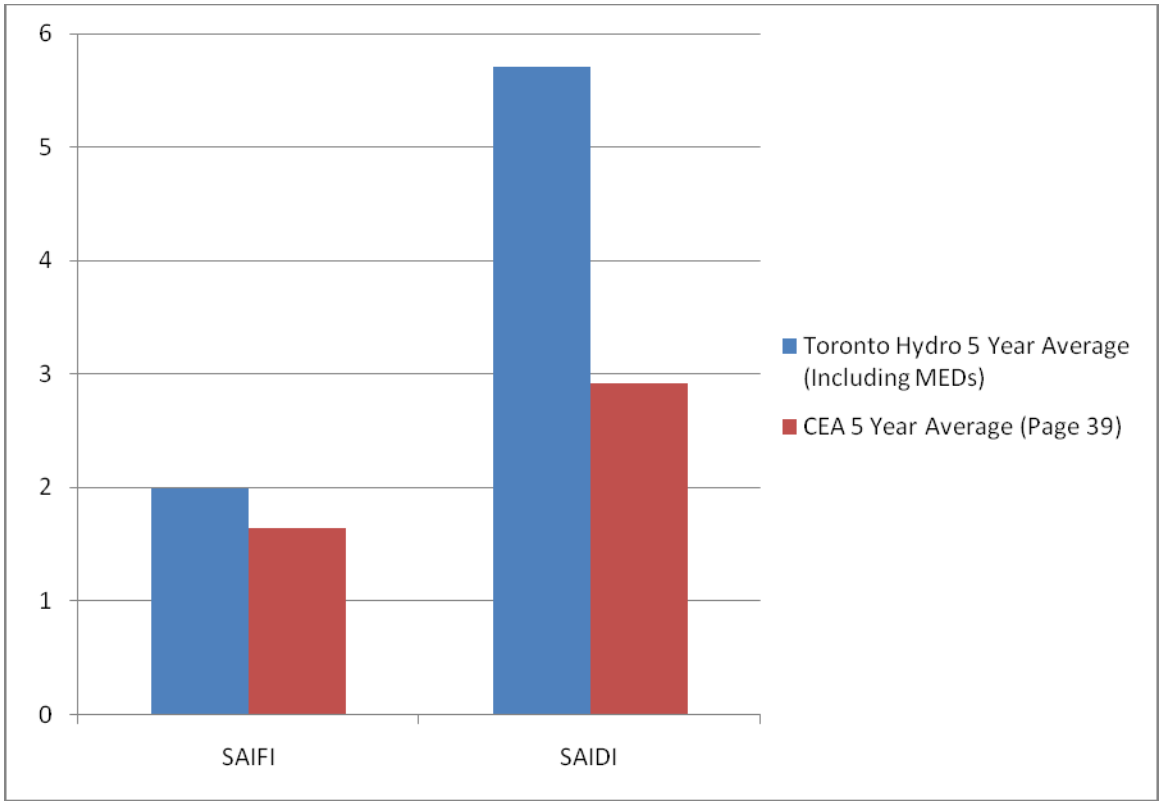


Figure 1: Comparison of CEA Five-Year SAIDI and SAIFI Average (2009-2013) to Five-Year THESL Average (Including MEDs)

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

UNDERTAKING NO. J2.3:

Reference(s):

To reconcile projections from TC J1.2-EP-52, page 3, 2A-EP-8 part c, Exhibit 2B-Figures 3 and 4.

RESPONSE:

1) TC J1.2-EP-52, page 3 – SAIDI and SAFI projections exclude Loss of Supply:

	2014 Forecast	2015 Projection	2016 Projection	2017 Projection	2018 Projection	2019 Projection
SAIFI	1.31	1.39	1.28	1.20	1.11	1.03
SAIDI	0.97	1.16	1.10	1.05	1.01	0.95

2) 2A-EP-8(c) – SAIDI and SAFI projections exclude Loss of Supply (identical to J1.2-EP-52, page 3):

	2014F	2015P	2016P	2017P	2018P	2019P
SAIFI	1.31	1.39	1.28	1.20	1.11	1.03
SAIDI	0.97	1.16	1.10	1.05	1.01	0.95

3) Exhibit 2B Sch00, Figures 3 and 4 – the SAIDI and SAFI projection for the proposed CIR period include Loss of Supply:

		2014	2015	2016	2017	2018	2019
SAIDI	Run To Fail	1.21	1.26	1.31	1.37	1.43	1.50
	Proposed CIR		1.23	1.17	1.12	1.08	1.02
SAIFI	Run To Fail	1.53	1.67	1.74	1.81	1.90	1.99
	Proposed CIR		1.55	1.44	1.36	1.27	1.19

ORAL HEARING UNDERTAKING RESPONSE TO CONSUMERS COUNCIL OF CANADA

UNDERTAKING NO. J2.4:

Reference(s):

To review which of the key performance indicators for 2014 have been finalized and in respect of those, to produce the final number, and to provide 2015 numbers if available.

RESPONSE:

Toronto Hydro's preliminary 2014 Key Performance Indicator (KPI) results and 2015 KPI targets are reproduced below. The 2014 results for the Net Income, Productivity: OPEX and THESL Regulated Capital measures are not available at this time, as this information has not yet been audited. However, Toronto Hydro expects these results to exceed target. Further, and as discussed on pp. 98-99 of the Day 2 Oral Hearing transcript, all 2014 KPI results are preliminary until they receive approval from the utility's Board of Directors, expected in March of 2015.

2014 Key Performance Indicator Results: Corporate Scorecard

KPI	2014 Target	2014 Result
Enhanced Customer Engagement	214,000	[redacted]
First Call Resolution	78%	[redacted]
Safety: Total Recordable Injury Frequency	2.58	[redacted]
Attendance	5.75	[redacted]
SAIFI	1.53	[redacted]
SAIDI	72.50	[redacted]
Key Accounts: Worst Performing Feeders	49	[redacted]
Productivity: Fleet Utilization (units)	663	[redacted]
Productivity: Facilities – Occupied Square Footage Reduction	3,930	[redacted]

ORAL HEARING UNDERTAKING RESPONSE TO CONSUMERS COUNCIL OF CANADA

KPI	2014 Target	2014 Result
Productivity: Operating Expenses ($M)	$260.2	[redacted]
Net Income ($M)	$103.6	[redacted]
THESL Regulated Capital	$395.0	[redacted]

1 **2015 Key Performance Indicator Measures and Targets: Corporate Scorecard**

KPI	2015 Target
Enhanced Customer Engagement	245,000
First Call Resolution	81%
Safety: Total Recordable Injury Frequency	1.80
Attendance	4.50
SAIFI	1.50
SAIDI	68.00
Key Accounts: Worst Performing Feeders[1]	14.00
Productivity: Operating Expenses ($M)	$275.6
Net Income ($M)	$100.1
THESL Regulated Capital	$436.6

[1] Unlike the 2014 Key Accounts Worst Performing Feeders KPI, the 2015 measure includes sustained interruptions only.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J3.1:

Reference(s):

To identify reasons for and quantify the difference in benchmark increases in the custom IR period versus the 12-year period prior to custom IR.

RESPONSE (Prepared by PSE):

As Mr. Fenrick indicated during the hearing, the primary drivers of the growth rate in the total cost benchmarks are inflation (capital input price and OM&A input price) and output growth (customers and peak demand). Other "outputs" that would increase costs such as reliability or safety improvement are not captured within the econometric total cost benchmarking framework.

Mr. Shepherd indicated two time periods for examination in this undertaking, 2002-2014 and 2015-2019. The primary differences in the cost benchmark growth rates during these two time periods are driven by the fact that the expected capital input price inflation is predicted to be higher in the custom IR period than during the historic years of 2002-2014 and measured outputs (customers and peak demand) are expected to increase more rapidly during the 2015-2019 period than the historic 2002-2014 time period. The capital input price was influenced by declining interest rates during the historic time period which is not forecasted to continue into the custom IR years.

Other variables will have a slight impact on the growth rates but the differences in those growth rates between time periods are negligible. The table below provides the estimates of the primary variables driving the cost benchmark growth rates. PSE notes that these are close approximations rather than exact impact estimates.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

Time Period	PSE Reply Benchmark Average Annual Growth Rate	Contribution to the Average Annual Growth Rate*			
		Capital Price	OM&A Price	Customers	Peak Demand
2002-2014	2.7%	0.7%	0.9%	0.6%	0.1%
2015-2019	5.4%	2.7%	1.0%	1.1%	0.4%
Difference Between Periods	2.7%	2.0%	0.0%	0.5%	0.3%

*The table does not display the contribution to the growth rates from the trend variables and other variables with minor (< 0.1%) impact on the rate. As a result the numbers may not add.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. J3.5:

Reference(s):

To provide bad debt expenses that were excluded from THESL's model.

RESPONSE:

The following table contains the expenditures excluded from Toronto Hydro's total cost definition for the 2013-2019 period by way of the Adjustment #1 described on pages 4-5 of PSE's Reply Report (Exhibit 1B, Tab 2, Schedule 5, Appendix C). As stated in the PSE Reply Report, in addition to the Bad Debt expenses, the adjustment also includes Property Taxes[1], which PSE understands are also excluded from PEG's total cost definition.[2]

2013	$ 13,949,680
2014	$ 13,618,369
2015	$ 14,555,582
2016	$ 14,759,360
2017	$ 14,965,991
2018	$ 15,175,515
2019	$ 15,387,972

[1] Exhibit 1B, Tab 2, Schedule 5, Appendix C, at page 4, section 3.1.
[2] The adjustment amounts also include the Low-Income Energy Assistance Program (LEAP) funding, which was not explicitly referenced in the PSE Reply given the immaterial nature of this expenditure category.

ORAL HEARING UNDERTAKING RESPONSE TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO

UNDERTAKING NO. J4.1:

Reference(s):

To provide the Board-approved CAPEX numbers for 2006 and 2007.

RESPONSE:

The 2006 OEB-approved CAPEX budget was $203.2M inclusive of Smart Meters.[1] There was no specific OEB-Approved CAPEX budget for 2007 because rates for that year were established based on the OEB's IRM formula.

[1] EB-2005-0421, Decision With Reasons (April 12, 2006) at page 9.

ORAL HEARING UNDERTAKING RESPONSE TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO

UNDERTAKING NO. J4.2:

Reference(s):

Provide a breakdown for 2009 to 2014 of the table that was provided in response to 2B-AMPCO-21.

RESPONSE:

Please see the following further breakdown of the defective equipment for the years 2009-2014.

SAIFI	2009	2010	2011	2012	2013	2014
Underground Cables	35%	30%	42%	44%	49%	34%
Switches	15%	20%	14%	20%	11%	23%
Poles and Pole Hardware	23%	30%	20%	14%	16%	18%
Others	8%	4%	4%	10%	7%	9%
Transformers	6%	6%	7%	2%	4%	7%
Stations Equipment	3%	2%	5%	5%	4%	4%
Overhead Conductors	10%	8%	6%	5%	9%	4%

SAIDI	2009	2010	2011	2012	2013	2014
Underground Cables	37%	40%	42%	36%	43%	38%
Poles and Pole Hardware	24%	21%	20%	12%	20%	19%
Switches	10%	15%	13%	14%	5%	14%
Others	7%	4%	2%	9%	10%	9%
Stations Equipment	7%	2%	7%	20%	6%	8%
Transformers	6%	10%	9%	6%	9%	7%
Overhead Conductors	9%	9%	6%	3%	7%	5%

ORAL HEARING UNDERTAKING RESPONSE TO ASSOCIATION OF MAJOR POWER CONSUMERS IN ONTARIO

UNDERTAKING NO. J4.3:

Reference(s):

To provide updated numbers for 2015 to 2019 on in-service additions.

RESPONSE:

The table below summarizes the total in-service additions forecasted for 2015 to 2019.

	2015	2016	2017	2018	2019
In-service Additions	$539.7M	$671.6M	$505.7M	$441.0M	$529.9M

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J4.4:

Reference(s):

To provide a breakdown of numbers in Appendix C by segment, or to explain why a breakdown cannot be provided.

RESPONSE:

The following table provides an ICM segment-level breakdown of the information regarding the 188 completed jobs originally provided in the response to 2B-OEBStaff-39, Appendix C.

ICM Segment	Job Count	Approved CAPEX (Millions)	Actual CAPEX (Millions)	Actual ISAs (Millions)
B1 Underground Infrastructure	40	$ 39.92	$ 45.70	$ 45.67
B2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers	1	$ 0.11	$ 0.15	$ 0.15
B3 Handwell Replacement	56	$ 12.92	$ 13.04	$ 13.04
B4 Overhead Infrastructure	26	$ 17.51	$ 21.50	$ 21.50
B5 Box Construction	1	$ 1.71	$ 2.50	$ 2.49
B6 Rear Lot Construction	13	$ 19.98	$ 20.20	$ 20.18
B9 Network Vault & Roofs	9	$ 9.51	$ 6.42	$ 6.42
B10 Fibertop Network Units	18	$ 2.62	$ 2.57	$ 2.57
B11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)	4	$ 1.08	$ 1.12	$ 1.11
B12 Stations Power Transformers	1	$ 0.36	$ 0.36	$ 0.36
B20 Metering	7	$ 13.14	$ 14.95	$ 13.04
B21 Externally-Initiated Plant Relocations and Expansions	12	$ 5.80	$ 6.21	$ 6.21
Total	**188**	**$ 124.67**	**$ 134.72**	**$ 132.74**

ORAL HEARING UNDERTAKING RESPONSE TO CONSUMERS COUNCIL OF CANADA

UNDERTAKING NO. J4.5:

Reference(s):

To confirm when the numbers filed in July were finalized internally (Exhibit 2A, Tab 6, Schedule 2).

RESPONSE:

The forecast capital spending in Exhibit 2A for 2014 to 2019 was finalized at the end of June 2014. Certain forecast spending was updated with new information in the September 2014 update. An update to capital spending forecasts with respect to Copeland was filed on February 6, 2015.

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

UNDERTAKING NO. J5.1:

Reference(s):

To provide a list of which segments, other than rear lot conversions, have updated unit quantities

RESPONSE:

As part of the February 6, 2015, update to the CIR application, Toronto Hydro corrected the unit count forecasts in the following seven Distribution System Plan capital programs:

- E6.1 UG Circuit Renewal
- E6.4 OH Circuit Renewal
- E6.6 Rear Lot Conversion
- E6.7 Box Construction
- E6.8 SCADAMate R1 Renewal
- E7.3 Feeder Automation
- E7.4 Polymer SMD20 Renewal

Please note that this was strictly a presentation error with respect to the unit forecast tables; therefore, the updated information had no bearing on the costs of the program or the business case evaluation.

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

UNDERTAKING NO. J5.2:

Reference(s):

To describe in plain language current and prospective situations involving EV charging and energy storage systems.

RESPONSE:

Currently, it is anticipated that the increased penetration of EVs and charging stations on lateral portions of a feeder, regardless of the type and level of charging stations, may require upgrades to local distribution system infrastructure.

In this situation, Toronto Hydro proposes that LES is a cost effective alternative to replacing assets outside of their useful life. An LES unit is deployed for a specific section of a feeder, and in this situation would be deployed on the lateral portion of a feeder with a significant presence of EVs. Because the concentration of EV charging stations is not uniformly spread along the entire feeder, GSES and MSES units are not suitable.

As the uptake of EVs increase, the distribution of EV charging stations physically located along a feeder will become uniform. In this situation, GSES and MSES units are more suited to help enable EV connections.

Across Toronto, the EV residential charging stations typically range between 3.4 kW and 17.6 kW in peak demand. This compares with a typical demand of 10 kW for a gas- **/C**
heated residence across Toronto. Service/metering costs for EV connections across

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

Toronto are the responsibility of the customer. There are currently approximately 1,000 EVs in the Toronto area (approximately half of the 2,000 EVs across Ontario as per the Ministry of Transportation[1]).

[1] http://www.mto.gov.on.ca/english/dandv/vehicle/electric/

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

UNDERTAKING NO. J5.3:

Reference(s):

To consult with PSE and advise whether major event data can be removed from their results, or to explain why it cannot be done.

RESPONSE:

The Major Event Days (MED) data cannot be separated from the combined dataset, as all Ontario reliability data is reported inclusive of MEDs, but without MED values separately quantified.

As to the U.S.-only dataset, Appendix J to the undertaking 1B-SEC-8 provides an earlier (2013) PSE reliability benchmarking study based on a U.S.-only sample that excluded MEDs. The conclusions of that study are directionally aligned with those of the 2014 report that included the MEDs in the outage definition. Toronto Hydro notes that the 2014 PSE benchmarking study explicitly sates that the utility's future reliability projections assume normal weather, and would result in higher indices if a major event were to occur.[1]

[1] PSE Report, Exhibit 1B, Tab 2, Schedule 5, Appendix B, p.41, footnote 34.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. J6.1:

Reference(s):

To provide the proportion, in dollars, of asset renewal determined from the FIM for each of the years.

RESPONSE:

None of the dollars requested for asset replacement in the System Renewal category are "determined from the FIM." While Toronto Hydro used the Feeder Investment Model (FIM) to evaluate the business cases for the asset replacement programs proposed and to confirm the prioritization of the particular assets scheduled for replacement, the FIM was not the driver for asset replacement. The driver for all asset renewal projects is the age and condition of assets. The FIM is one of many decision-support systems that are used by Toronto Hydro as part of developing System Renewal investments. As discussed in Exhibit 2B, Section E2, the FIM is also used as part of the Long-Term System Review Process to produce the asset renewal portion of the economically-optimal capital investment approach, as provided on page 5, Figure 4 of this exhibit.

Figure 1 below shows the percentage of System Renewal category investments that were evaluated using the FIM. Table 1 below presents the same information on both a dollar and percentage basis.

For reference, Table 2 shows the programs in the System Renewal category and the dollars associated with each program.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

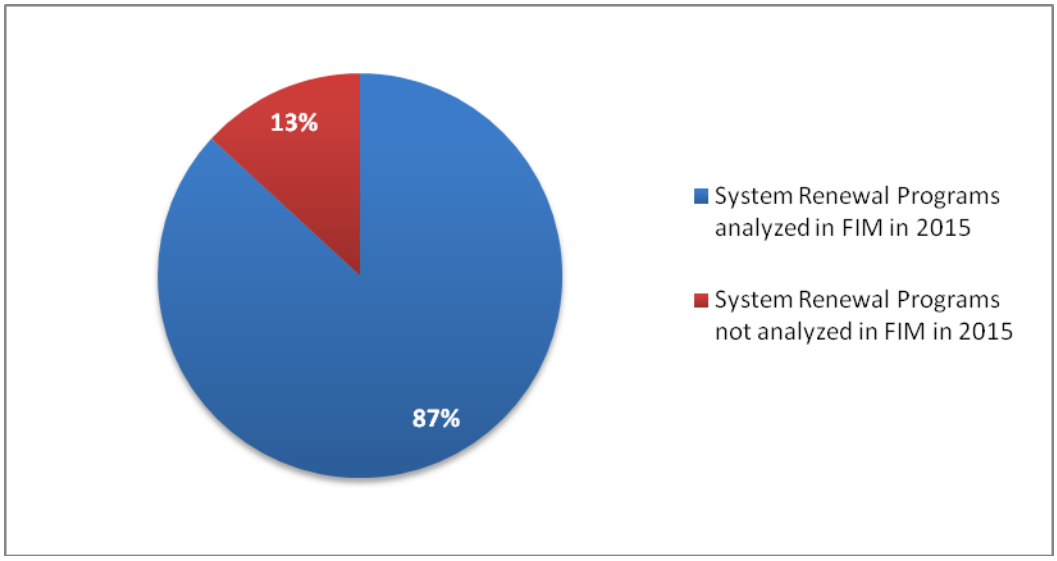


Figure 1: Percentage of system renewal assets in the proposed 2015 list that went through the FIM

Table 1: Percentage of system renewal assets in the proposed 2015 list that went through the FIM

	2015 Program (%)	2015 Program ($)
System Renewal Programs analyzed in FIM in 2015	87%	$ 218,663,254
System Renewal Programs not analyzed in FIM in 2015	13%	$ 33,076,868
Total	100%	$ 251,740,123

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

Table 2: System Renewal programs with associated planned 2015 spending.

Program	2015
SYSTEM RENEWAL	
Underground Circuit Renewal	$ 95,984,766.87
Underground Legacy Infrastructure	$ 2,060,559.51
Paper-Insulated Lead-Covered (PILC) Piece-outs and Leakers	$ 3,450,832.73
Overhead Circuit Renewal	$ 43,972,766.53
Overhead Infrastructure Relocation	$ 743,213.63
Rear Lot Conversion	$ 17,048,379.53
Box Construction Conversion	$ 16,796,984.32
SCADA-MATE R1 Replacement	$ 6,160,650.25
Network Vault Rebuild Program	$ 3,951,900.53
Network Unit Renewal Program	$ 5,183,766.31
Legacy Network Equipment Replacement (ATS & RPB)	$ 447,859.56
Stations Switchgear Renewal	$ 11,879,224.00
Stations Power Transformer Renewal	$ 1,676,258.29
Stations Circuit Breaker Renewal	$ 1,659,301.95
Stations Control & Monitoring	$ 79,437.36
Station Ancillary Systems	$ 687,786.21
Stations Buildings	$ 549,750.95
Stations DC Battery Replacement	$ 273,997.23
Distribution System Communication Infrastructure	$ 6,055,818.60
Reactive Capital	$ 31,896,048.38
Worst Performing Feeder	$ 1,180,819.95
SYSTEM RENEWAL TOTAL	$ 251,740,122.69

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. J6.2:

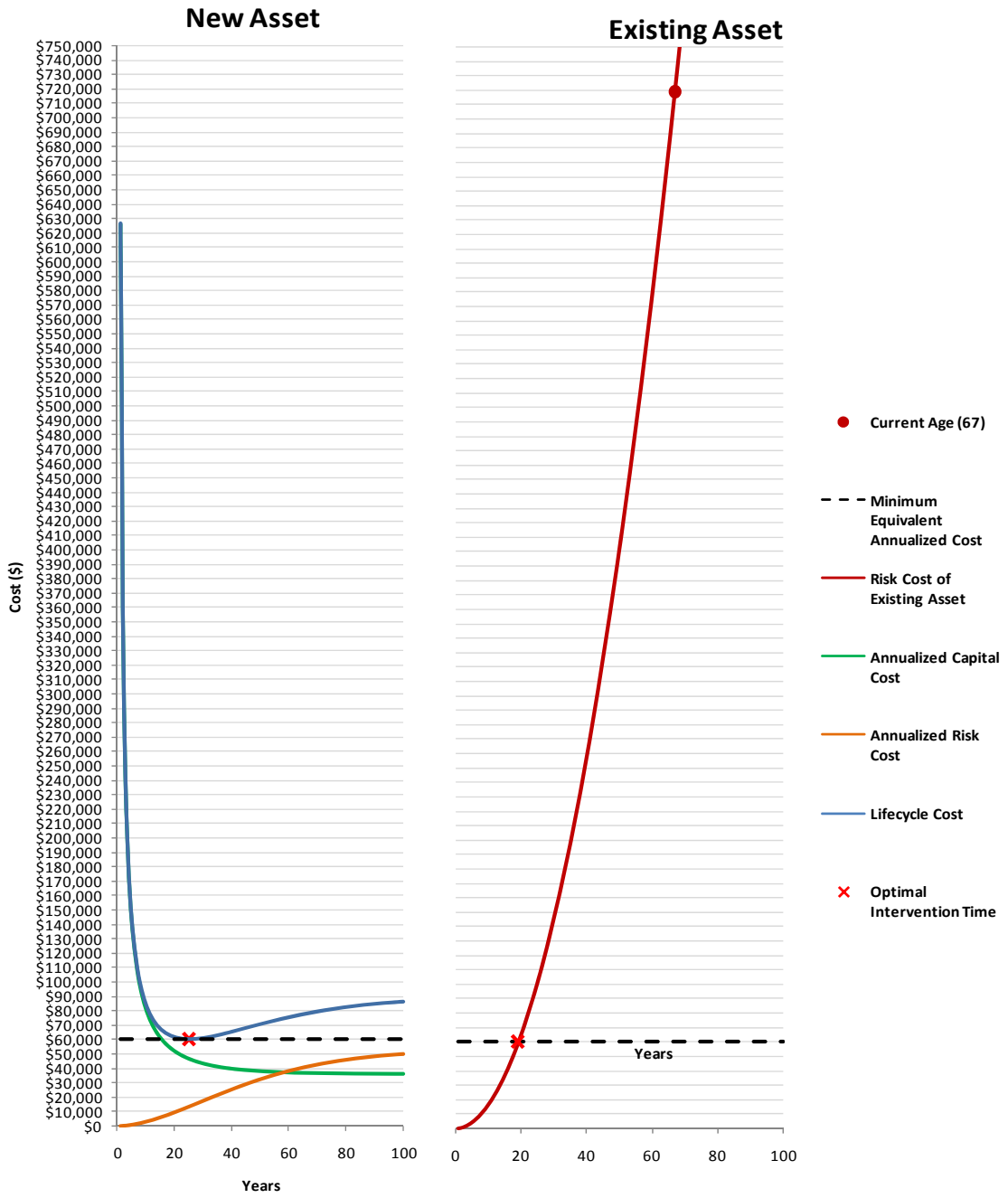
Reference(s):

To extrapolate the risk curve for TR2 transformers to the 60-year mark.

RESPONSE:

TR2 is an individual transformer located at High Level MS. It is currently 67 years old. Figure 1 from Technical Conference Undertaking Response J1.15 has been reproduced in Figure J6.2-1 below in order to illustrate where the Existing Asset's Risk Cost curve for TR2 High Level MS intercepts with the 67-year age on the horizontal axis, which is illustrated with a red dot. At that point, the risk cost for the TR2 High Level MS power transformer reaches a value of $719,281.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF



1 **Figure J6.2-1: Lifecycle Cost for TR2 High Level MS**

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

UNDERTAKING NO. J6.3:

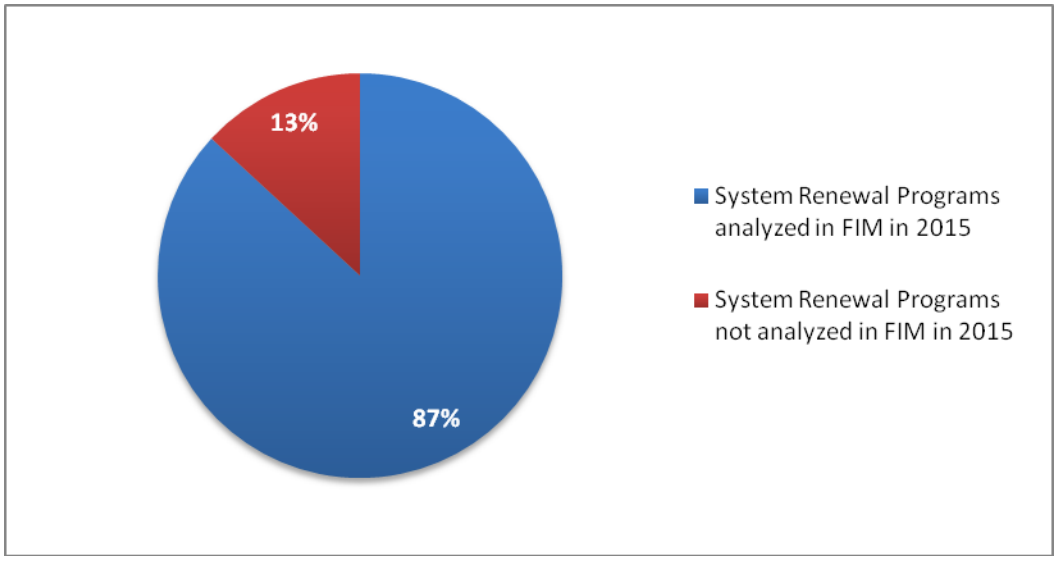
Reference(s):

To confirm whether it is all pole types, sizes, and classes used for streetlighting that forms the basis for the $2,340 all-in cost.

RESPONSE:

Confirmed.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF



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ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

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SYSTEM RENEWAL TOTAL	$ 251,740,122.69

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

UNDERTAKING NO. J6.4:

Reference(s):

To provide consultant's report on pole dates.

RESPONSE:

A copy of the Streetlighting Inventory Study is attached as Appendix A to this Schedule. This study was filed with the OEB in the Streetlighting proceedings (EB-2009-0180 et al.). The data underlying the study was contained in an Excel spreadsheet. Attached as Appendix B to this Schedule is an excerpt of the spreadsheet relating to the vintages of the streetlighting poles.

Toronto Hydro-Electric System Ltd.

Streetlighting Division

Quality Assurance and Quality Control Plan for Streetlight Inventory

Toronto, Ontario

June 2010

Toronto Hydro-Electric System Ltd.

Streetlighting Division

Quality Assurance and Quality Control Plan for Streetlight Inventory

Toronto, Ontario

June 2010

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Project # 5041

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TABLE OF CONTENTS

Appendices

Tables

1. PURPOSE

The HDR | iTRANS Quality Assurance and Quality Control plan defines the attributes and values for the Toronto Hydro Streetlight Inventory project. In addition, this plan provides the specifications, minimum standards, and procedures for the data to be delivered to Toronto Hydro.

The quality control and quality assurance procedure is for HDR | iTRANS, and does not specify the procedures used by Horizon Data Services Limited or Toronto Hydro-Electric System Ltd.

2. ATTRIBUTES AND VALUES

An *attribute* is a category that is assessed for a streetlight, such as for example "Pole Ownership". A *value* is the option or answer that the corresponding attribute can take, such as "Streetlighting", "Distribution", "Bell", or "TTC". The source for the data is derived either from the Toronto Hydro GEAR System which is then validated during the field data collection, or is collected directly from the field site visit. Mandatory values are values which must be collected as part of the minimum data requirements.

The selection of attributes and values was determined through a serious of working meetings between HDR | iTRANS and Toronto Hydro.

The attributes and values are broken up into five categories and provided in the following tables:

Table 1: Pole
Table 2: Bracket
Table 3: Luminaire
Table 4: Street Area Type
Table 5: Photos

Table 1: Pole

POLE			
ATTRIBUTE	**VALUE**	**SOURCE**	**MANDATORY**
GEAR FID #		Toronto Hydro Gear System	Y
Pole Ownership		Field Collection	Y
	Streetlighting	Field Collection	
	Distribution	Field Collection	
	Bell- Wood/Alley	Field Collection	
	TTC - Steel+Supports TTC Wires	Field Collection	
Address/Location		Field Collection	
Location Type	Street/Laneway/Other	Field Collection	Y
Address No		Field Collection	
Street 1		Toronto Hydro Gear System	Y
Street1 Suffix		Toronto Hydro Gear System	
Street1 Direction		Toronto Hydro Gear System	
Street 2		Field Collection	Y - intersection
Street2 Suffix		Field Collection	
Street2 Direction		Field Collection	
Survey Date/Time		System Generated	Y
Mounted Luminaire	Pole / On a structure, wall mount / Underpass	Field Collection	Y
Pole Number		Toronto Hydro Gear System	
Foundation	Base mounted / Direct buried	Field Collection	Y
Pole Class	A/B/C/D/E/F/G/1/2/3/4/5/6/78/9/0	Toronto Hydro Gear System	
Pole Height (ft)	25 or less/30/32.5/35/40	Toronto Hydro Gear System	Y
Installation Year	YY	Field Collection	
Distance to closest pole	25 or less/35/45/55	Field Collection	Y Default is 25

(m)			
Pole Material	Concrete/Aluminum/Wood/Steel/Iron/Fiberglass	Toronto Hydro Gear System	Y
Pole Style	Standard/Decorative	Field Collection	
Pole Condition	1/2/3 (1 - Good/2 - Monitor/3 - Replace)	Field Collection	Y
Condition Comments		Field Collection	Y -If Condition is 3
Handhole Cover Condition	1/2/3 (1 - Good/2 - Monitor/3 - Replace)	Field Collection	
Electrical Supply	Overhead/Underground	Field Collection	Y
Is there a handwell?	Y/N	Field Collection	Y
Handwell Condition	1/2/3 (1 - Good/2 - Monitor/3 - Replace)	Field Collection	
Attachments		Field Collection	
Distribution Wires	Y/N	Field Collection	
3rd Party Electrical	Y/N	Field Collection	
Service Wires	Y/N	Field Collection	
Traffic Light	Y/N	Field Collection	
Temporary Feed	Y/N	Field Collection	
Support Wire	Y/N	Field Collection	
3rd Party Box	Y/N	Field Collection	
Control Relay	Y/N	Field Collection	
TTC Wire	Y/N	Field Collection	
Others	Y/N	Field Collection	
Other Comments		Field Collection	Y - Others is Y
EXCEPTION	Y/N (Default: N)	Field Collection	
EXCEPTION Comments		Field Collection	Y - If Exception is Y

Table 2: Bracket

BRACKET

ATTRIBUTE	VALUE	SOURCE	MANDATORY
Brackets installed?	Y/N	Field Collection	Y
Number of Brackets	1/2 (Default is 1)	Field Collection	Y
#1 Bracket Type	Top mount/Decorative/Tapered Elliptical/AR9/Lane bracket/Pedestrian Bracket	Toronto Hydro Gear System	Y - If Bracket Installed is Y
#1 Arm Length (ft)	2 and less/6/8 or more	Toronto Hydro Gear System	
#2 Bracket Type	Top mount/Decorative/Tapered Elliptical/AR9/Lane bracket/Pedestrian Bracket	Toronto Hydro Gear System	Y - If Bracket Installed is Y & Number of Brackets is 2
#2 Arm Length (ft)	2 and less/6/8 or more	Toronto Hydro Gear System	

Table 3: Luminaire

LUMINAIRE			
ATTRIBUTE	**VALUE**	**SOURCE**	**MANDATORY**
Number of Luminaires	0/1/2/3/4/5	Field Collection	Y
Cluster?	Y/N (Default: N)	Field Collection	Y
#1 Luminaire Type	Acorn/Cobra Head/Decorative/Oriental hat/Wall Pack/Pedestrian Light	Field Collection	Y
#1 Wattage Color	Red/Gold	Field Collection	
#1 Wattage Value	5/7/10/15/20/25/40	Toronto Hydro Gear System	
#1 On Top	(Gray / Blue) Photocell / (Brown / Black) Shorting cap	Toronto Hydro Gear System	
#2 Luminaire Type	Acorn/Cobra Head/Decorative/Oriental hat/Wall Pack/Pedestrian Light	Field Collection	Y - If Number of Luminaire is greater than 1
#2 Wattage Color	Red/Gold	Field Collection	
#2 Wattage Value	5/7/10/15/20/25/40	Toronto Hydro Gear System	
#2 On Top	(Gray / Blue) Photocell / (Brown / Black) Shorting cap	Toronto Hydro Gear System	

Table 4: Street Area Type

Street Area Type			
ATTRIBUTE	**VALUE**	**SOURCE**	**MANDATORY**
Street - Area Type	Overhead supply/Residential Underground Supply/Mixed Use Underground	Field Collection	Y
Surveyor's Comments		Field Collection	

Table 5: Photos

PHOTOS			
Photo	Digital Photo	Field Collection	Y - if Condition is 3

3. QUALITY CONTROL METHODS

There are several types of errors which may occur during the data collection process, including:

1. Missed poles that are in GEAR. A publicly accessible pole in GEAR was not visited by the surveyor.
2. Missed streetlights that are not in GEAR. A streetlight not in GEAR was not visited by the surveyor, such as a laneway light.
3. Systematic misclassification of data entry. Examples include coding Bell poles as distribution, or using the wrong label for the address information. The survey is purposely entering information, but is consistently wrong. This type of problem should be addressed through additional training.
4. Data entry errors. The surveyor miss keyed while entering data. This includes missing or skipped attributes.

Given the large number of attributes and streetlights, the quality control methods are based upon a sampling approach. There are four types of quality control methods

- Logical checks
- GIS map inspection
- Online street view validation
- Field visit validation

3.1 Logical Checks

The design of the software used for data collection has most of the logical checks built in, however, there are some additional checks than can be conducted through automated checks. The logic checks include:

- Installation year greater than 2010 or smaller than 1950.
- Number of brackets = 1, but no information on the first bracket provided.
- Number of brackets = 2, but no information on the second bracket provided.
- Number of luminaires = 1, but no information on the first luminaires provided.
- Number of luminaires = 2, but no information on the second luminaires provided.
- If the number brackets = 1 or 2 then the number of luminaires should be the same.
- If ownership is Bell than Wattage should equal 7.
- If bracket type equals AR9 then the bracket length should be 8 feet or more.
- If there is a temporary feed attachment then the area type should be underground.
- If the electrical supply equals underground then the area type may be either residential underground supply or mixed use underground.
- If the electrical supply equals overhead then the area type should be overhead supply.

In addition, the logical checks include checks for missing values:

- General
    - Missing Ownership

    - Missing Location
    - Missing Mounted Luminaries
    - Missing Street Area Type
- Exception is "Yes"
    - Missing Exception Comments
- Ownership is "Street lighting Side"
    - Missing Distance to Closest Pole
    - Missing Pole Height
    - Missing Pole Material
    - Missing Style
    - Missing Foundation
    - Missing Electrical Supply
    - Missing Pole Condition
- Pole Condition is "3-Replace"
    - Missing Pole Condition Comments
    - Missing Photo
- Handwell Installed is “Yes”
    - Missing Handwell Condition
- Other Attachment is "Yes"
    - Missing Other Attachment Comments
- Bracket is Installed
    - Missing Number of Brackets
    - Missing Bracket Type
- Bracket is Installed and Number of Bracket is 2
    - Missing Bracket Type 2
- No of Luminaries > 0
    - Missing Luminaries Type 1
- No of Luminaries > 1 and Cluster is No
    - Missing Luminaries Type 2

Use the Logical Checks Form, found in the Appendix, to record results.

Responsibility: Kevin Shen

3.2 GIS Map Inspection

By displaying the collected data on a GIS map, a visual inspection may be conducted to look for GEAR poles that may have been skipped. Since surveyed poles are color coded red, green pole stand out and can be investigated further. GEAR poles which are not publically accessible will remain green.

GIS maps can also be used to look for patterns, such as showing all distribution poles and seeing if there are any strange or unexpected patterns. By querying subsets of the data, it should be possible to conduct a visual inspection of the pattern of streetlights to look for

outliers in the data, such as for example a TTC pole not on an arterial. The following GIS visualization can be conducted under this quality control check:

- Show all green poles (all poles not surveyed). Look for publically accessible poles that were not surveyed.
- Show all TTC poles. Compare against known streetcar routes.
- Show all Distribution poles. Look for outliers and patters.
- Show all Bell poles. Look for outliers and patterns.
- Show all poles by Street Area Type. Look for outliers and patterns.

Use the Map Inspection Form, found in the Appendix, to record results.

Responsibility: Barry McLaughlin

3.3 Street View Validation

Online street view allows for a cost-effective validation of the key attributes listed in **Table 6**.

Table 6: Street View Validation Attributes

Attribute
Pole Ownership
Address/Location
Foundation
Pole Material
Pole Style
Brackets installed?
Number of Brackets
Bracket Type
Number of Luminaires
Cluster?
Street Area Type

The limitations of this method for quality control are

- Online street views are several years old, so there is the potential that things may have changed since the image was captured. Therefore caution should be used when validating.
- Several attributes can not be distinguished from the online images.

Use the Map Inspection Form, found in the Appendix, to record results.

Responsibility: Barry McLaughlin

3.4 Field Visit Validation

This quality control method involves going to a subzone which has been completed and validating the data which has been collected. This method is a duplication of the task of the surveyor and consists of validating all of the data collected in Table 1 to Table 5. The HDR | iTRANS Streetlight Inventory and Condition Review Training Material detail the criteria and method for conducting field visits.

All attributes can be checked using this method.

Use the Field Inspection Form, found in the Appendix, to record results.

Responsibility: Andrew O'Connor and Horizon Data Services Ltd.

4. QUALITY ASSURANCE PROCEDURE

The field collection process followed by Horizon Data Services Ltd.

1. Supervisors received infield training (in pairs) and the Hydro rep (John Farancato) for 4 hrs following the in class training. The supervisor is then required to do a 8 hrs shift (typical full time shift) in collecting data individually. This is monitored by Hydro rep who answers or classify streetlights.
2. The counter goes through a 4 hrs one and one infield training with the supervisor. If the counter passes this test then he is required to do an 8hr peer training under the supervision of another supervisor. If successful the counter starts collecting data on his own. The supervisor is there for support.
3. Both the supervisor and the counter are required to carry a log book which will be returned to Horizon upon completion of project. These log books will be available for inspection by HDR | iTRANS. The log book will include any abnormalities or problems encountered in the field. The log books will record the start, end time and date and the daily number of poles collected (all poles that are inserted and or deleted will be recorded in the log book)
4. The Supervisors will do random checks along with the counter after completion of each subzone. They will check against any abnormality along any street such as temporary overhead wires, exceptions, change in pattern of ownership and laneways. After approval is given the counter will start his next assigned subzone.
5. The supervisors may record any condition in his her log book and check against the PDA info at any time to ensure the data collection is accurate.
6. Supervisors will do daily checks and will spend a minimum of 30 minutes with each counter
7. Supervisors will meet regularly to review progress and to make adjustments accordingly. This may include recommending additional training for counters and or replacement

The field collection process followed by HDR | iTRANS.

8. Conduct site visits to observe the processes used by the surveyors in the field and use the Field Inspection Form, found in the Appendix to record the following:
    a. Based on field observations, was the process being performed properly?
    b. Did the supervisors have any questions, comments, or concerns?
    c. Do the supervisors, surveyors and other staff seem to understand the procedure and process?
9. Every two weeks completed subzones will be received from the surveyors. If the aggressive schedule can be maintained, it is estimated that between 60 and 100 subzones per two week period will be completed. There are 537 subzones in total.
10. Individual subzones are assembled into a single data set.
11. Run automated logical checks
12. Inspect the data using GIS map inspection
13. Conduct stratified randomized sampling using online street view validation
14. Conduct field visit validation

Responsibility: Scott Prugh

5. ESTIMATE OF DATA RELIABILITY

Use Equation 8.13 page 285 from David J. Sheskin Handbook of Parametric and Nonparametric Statistical Procedures. Fourth Edition. Chapman & Hall/CRC Publishers. 2007 in order to estimate the reliability of the collected data:

$$\sqrt{n} = \frac{z_{\alpha/2}\sqrt{p_1 p_2}}{w}$$

Where

n = the sample population

$z_{\alpha/2}$= the standard score, or how many standard deviations an observation is above or below the mean. For a 95% confidence level, $z_{\alpha/2}$= 1.96.

p = sample proportions. In this case it is the proportion of data that is in error, let's say 5%.

Given that the sample size is fixed, we want to solve for the confidence interval as follows:

$$w = \frac{z_{\alpha/2}\sqrt{p_1 p_2}}{\sqrt{n}}$$

Next, we plug in the values. **The following values are for illustration purposes only. The following values are shown in order to illustrate the methodology**:

n = 40 (number of poles sampled in the subzone. The average subzone has 400 poles.)

p = 0.05 (proportion of poles with errors)

$z_{\alpha/2}$= 1.96 (5% confidence interval)

$$0.068 = \frac{1.96\sqrt{0.05 \times 0.95}}{\sqrt{40}}$$

Which gives us a confidence interval of 0.068, or 7% for a subzone where the sample we inspected had a 5% error rate. This means we can be 95% confident that the true error rate is between 5% and 12% (5 + 7%).

Note that this methodology is appropriate for large populations (it is appropriate for evaluating the reliability of the entire study with over 100,000 poles). For subzones, which are small, the estimate is too conservative and in this example the confidence interval is even smaller than 7%.

Responsibility: Maurice Masliah

Appendix A
Quality Control Forms

Logical Checks Form - Quality Control for Streetlight Inventory

SubZone			Date			Reviewer		
Logical Checks Completed								
List any poles which fail the logic checks and return to Horizon for completion								

Map Inspection Form - Quality Control for Streetlight Inventory

SubZone	Date	Reviewer
Check of Surveyed Poles (Green/Red) Completed		
Use Google Street View to cofirm poles are publically accessible.		
List GEAR FID # of un- surveyed poles.		
Check of TTC Poles Completed		
Use Google Street View to cofirm poles are on street car routes.		
List GEAR FID # of error poles.		
Check of Distribution Poles Completed		
Use Google Street View to cofirm poles ownership.		
List GEAR FID # of error poles.		
Check of Bell Poles Completed		
Use Google Street View to cofirm poles ownership.		
List GEAR FID # of error poles.		
Check of Street Area Type Completed		
Use Google Street View to cofirm street area type.		
List GEAR FID # of error poles.		

Field Inspection Form - Quality Control for Streetlight Inventory

SubZone ______________ Date ______________ Reviewer ______________

Make corrections to the data directly to the database. Record the changes in this form.

GEAR FID #	What attributes were changed?

Field Inspection Form - Quality Assurance for Streetlight Inventory

SubZone			Date			Reviewer		
Location			Time					
Based on field observations, was the process being performed properly?								
List any discrepancies								
Did the supervisors have any questions, comments, or concerns?								
Do the supervisors, surveyors and other staff seem to understand the procedure and process?								

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J6.5:

Reference(s):

To explain which savings outlined in 2B-SEC-39, Appendix A are OM&A savings and which are capital savings.

RESPONSE:

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

Section 7.7 Metrics to Measure Benefits Attainment

Response to Interrogatory J6.5

ID	Metric Name	Year 1 Annual Benefit Capex	Year 1 Annual Benefit Opex	Year 2 Annual Benefit Capex	Year 2 Annual Benefit Opex	Year 3+ Annual Benefit Capex	Year 3+ Annual Benefit Opex
Goal: Cost Savings							
3.1	Planning Cycle Integration	-	17	-	23	-	23
3.2	Budget Transfer Automation	-	6	-	8	-	8
3.3	Elimination of External Consulting Support	-	113	-	150	-	150
4.1	Month-End Processing Time	-	16	-	21	-	21
4.2	Automatic production of shell documents	-	49	-	65	-	65
4.3	Asset Capitalization	71	18	94	24	94	24
4.4	Funding Type Automation	11	3	14	4	14	4
4.5	Automated Financial Reporting	8	2	10	3	10	3
4.6	Automated Trial Balance	-	0	-	1	-	1
5.1	Payroll Journal Entry Automation	-	32	-	42	-	42
6.1	Timesheet Data Entry Automation	-	75	-	100	-	100
6.2	Planned Overtime Reduction	1,125	-	1,500	-	1,500	-
7.1	Automated Business Reporting	-	19	-	25	-	25
7.2	Field Resource Optimization	6	13	7	18	7	18
7.3	Timesheet Data Entry Automation	-	38	-	50	-	50
8.1	Warranty Cost Recovery	-	60	-	80	-	80
8.2	Inventory Reduction	80	-	107	-	107	-
9.1	Ellipse & Legacy System Operations	-	1,632	-	1,632	-	1,632
9.2	IT Incident Mgmt Savings	-	65	-	86	-	86
		1,300	**2,155**	**1,733**	**2,330**	**1,733**	**2,330**
			3,455		**4,063**		**4,063**
Goal: Increased Productivity							
1.1	Journal Entry And Reconciliation Savings	-	77	-	100	-	118
2.1	Improved Business Reporting	-	33	-	43	-	50
2.2	Designer System Rationalization	195	-	255	-	300	-
3.1	Improved Business Reporting	-	56	-	74	-	87
3.2	Increased Unit Completions	49	119	65	155	76	183
4.1	Procurement Time Savings	-	34	-	44	-	52
4.2	Work Order Entry Efficiency	-	9	-	12	-	14
4.3	One-Time Vendor Efficiencies	-	8	-	10	-	12
4.4	Data Reconciliation Efficiencies	77	-	101	-	118	-
5.1	Designer System Rationalization	65	-	85	-	100	-
6.1	Improved IT System Reliability	-	1,137	-	1,487	-	1,749
		386	**1,472**	**505**	**1,924**	**594**	**2,264**
			1,858		**2,430**		**2,858**

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J6.6:

Reference(s):

To provide on a confidential basis, the percentage of contingency being utilized for the design and implementation of the ERP system.

RESPONSE:

The Project Contingency is [redacted]%.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. J6.7:

Reference(s):

To confirm whether the portion of revenue THESL is receiving from TH Energy's contract with the City of Toronto is equivalent to the portion of the assets transferred over to THESL.

RESPONSE:

The portion of revenue to be allocated to Toronto Hydro from TH Energy's contract with the City of Toronto is not equivalent to the portion of the assets transferred from TH Energy to Toronto Hydro. Adopting a proportionality-based allocation methodology would not keep the revenue requirement impact of the transfer neutral.

The revenue allocation is determined on the basis of the revenue requirement associated with the transferred assets, as detailed in Exhibit 2A, Tab 5, Schedule 1, Table 4. The methodology of calculating the revenue requirement is consistent with the methodology that Toronto Hydro uses to calculate revenue requirement for its other assets (see Exhibit 6, Tab 1, Schedule 1).

ORAL HEARING UNDERTAKING RESPONSE TO VULNERABLE ENERGY CONSUMERS COALITION

UNDERTAKING NO. J7.1:

To confirm whether the criteria for general industry peer group in the Towers Watson Study are disjunctive, as opposed to conjunctive.

RESPONSE (PREPARED BY TOWERS WATSON):

The peer group selection criteria for the named general industry peer group are disjunctive. Some of the companies listed will have employees located in the GTA and reported revenues within the defined range but an employee headcount that sits outside of the defined range. Likewise, some organizations have reported revenues and an employee headcount that sit within the defined range, but no employees within the GTA.

The criteria aimed to deliver a peer group that is (a) broadly reflective of the types of organization that Toronto Hydro would compete with from a talent management perspective, (b) likely to have similar roles at a similar level to those selected for the benchmarking study, and (c) are large enough to provide robust market data for comparison The latter of these three points is a significant one. Having initially restricted our view to organizations that met the revenue and headcount criteria and that were headquartered (e.g., as a parent organization) in the GTA, only seven companies satisfied the criteria. It was important, therefore, to take a broader view in order to ensure that the resulting data offered a genuine reflection of the market rather than one that was perhaps at risk of being skewed (upwards or downwards) by a small number of organizations.

The general industry named peer group is intended to provide a supplementary data point for comparison to the named energy peer group to ensure that any industry bias is understood and balanced in the context of general industry norms.

ORAL HEARING UNDERTAKING RESPONSE TO SOCIETY OF ENERGY PROFESSIONALS

UNDERTAKING NO. J7.2:

Reference(s):

To provide the 2014 Toronto Hydro safety metric and the 2012 and 2013 results for both Toronto Hydro and the external contractors.

RESPONSE:

Please see the following table.

YEAR	Toronto Hydro TRIF	Contractor Average TRIF
2012	2.15	1.89
2013	2.26	1.96
2014	1.18	1.22*
Three-Year Average	**1.86**	**1.61**

**Toronto Hydro notes that the 2014 contractor average TRIF value presented in the original response to OH Undertaking J1.1 was incorrect. An updated response to that undertaking has been filed to correct the record.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. J7.3:

To reconcile previous information on engineering and design costs.

RESPONSE:

	Engineering	Design
Type of Work	• Conducting the Asset Management Planning Process illustrated in Ex. 2B, Section D1 including developing the scopes of work and high-level planning estimates for particular projects[1]; and • Developing the design and construction standards that will be applied to arrive at the specific designs for projects/jobs.	• Developing the specific designs (e.g. equipment layouts, selection of specific types of material and equipment) for particular scopes of work (i.e. projects), including developing the detailed design estimate for particular projects.
Resources	• Conducted internally by Professional Engineers represented by the Society of Energy Professionals. • *Note*: In some instances, Toronto Hydro uses third party engineering firms to perform specific studies (e.g. Asset Condition Assessments)	• Conducted internally by engineering technologists represented by CUPE. • Conducted externally by design and construction contractors. *Note:* In some instances, Toronto Hydro uses specialized design firms to perform complex design work.
Costs	• Engineering costs are typically allocated to capital projects using a percentage-based methodology. • Over the plan, the costs will be tracked through the Planning, Engineering and Support Costs metric (Exhibit 2B, Sec. C3.2), and are expected to range between 6.2% and 6.8% of the annual distribution capital costs (2B-SEC-19).	• Internal design costs are typically charged directly to the project through project work orders. In a given year, internal design costs typically range between 6% to 8% of the planned (i.e. non-reactive) distribution capital work executed by internal resources. • External design and construction costs are charged directly to the project through project work orders. Typically, the design component ranges between 5% to 10% of the external design and construction cost.

[1] Under the ICM framework, projects were commonly referred to as jobs.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J7.4:

Reference(s):

To produce the Financial Planning Process update presentation if there are notes, or if there are no notes, to advise that it will not be produced.

RESPONSE:

The file does not contain notes and thus need not be produced.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. J7.5:

Reference(s):

To provide the business case on web portal consolidation.

RESPONSE:

Please see the attached Business Case provided in Appendix A. Toronto Hydro notes that the project scope as reflected in the Business Case has been modified at the later stages of the project due to competing priorities and the associated resourcing constraints.

Business Case Template

Customer Self Service II

Document Version: 1.0

Print Date: 1/31/2013

Organization: Toronto Hydro Electric System Ltd.

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Business Case Objectives

The purpose of this document is to provide a common business case template that will be used for r programs within the Toronto Hydro organization. The objectives of the proceeding sections are to provide a framework to use when describing the initiative within the relevant section.

Toronto Hydro relies on the business case as the defining document to establish the business specific context for undertaking a project or program initiative. The business case is a deliverable created in parts during the initial feasibility study phase of the overall Toronto Hydro Governance Lifecycle; prior to commencing program work. All business cases must be of value to the organization.

The business case must be written in a clear and concise manner, while providing sufficient information to confirm program efficiency, adequate information to prioritize the program among other initiatives, and ensuring due diligence (for risk, scope, cost, strategy, benefits, responsibilities, etc). Any other necessary information must be provided for executive level decisions to be aligned with corporate strategic direction.

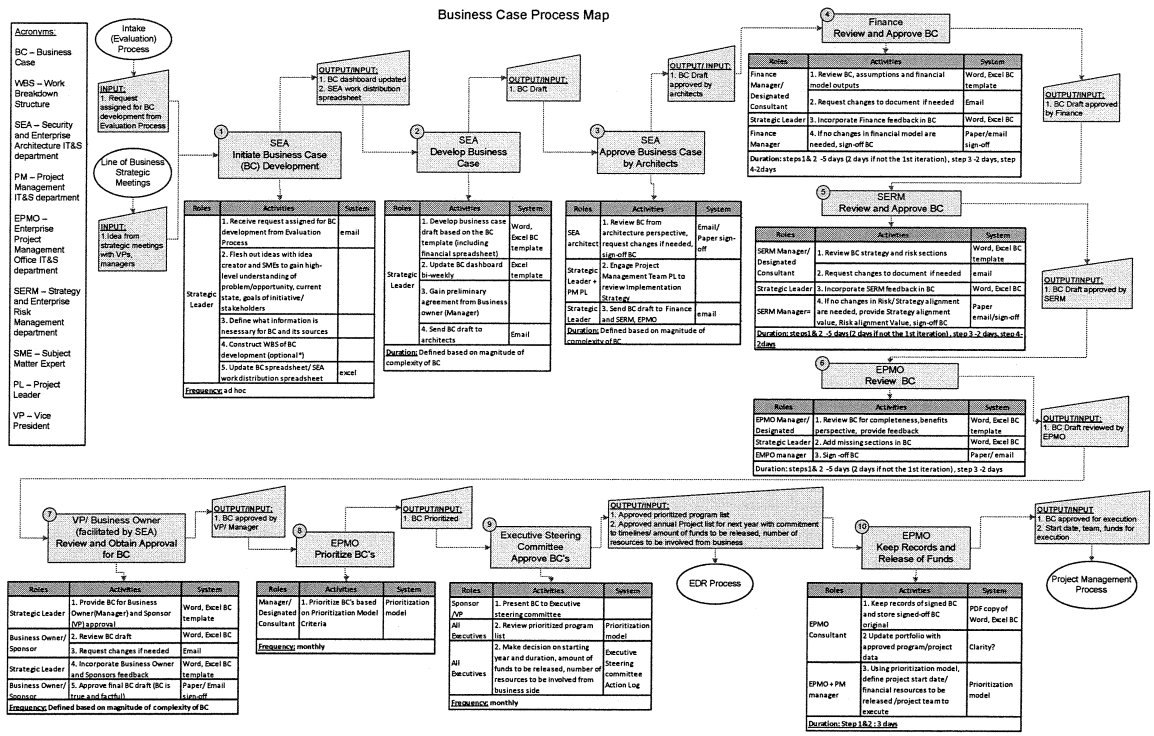
Business Case Tolerance

The Business Case sensitivity tolerance value for costs and benefits should be 25%.

Business Case Change Control

Change control tolerances are cumulative and are set to +10% for cost, and -10% for benefits. Cost and Benefit changes are considered mutually exclusive entities; therefore changes from approved baselines cannot be combined to arrive at a net change value.

Business Case Approval Process



Business Case Re-approval

Program/ project forecasting a 10% cost increase from the approved baseline, and/or a 10% reduction in benefits will be required to receive approval through an established change control process. Business case re-approval is not normally required until a 25% increase or 25% reduction of cumulative changes in cost or benefits exceed the sensitivity tolerance of 75%.

Feedback on the Business Case Template

All suggestions and inquiries on this template should be directed to the Enterprise Project Management Office (EPMO) at Toronto Hydro.

Signatures

Reviewed By:

Group	Name	Title	Date (DD/MM/YY)	Email
IT&S Architecture	Steve Jacka	Sr Infrastructure Consultant	10/10/12	Phone
Finance	Ramona Jadunauth-Khan	Sr Fin Analyst	12/09/12	Yes
SERM	Firas Arafat Valerie Shen	Strategic Planning Consultant ERM & Policy Analyst	06/09/12 05/09/12	Yes
EPMO	Syd Carter	Enterprise Project Management Consultant	07/09/12	Yes

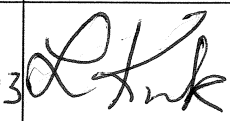
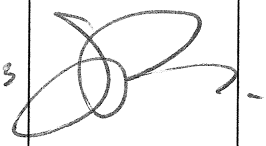
IT Portfolio *(please check the box below)*:

IT	Customer Services & CDM	Operations	Corporate
	X		

Sponsored By:

Role	Name	Title	Date (DD/MM/YY)	Signature
Executive Sponsor	Chris Tyrrell	Vice President, Customer Care and Chief Conservation Officer	13/02/13	
Co-Sponsor	Rob Wong	Vice President, IT and Strategy	15/02/13	

Approved By:

Role	Name	Title	Date (DD/MM/YY)	Signature
Business Manager & Decommissioned Systems Owner	Lauren Kirk	Manager, Call Centre	13/02/2013	
Architecture - Technical Governance	Sam Zurzolo	Manager, Security & Enterprise Architecture	28/01/2013	
EPMO – Project Governance	Anthony Policicchio	Manager, Project Management Offices	08/02/2013	

Document Control Information

Version	Date (MM/DD/YY)	Accountability (Last, First Name)	Change Comments
1	08/15/12	Tichbon, Warwick	Initial draft and incorporation of I.T. Project Management and Customer Care, Strategic Project comments
2	11/29/12	Tichbon, Warwick	Updated timelines and delivery approach
3	01/07/13	Tichbon, Warwick	Included additional CSS1 enhancements, CSR console enhancements and Customer Isolations Work Request Form
4			
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6			
7			
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Table of Contents

1 EXECUTIVE SUMMARY

The Customer Self Service (CSS) II program contains enhancements to the newly developed customer self service portal. It consists of four core improvements:

1. Merging the three customer portals (Time of Use, CSS and eBills) into a single portal simplifying data security and greatly improving the customer experience;
2. Providing the means for customers to pay their bills directly through the CSS portal;
3. Automate the processing of Move-In requests performed within the CSS portal by customers who do not have an existing Toronto Hydro account; and
4. Automate the processing of lawyer initiated move requests.

In addition to these four elements there are also minor changes and enhancements related to the original portal and agent console.

The technical changes required to achieve this objective also align to Information Technology strategies in terms of improved data security, elimination of end-of-life applications and they support the move to a standards based environment.

As a result of this alignment, the program directly contributes to mitigating two corporate risks; Information Technology and Cyber Security, a top 10 risk. The Information Technology risk is mitigated through the decommissioning of aging and end-of-like hardware and software. The Cyber Security risk is mitigated through the implementation of a single, standards-compliant security solution of customer online data and transactions.

From the strategic alignment perspective this program is specifically focused on the customer service pillar. However due to the cost reduction and productivity improvements, the program also shows alignment to the financial pillar. The completion of the program will contribute to improvements in the Call Centre Service Response and Enhanced Customer Engagement corporate KPIs by diverting calls from the Call Centre and enabling increased productivity within the call centre.

Investment Total		
Net Capital Invested	$	(1,700,000)
Chargeable (program capital budget)	$	(1,580,000)
Non-chargeable time	$	(120,000)

Total Corporate Value		
Comprehensive Net Present Value (all costs, all benefits)	$	690,000

Total Cash Value		
Net Present Value (all costs, cash benefits only)	$	690,000

Dollar-Equivalent Non-Cash Benefits		
Productivity (time saving, increased throughput, etc.)	$	0
Carbon Savings	$	0
Reliability Improvements	$	0
Community Contributions	$	0

Other Prioritization Criteria	
Internal Rate of Return	22.04%
Payback Period	4.31 years
Strategic Alignment Score	
KPI Alignment	No Alignment
Pillar Alignment	No Alignment
Risk Alignment Score	9

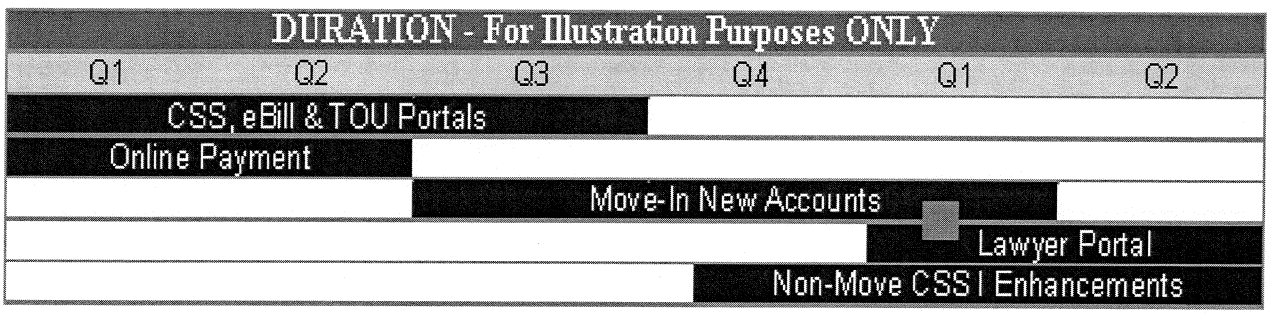
The program is to be managed as four projects to balance the organizational change and delivery risk with achieving the benefits as early as possible. The Lawyer Portal project will follow the Move-In New Accounts project as it utilizes the new functionality being built.

It is recommended to proceed with the CSS II program due to the financial benefits, the achievable gains in Information Technology security and reliability, and considerable customer experience improvements. The customer experience improvements will drive greater adoption and usage of the website, which is ultimately a lower cost channel than the Call Centre for Toronto Hydro.

1.1 Details for Program Constraints

Portfolio	Program	Project Name	Baseline Budget		Duration/ Timeline (In months)	Dependency
			CAPEX*	OPEX		
Customer Care	**Billing / Energy Management**	**Customer Self Service II**	**$ 1,580,000**	**$ -**	**6**	
Customer Care	Billing / Energy Management	CSS, eBill & TOU Portals	$ 480,000	$ -	7-9	N/A
Customer Care	Billing / Energy Management	Online Payment	$ 150,000	$ -	6	N/A
Customer Care	Billing / Energy Management	Move-In/New Accounts	$ 510,000	$ -	7-9	N/A
Customer Care	Billing / Energy Management	Lawyer Portal	$ 250,000	$ -	4	Move-In New Accounts
Customer Care	Billing / Energy Management	CSS I Enhancements	$ 190,000	$ -	2	N/A

High-level schedule and dependencies for this program (within the program, to other programs) are shown below:



Note: In this case, since there is only 1 Dependancy, individual project start dates will be defined per IT Portfolio constraints.

2 BACKGROUND, CURRENT and FUTURE STATE

This section profiles the rationale for the initiative and is comprised of five focal point sections:

2.1 Problem/ Opportunity Statement

2.2 Current State

2.3 Stakeholders / Requirements

2.4 Future State

2.5 Options to Achieve Future State

2.1 Problem / Opportunity Statement

The Customer Self Service (CSS) I project delivered a foundation and initial set of customer self service transactions. CSS II is the follow up program and further increases the value of the CSS Portal to both the customers and to Toronto Hydro (TH).

The primary area of opportunity covered in this business case is cost avoidance, and is achieved through performing customer interactions through a less expensive channel and through simplification of technology support requirements. This project will improve the integration between the Time of Use (TOU), eBill and CSS portals with the intention of greatly improving the customer experience.

2.2 Current State

2.2.1 CSS, eBill & TOU Portals

With the launch of CSS I, customers may have up to three different accounts with TH; one for the new CSS portal, one for eBill and one for the TOU portal.

To further complicate this for the customers, there are now different methods to register an account between the various portals. The TOU and eBill portals both use an e-mail registration process where the customer is e-mailed a confirmation note containing an access code. The CSS portal utilizes information about the customer and an immediate e-mail based confirmation to establish the customer identity.

Furthermore there is significant functionality overlap between the CSS and eBill portals since both present customer bills; this functionality should be consolidated into a single location.

Clearly these factors create complexity that has the potential to create massive customer confusion and therefore generate numerous calls to the call centre and greatly decrease customer use of the portals.

From a technology perspective elements of the eBill and TOU portals exist on aging, complicated and non-standard architecture. This increases the support costs incurred by the Application Support group and increases the risks of a customer impacting failure of the underlying systems. The eBill portal is built on a ColdFusion platform, one of the technologies TH is eliminating, and features integration to the customer information system, Customer Care and Billing (CC&B), eDirectory, Kubra, ePost and other systems using several different integration approaches.

At present there are approximately 50,000 commercial and residential customers who use the eBill portal to receive and view their bills. The TOU portal has over 120,000 registered users, most who do not regularly access the system, and currently has a different appearance and branding than the other portals.

Gaps	Risks	Opportunities
• Overlapping functionality • Multiple customer registration processes • Multiple security methodologies	• Extended outage due to system failure and complexity of recovery • Increase in customer complaints	• Simplification and standardization of I.T. architecture • Reduced support cost both

• Non-standard and aging architecture and technology platform	• Negative impacts to brand and reputation • Compromised security and inappropriate access to customer information	Customer Care and Information Technology • Single portal for all customer requests

2.2.2 Online Payment

The initial version of the CSS portal displays customer bills; however it does not provide the ability for the customer to make payments. The proposed online payment solution will allow customers to make bill payments using a Kubra (the outsourced bill print and storage provider) maintained link to a third party payment processing website. As mentioned above, as the bill functionality is consolidated into a single location, the ability to make online payments should also be consolidated.

Gaps	Risks	Opportunities
• Inability to make payments within the CSS portal	• Customer confusion leading to additional calls and complaints • Late or lost revenue since the customer cannot pay their bill as they desire • Negative impacts to brand and reputation	• Increase the likelihood that customers will make on time payments • Provide additional payment options to customers, for example credit card and debit card

2.2.3 Move-In New Accounts

With the introduction of CSS I, existing customers are able to perform move out and transfers online. These transactions are automatically processed by CC&B and all relevant updates to customer accounts are made without the intervention of a CSR.

Customers moving into the TH service area, who have never been customers of TH previously, may also use the website to enter the relevant information. In this case the information is not automatically processed by CC&B and must be manually entered by a CSR. This is an area of significant potential productivity improvement.

This functionality was excluded from CSS I due to the time and cost constraints on the project.

Gaps	Risks	Opportunities
• No automated processing of move-in transactions entered online	• Customer confusion leading to additional calls and complaints • Duplicated requests, through the call centre and website • Errors, rework and delay caused by manual handling of customer move requests • Potential for lost revenue due to consumption prior to account creation • Negative impacts to brand and reputation	• Improved CSR productivity • Reduction in the number of customer errors • Reduction in the number of idle accounts • Greater acceptance and use of the CSS portal

2.2.4 Lawyer Portal

In 2011 TH received over 37,000 letters from lawyers, informing TH of customer moves. These were a combination of traditional letter and facsimiles. An online form for lawyers to enter the relevant information was introduced in 2010 however like the Move-In New Account transaction, these requests are printed and processed manually.

This is an area of significant potential productivity improvement.

Gaps	Risks	Opportunities
• No automated processing of lawyer initiated move requests	• Negative impacts to brand and reputation, poor customer service due to focus on repetitive requests • Errors, rework and delay caused by manual handling of customer move requests • Potential for lost revenue due to delay in entering customer moves into CC&B	• Improved CSR productivity • Reduction in the number of customer errors • Reduction in the number of idle accounts • Greater acceptance and use of the CSS portal

2.3 Stakeholders / Requirements

This section lists the key interested parties (internal/ external) impacted by this solution. It identifies who is involved directly (as a recipient of the solution outcome) or indirectly (through integration/alignment with other programs and/or work processes), and their high level requirements for the solution to meet their expectations.

Process(es) Impacted by Solution	Process Owner (Stakeholder)	Department	Division	Requirements
Bill Payment	Chris Tyrrell	Call Centre/Accounts Receivable	Customer Care	• Ensure customers are aware and acknowledge privacy concerns related to providing password to third parties (Lowfoot, Quinzee, etc) • Provide payment option linked securely to Kubra payment application (debit and credit cards) • Populate relevant information directly into the payment form • Ensure any payment processing/credit card fee is incorporated in the Kubra transaction and not within Toronto Hydro's cost structure • Transfer between Toronto Hydro sites and Kubra payment sites should be seamless for the customer • Receive and load payment file from RBC into CC&B, process against customer accounts
Integration of CSS / eBill / TOU registration, move to	Chris Tyrrell	Call Centre/Accounts Receivable	Customer Care	• Online and immediate account registration • Default existing data held by TH into registration forms • Single account and password for all

Process(es) Impacted by Solution	Process Owner (Stakeholder)	Department	Division	Requirements
single portal single CIAM				residential customer interactions with TH • Customers and call centre representatives (CSR) to view bill inserts • Ensure that the customer is subscribed to all portals automatically • Ensure all necessary integration is enabled between CC&B and Kubra • Access TOU portal from the CSS portal for both applicable commercial and residential customers. TOU functionality to automatically be provided to all customers subject to TOU billing • Capture and confirm a single, primary email address per account • For existing eBill customers who log on once CSS II is live, additional validation is required to bring their accounts up to CIAM standards • Modifications to the TOU portal to ensure access only from CSS portal, redirect customers who access TOU directly • Provide the ability to use the CSS portal as a communication tool, for example landing page message such as changes to suite meter rate classes • CIAM will be modified to support commercial customers, portals will be available to appropriate commercial customers • Provide the ability to navigate to key functionality within other portals from the CSS portal home page (e.g. TOU alerts and PowerLens Calculator)
Bill Inquiry	Chris Tyrrell	Call Centre	Customer Care	• Update the bill presentation • Enable the customer to sign up for alerts and notifications based on cost and consumption at a customer selected threshold • Nightly process alerts and notify customer where selected threshold is exceeded • Develop necessary integration to store and retrieve information from CC&B • Provide access to historic bill inserts • Provide advanced bill presentment options such as graphs, flags and trend analysis • Provide available to opt in or out of receiving an electronic or paper bill.

Process(es) Impacted by Solution	Process Owner (Stakeholder)	Department	Division	Requirements
eBill Support	Rob Wong	Application Support	Information Technology	• Transfer the existing MIMO Oracle Forms into the CSS portal to more consistently handle move requests from customers who do not currently have a TH account • Migrate existing eBill / TOU eDirectory data to the CSS portal Active Directory system • Operate all customer self service portals without the use of eDirectory • Decommission current ebill portal
CSR Support	Chris Tyrrell	Call Centre	Customer Care	• Ensure CSRs can track the new customer interactions through the CSR interface, including view bill inserts, view payments, view bill type, etc • Update all necessary customer facing documentation (screen copy, FAQs, etc) to align with portal changes • Enable CSRs to follow customer transactions step-by-step through the CSR view
Move-In New Account	Chris Tyrrell	Call Centre	Customer Care	• Provide new customers an online tool to perform a move in; ensure all information is collected and validated • Validate the premise has been configured in CC&B and direct the customer appropriately if not • Automate the creation of the CC&B person, account and any other required elements • Complete the creation of a CCS portal account • Identify overlaps and gaps between old occupier and new occupier and enable user to resolve prior to submission • Support rapid data collection and entry, no requirement for real-time processing • Support pre and post-dated moves
Lawyer Move Request	Chris Tyrrell	Call Centre	Customer Care	• Provide move functionality consistent with existing CSS I move functionality and additional Move-In New Account functionality • Ensure necessary steps are in place to identify the lawyer performing the transaction (potential for lawyer CSS account type) – these steps should be consistent with the existing manual process • Allow for notification to law office when move transaction is completed • Automatically process transactions through CC&B and create any necessary account elements (person,

Process(es) Impacted by Solution	Process Owner (Stakeholder)	Department	Division	Requirements
				account, etc) and system transactions (service start, stop, etc)

2.4 Future State

Future State presents the vision of the desirable end state after the proposed change is implemented.

2.4.1 CSS, eBill & TOU Portals

The proposed future state sees the elimination of the multiple registration processes for each of the CSS, eBill and TOU portals. This would be replaced with the Customer Identify Access Management (CIAM) solution implemented with CSS I.

In additional the current eBill portal (Biller Direct) technology is to be decommissioned and customer information migrated to the new CSS portal. Any missing information will be captured when the customer next logs into the portal. Additional functionality will also be added to the CSS portal to allow customers to sign up for consumption and cost based alerts, pay their bills and elect to receive electronic or paper bills.

The TOU portal will no longer be a standalone portal and customers will access it from within the CSS portal.

2.4.2 Online Payment

Customers will be presented with a link to Kubra's online payment solution when viewing their bills through the CSS portal. Relevant data will be passed to the Kubra site and customers can process transactions directly from their bank accounts using debit cards or through a credit card payment. This has some similarities with the Telpay solution currently built into the Biller Direct solution.

Banking transactions will be captured by RBC, and the bank will provide TH with a nightly file for reconciliation and loading into CC&B. The design will incorporate both credit and debit card functionality, although the timing of the launch for each may differ. A service fee will be charged by the third party provider.

2.4.3 Move-In New Accounts

In the future state the Move-In New Accounts screen will not be significantly different from that which currently exists as a result of CSS I. The majority of the change will occur after the customer enters the relevant information. At this point integration and web services will be required to create the new entries within CC&B and other I.T. systems.

Included in this transaction will be the creation of a web portal account and access to the functionality included there. It is expected that no manual intervention will be required to complete the request. Where validation detects a potential or actual error, the customer will be asked to correct the data or alternatively directed to contact the call centre depending on the nature of the error.

The process will follow the identical steps to the current move-in process and must be consistent with the CSR functionality included in the CC&B Release 4 business case.

2.4.4 Lawyer Portal

The lawyer portal will operate in a very similar fashion to the move functionality in the CSS portal, including that being added in the Move-In New Accounts project and subsequent back end processing. The major difference being that the identity of the law office requesting the move must be verified to existing standards and captured for future records.

2.5 Options to Achieve Future State

This section profiles the options considered to mitigate the problem or further develop the opportunity. It describes the strategically focused choices available for integrating the problem / opportunity into the existing business environment and provides the rationale leading to the preferred solution. Detailed analysis supporting these options should be referenced here, and included in the Appendices.

2.5.1 CSS, eBill & TOU Portals

Two options were considered for addressing the three unique portals:

1) Rebuilding the eBill and TOU portals on the same technology platform, to current branding standards and decommission older technology.
2) Develop a single sign-on screen and redirect customers seamlessly to existing platforms.

Option 1 represents the ideal strategic solution however to successfully implement it requires an additional 8-12 months and an estimated additional $1.5M in capital funding. Given the current budget constraints and timeline commitments for solution delivery this is not a feasible option.

Option 2 is therefore selected for implementation. It will take the existing portals and alter the manner a customer logs onto them. This option involves modification to the CSS portal to include links to the TOU portal and the information it contains. The TOU portal would then require modification to accept the customer's credentials and automatically log them into the portal. The change to each portal is relatively minor and should be developed comparatively quickly.

The major shortcomings with option 2 related to the short term focus and inability to decommission all older technologies. That said, it will result in a customer online digital usability improvement due to the decommissioning of the old eBill portal.

2.5.2 Online Payment

At a high level two approaches were considered:

1) A complete review and enhancement of all customer payment handling at Toronto Hydro, including all channels (web, IVR, call centre, in person), and also adding debit and credit cards to the payment options.
2) Focus specifically on taking payments on the website via credit and debit cards.

While option 1 is the preferred strategic approach, to achieve the desired launch dates and budget, option 2 is the only viable approach. Option 1 is investigated as part of an overall long term strategy.

Within option 2, two alternative approaches exist. Firstly TH can develop an internal payment portal, with integration to a third party payment provider such as Moneris. The second alternative is to engage an external vendor to provide an off-the-shelf solution that meets TH's requirements. Numerous such solutions exist in the marketplace.

Given the maturity of these solutions, TH's experience with them via Telpay, the lower development cost and speed to market, the option of using an external vendor's payment solution has been selected.

Concerns with this approach are predominately around user experience and a different look and feel between the TH web pages and the external vendors pages. However it is expected that this can be addressed through branding requirements and guidelines being incorporated in the vendor contract.

2.5.3 Move-In New Accounts

From a technology and delivery perspective, no options were considered for this for the automation of the existing manual process. The technology and integration between systems has been developed in CSS I and the same approach will be used for CSS II. A consistent approach minimizes cost, delivery time, technology complexity and support requirements.

Maintaining the existing manual handling of move-in requests was considered as an option, however the requirements, productivity gains and strategic benefits of the initiative cannot be achieved without automation.

2.5.4 Lawyer Portal

The future state options for the Lawyer Portal repeat those stated above for the Move-In New Account future state options.

3 PROPOSAL DESCRIPTION

The business case from this section onwards is focused on the recommended implementation option "Proposed Solution" based on the options considered and acceptable risk. This first section outlines the solution along the following focal point sections;

3.1 Scope

3.2 Proposed Decommission of Systems

3.3 Goals and Benefit Attainment Metrics

3.1 Scope

The Scope section outlines the program deliverables. For the purpose of this business case, we need only identify basic elements of a successfully implemented solution. The five box model (people, process, and systems – leading to behavior change and sustainment) can be applied when describing the scope of work. In essence, program scope is tied to the achievement of the deliverables.

3.1.1 In scope

This section lists the key work elements that <u>will be</u> delivered as part of the responsibility commitment

Requirements	Scope
Bill Payment Process Requirements CSS / eBill / TOU Registration and Usage Process Requirements eBill Support	• **People:** No scope elements are required for the people component. • **Process:** No process changes have been factored into the business case, it is assumed that the payment reconciliation process will be unchanged from the existing TelPay reconciliation process. • **Systems:** Modifications to the new CSS portal will be required to meet the requirements and include the external link to the vendor's payment solution. Integration between various the third parties, CC&B and RBC bank will be built. Modification to CSS and CIAM to allow eBill and TOU customer to register though the new CSS portal will be required. Data migration and system flows will be built to support the migration of customers from the existing portals. Migration of existing alerts from eDirectory. Web services to/from CC&B to store and retrieve the necessary information. The various systems that currently perform the eBill functionality will be decommissioned. Navigation and minor modification to existing customer tools and alert programs to operate in conjunction with the new portal structure. • **Behaviour Change:** User training will be

Requirements	Scope
	required to ensure the new functionality is effectively supported by the CSRs. • **Sustainment:** Sustainment activities will include follow on customer communication and notification that the functionality exists.
CSR Support Process Requirements	• **People:** No scope elements are required for the people component. • **Process:** No process changes have been identified. • **Systems:** Modification to the existing CSR view to incorporate the new functionality. • **Behaviour Change:** User training will be required to ensure the new functionality is effectively utilized. • **Sustainment:** No sustainment activities identified.
Move-In New Account Requirements	• **People:** Reassignment of resources to other tasks. • **Process:** The process of printing and manually processing online move-in requests for new accounts will be halted and replaced with an entirely automated version. • **Systems:** New and modified CC&B web services and associated portal integration will be required to create the necessary account elements. Minor presentation changes to the CSS portal will be required. • **Behaviour Change:** Not applicable as the transaction will no longer be available to be performed manually. • **Sustainment:** Sustainment activities will include follow on customer communication and notification that the functionality exists.
Lawyer Portal Requirements	• **People:** Reassignment of resources to other tasks. • **Process:** The process of printing and manually processing lawyer move requests will be halted and replaced with an entirely automated version. • **Systems:** New flow and functionality is required with the portal to perform the necessary transactions from a third party, lawyer

Requirements	Scope
	perspective. Re-use of existing move functionality is expected. • **Behaviour Change:** Not applicable as the transaction will no longer be available to be performed manually. • **Sustainment:** Sustainment activities will include follow on customer communication and notification that the functionality exists.
CRQ 148973 – CSR Interface enhancements	• **People:** No people changes are expected. • **Process:** Minor process changes will result in the CSR resolving the customer issue directly rather than forwarding the call to I.T. • **Systems:** Interface will indicate the status of a registration, account number and email address will be added as search criteria and the CSR will be able to reset passwords. • **Behaviour Change:** Not applicable. • **Sustainment:** Not applicable.

Additional items related to CSS I enhancements are also in the scope of the project

CSS I Defect Number	Enhancement
95	• Handle services with multiple meters when moving in, transferring of moving out
125	• Process forced move-outs when another customer is moving into the premise
200	• Allow customers on Non-Budget Billing to fully process transactions
281	• Ensure creation of CMMIMOEX to-do in CCB only when the customer has an **arrears** balance over $300
334	• Provide additional verification options for business customers (such as property management organisations) rather than using personal information such as date of birth or drivers license number

3.1.2 Out of Scope

This section lists the key work elements that <u>will not be</u> delivered as part of the responsibility commitment

- No changes will be made to the ePost accounts or interactions. ePost is an external application run and managed by Canada Post. Bill and account information is provided to ePost by Kubra on TH's behalf. This will continue without change.
- Changes to paper or online bill presentation.
- Credit or debit card payments processed via the call centre.
- CSR use of the portal to process transactions on behalf of a customer.
- No redesign or branding changes to the eBill or TOU portals.

3.2 Proposed Decommissioning of Systems

This section lists systems that should be decommissioned after implementation of the solution

System name	Impacted Process	System Owner	Duration of overlap period after new system is implemented
eBills (CSR)	CSR Support Process	Customer Care	No overlap
eBills (Customer)	Bill Inquiry	Customer Care	No overlap
TOU Registration & Authentication	TOU Registration and Login	Customer Care	No overlap
Original MIMO portal	MIMO (transfer within province)	Customer Care	No overlap
Customer Profile (eDirectory)	Customer Data profiles	Information Technology	No overlap
Access Manager (Siteminder)	Customer Self Service Access	Information Technology	No overlap

3.3 Goals and Benefit Attainment Metrics

The Goals section profiles commitments that the solution will deliver with respect to the current state analysis baselines (section 2.2 Current State). These goals provide the foundation for defining program benefits (section 4.3 Benefits evaluation, section 7.5 Benefits attainment metric). Well defined goals contain attributes similar to the framework known as S.M.A.R.T.

S – specific (clear and well defined)

M – measurable (numeric or descriptive, and quality control)

A – agreed upon (to ensure acceptance by all parties involved)

R – relevant (useful, valuable, aligned with strategic goals)

T – time-bound (time scale, target date)

#	Goal	Description	Benefit Attainment Metrics

#	Goal	Description	Benefit Attainment Metrics
1	Cost savings: reduced cost to outsource call volume	Decrease expenses associated with outsourcing call by 1 FTE ($55,500/year) following go-live	1) Maintain payment related call volumes 5% below 2011 volumes (25,500 annually) for 5 years following go-live. 2) Maintain unknown[1] call volumes 5% below 2011 volumes (76,000 annually) for 5 years following go-live.
2	Cost savings: reduced cost to handle manual transactions	Reduce Call Centre headcount (combined internal and outsourced) by 8 FTE following go-live	1) Process 25% of 115,000 annual Move-In New Account transactions without manual intervention for 5 years following go-live. 2) Process 50% of lawyer initiated moves without manual intervention for 5 years following go-live.
3	Productivity Improvements	Reduce the number of IT incidents related to customer bills	1) Reduce the number of I.T. incidents associated with customer billing by 150 per year for the first complete year following project launch (estimated 2012 total: 1750).
4	Improve I.T. and customer data security	Improve the security design of externally facing customer systems and implement current security standards	1) No security breaches related to customer portals within 3 years of project launch.

[1] eBill/TOU portal calls are coded as 'Unknown' due to their relatively low volume

4 COST / BENEFIT ANALYSIS

This section is focused on profiling the costs associated with delivering the proposed solution, and the subsequent offsets realized in the form of financial and non-financial benefits. It outlines this perspective of the solution along the following focal point sections;

4.1 General Assumptions

4.2 Cost Estimations

4.3 Benefits Evaluation

4.4 Sensitivity Analysis

4.5 Summary

4.1 General Assumptions

Assumptions listed in this section are considered generally accepted facts at the time this business case version was approved.

- A weighted labour cost of $35/hour has been used for outsourced transactions, $51/hour for transactions performed both internally and outsourced and $75/hour for internal only transactions.
- A 4% call volume growth has been included in benefit calculations, where appropriate.
- Navigation to elements within the TOU portal can be easily achieved from the CSS portal without significant code modifications to the TOU portal – functionality remains unchanged.

4.2 Costs Estimations

This section lists the associated cost due to equipment, labor, and material estimates required to deliver the high level proposed solution. The format follows the appropriate corporate Business Case model. It will also explain how costs were determined with underlying assumptions.

Program cost summary

Project Name	Baseline Budget	
	CAPEX*	OPEX
Customer Self Service II	**$ 1,580,000**	**$ -**
CSS, eBill & TOU Portals	$ 480,000	$ -
Online Payment	$ 150,000	$ -
Move-In/New Accounts	$ 510,000	$ -
Lawyer Portal	$ 250,000	$ -
CSS I Enhancements	$ 190,000	$ -

Please refer to Appendix A for details of cost calculation per project

Overlapping systems maintenance costs

System name	System owner	Annual maintenance costs paid to vendor	Internal maintenance cost (FTE)
None identified			

4.3 Benefits Evaluation

4.3.1 Financial Benefits

Goal	Component	Assumptions	First Year Savings	5 Year Total[2] Savings
1. Cost savings: reduced cost to outsource call volume	Single CSS, eBill & TOU Portal	5% reduction in 'Unknown' call category 2011 Call Volume: 76,000 Average Call Handle Time: 10 min Labour Cost: $51/hour	$44,650	$296,000
	Online Payment	5% reduction in 'Make Payment' call category 2011 Call Volume: 25,500 Average Call Handle Time: 10 min Labour Cost: $51/hour	$10,850	$71,850
2. Cost savings: reduced cost to handle manual transactions	Move-In New Accounts	115,000 new accounts are created each year via white mail, the website and call centre. 25% of these (14,000) will be diverted to the website and processed without manual intervention Average Handle Time: 15 min Labour Cost: $51/hour	$366,500	$2,431,400
	Lawyer Portal	On average 35,000 lawyer-initiated move requests have been received over the last 4 years. 50% (17,500) will be diverted to the website and processed without manual intervention Average Handle Time: 15 min Labour Cost: $51/hour	$223,000	$1,338,750

[2] 5 Year Total includes 4% annual call volume growth, not discounted

Goal	Component	Assumptions	First Year Savings	5 Year Total[2] Savings
3. Productivity Improvements 4. Improve I.T. and customer data security	Single CSS, eBill & TOU Portal	Avoid the replacement cost and associated labour costs associated with the end-of-life eBill server infrastructure. Server hardware CAPEX, 8 servers: $66,000 Server hardware maintenance cost OPEX: $12,000 (annually) Software purchase CAPEX, 8 servers: $62,000 Software maintenance cost OPEX: $12,000 (annually) Server hardware and software installation labour: 5 FTE for 50 hours each at $100 per hour	$172,000	$292,000
		Reduce I.T. eBill related support costs. 3 incidents per week, averaging 10 hours (3 people) at $100 per hour	$54,600	$327,600

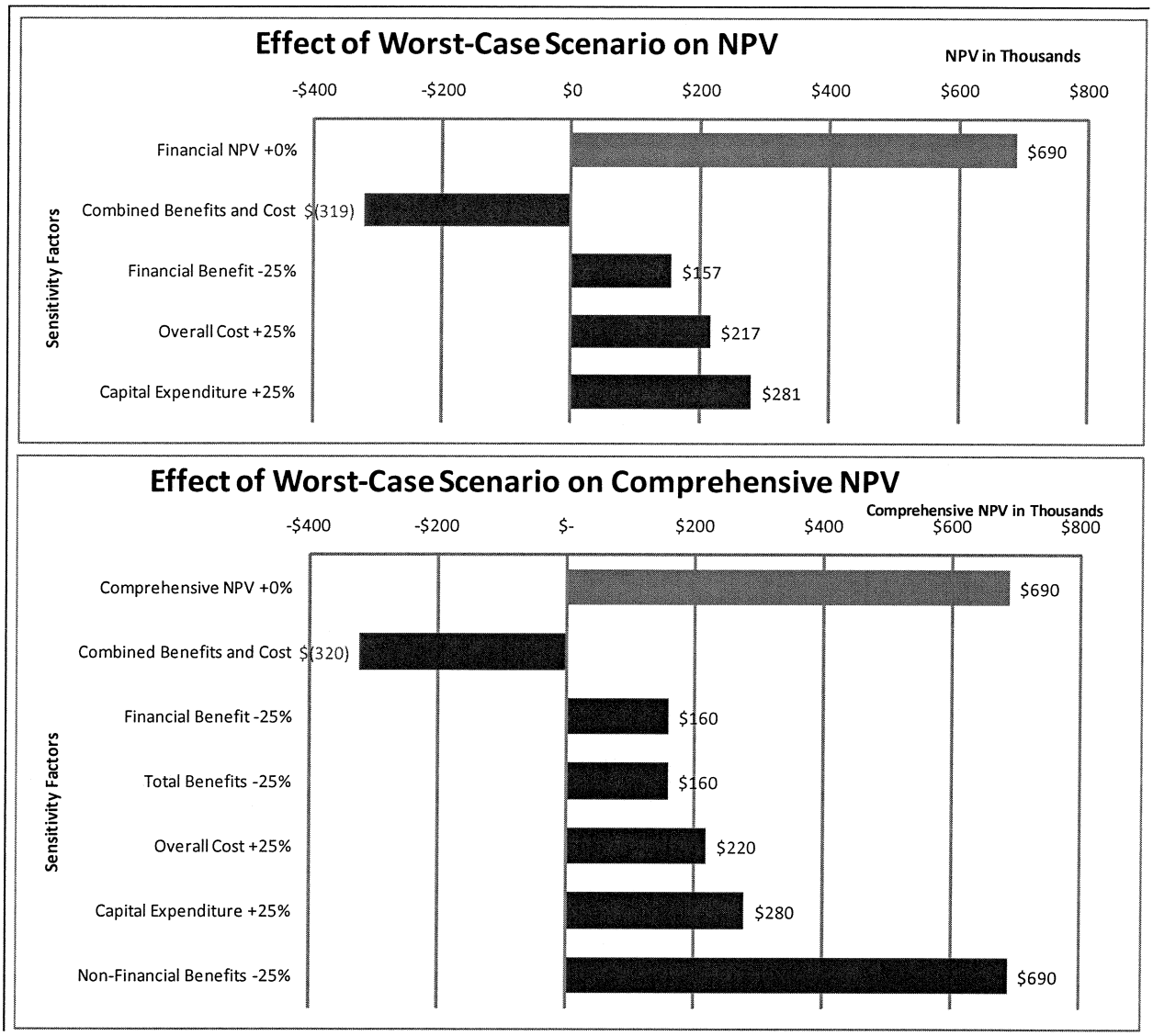
4.3.2 Non-Financial Benefits

Other benefits that TH will obtain from the delivery of this business case include:

- Significantly improved customer data security, with industry leading and easy to use security toolset; single website security model;
- Decommissioning of end-of-life and unsupported hardware and software; simplification of the I.T. environment with a reduced number of applications requiring support;
- Improved customer satisfaction through greater access to TH services, specifically enhancements to 24/7 service account management convenience;
- Improved customer awareness of electricity consumption patterns;
- Potential to significantly increase tier ranking in 2013 eSource North American Utility Website survey (currently ranked in Tier 3); and
- Increased digital engagement on Toronto Hydro website due to integrated online experience, resulting in higher awareness of Toronto Hydro programs and services (i.e. conservation and demand management).

4.4 Sensitivity Analysis

This section provides a sensitivity analysis of the program based on cost projections and benefits realization. Both costs and benefits have a -25% sensitivity to illustrate the worst-case scenario. The analysis will ensure confidence in the programs' efficiency, and will be done with the corporate Business Case model. A list of program criteria is included to reflect the sensitivity analysis.



4.5 Summary

The summary section summarizes the net cost / benefit outcome anticipated by the delivery of this solution as profiled in the sections above. It provides an input to proposal efficiency check and prioritization model.

Investment Total		
Net Capital Invested	$	(1,700,000)
Chargeable (program capital budget)	$	(1,580,000)
Non-chargeable time	$	(120,000)

Total Corporate Value		
Comprehensive Net Present Value (all costs, all benefits)	$	690,000

Total Cash Value		
Net Present Value (all costs, cash benefits only)	$	690,000

Dollar-Equivalent Non-Cash Benefits		
Productivity (time saving, increased throughput, etc.)	$	0
Carbon Savings	$	0
Reliability Improvements	$	0
Community Contributions	$	0

Other Prioritization Criteria	
Internal Rate of Return	22.04%
Payback Period	4.31 years
Strategic Alignment Score	
KPI Alignment	No Alignment
Pillar Alignment	No Alignment
Risk Alignment Score	9

5 STRATEGIC ALIGNMENT

This section gives a descriptive account of how this program will contribute to strengthening our corporate strategic pillars, and if possible, determine the impact on the pillars through the KPIs.

The four Corporate Pillars are:

- **Customer Service Pillar:** Value for money
- **Operations Pillar:** Improve reliability though optimal and sustainable system management
- **People Pillar:** Fully-engaged, safe and healthy workforce that meets the changing business requirements
- **Financial Strength Pillar:** Meet financial objectives of the Shareholder

Strategic Alignment Summary			
Pillar	*KPI Alignment*	*Pillar Alignment*	*Rationale*
Customer Pillar	*High Alignment*	*High Alignment*	*Enhanced customer self-service will lead customers to use the portal and directly impact the ECE metric. This in turn has benefits for the Service Response metric. Significantly improved customer experience*
Operations Pillar	*No Alignment*	*No Alignment*	*No alignment to Operations pillar or related KPIs*
People Pillar	*No Alignment*	*No Alignment*	*No alignment to People pillar or related KPIs*
Financial Pillar	*Some Alignment*	*Some Alignment*	*Provides Cost avoidance by allowing customers to utilize less expensive channels and increases likelihood of customers paying on time reducing arrears*
Overall Strategic Alignment Assessment	***No Alignment***	***No Alignment***	***Focused Customer Care initiative and provides cost avoidance***

6 RISK ALIGNMENT / IMPACT ANALYSIS

The CSS II project has not been created to directly address any enterprise risks; however it does have the benefit of reducing the exposure to two of the enterprise risks.

- Information Technology: this risk exposure is reduced as a result of the decommissioning of aging eBills, ColdFusion and other supporting technologies. A new solution, aligned with corporate standards ensures a lower total cost of ownership. The reliability of the solution is also greatly improved.
- Cyber Security: with the launch of CSS I, online customer security is split between two different processes, across multiple accounts and in some instances involves manual, paper-based steps. CSS II introduces a consolidated, automated and industry standard security solution. This in turn reduces the likelihood of Toronto Hydro systems being electronically compromised.

Risk Alignment Summary

Risk Area	Initiative reduces Risk exposure (YES/NO)	Initiative increases Risk exposure (YES/NO)	Overall Risk Category Rationale Summary
Operations	Yes	No	This project reduces the Operations risk exposure through replacement of aging, disjointed technology and improves the online security model
Finance	No	No	This project does not change the Finance area risk exposure
People	No	No	This project does not change the People area risk exposure
Strategy	No	No	This project does not change the Strategy area risk exposure
External	No	No	This project does not chang ethe External area risk exposure

7 IMPLEMENTATION APPROACH

This section is focused on profiling the approach associated with delivering the proposed solution. It outlines this perspective of the solution along the following focal point sections;

7.1 Implementation Strategy and High-Level Timeline
7.2 Execution Risks and Critical Success Factors
7.3 Accountabilities
7.4 Execution Success Metrics
7.5 Metrics to Measure Benefits Attainment

7.1 Implementation Strategy and High-level Timeline

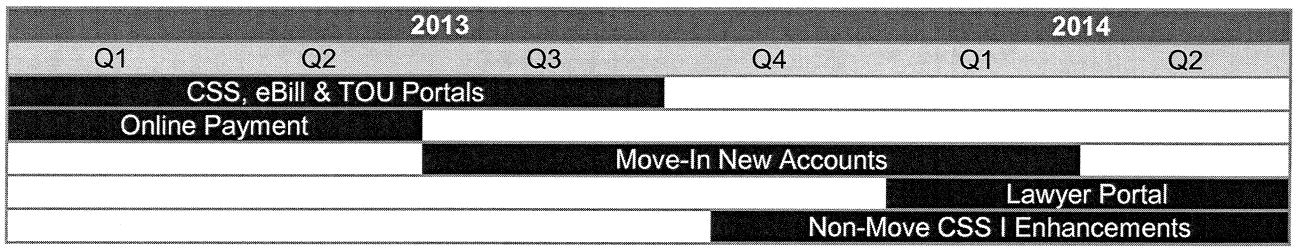
The four components of this business case; CSS, eBill & TOU Portals, Online Payment, Move-In New Account and Lawyer Portal will be delivered as four projects. The CSS I enhancements will be incorporated into the Move-In stream where appropriate and those remaining will be treated as a separate stream.

Splitting the work lowers the risks to delivery by creating manageable work volumes and business changes. It also allows greater flexibility in adjusting to a changing business environment.

The Lawyer Portal is positioned after the Move-In New Account project since that functionality will also be included in the Lawyer Portal and this sequence minimizes rework and testing.

The project deliverables have been split across years to spread the impact to the overall I.T. capital portfolio.

The table below contains an initial timeline for the project as of the time of writing the business case. Its primary use is to estimate project cost however it also illustrates expected durations. Delivery date commitments will be provided by the project delivery team and recorded in project planning documents.



7.2 Execution Risks and Critical Success Factors

The following are critical success factors for the project and the risks associated with achieving each of them:

- **Project Cost and Timelines:** Development of project deliverables is likely to involve external vendors; this creates a risk for the project and its ability to deliver on time and budget. This risk will be mitigated by using vendors that have a working relationship with TH and through the use of contract tools such as fixed price commitments and formal quality measurement.
- **Transfer of commercial customers to portal based solution:** The original CSS design parameters cover residential accounts only, with the proposed changes commercial customers will also be included. This creates a risk to the project's cost, schedule and quality assumptions should this create unforeseen complexity. This has been addressed through pre-business case investigation by the current CSS development vendors.
- **Decommissioning of aging technology:** Many of the project benefits are as a result of decommissioning a portion of the aging technology installed at TH. There is a risk to targeted project benefits if the technology cannot be decommissioned. The project will develop detailed requirements early in the project to ensure that there is sufficient lead-time to address this risk.

7.3 Accountabilities

Accountabilities and responsibilities of stakeholders in the solution delivery:

Stakeholder title	Role	Responsibilities
C. Tyrrell	Sponsor	• Program sponsorship • Primary business case approval
R. Wong	Co-Sponsor	• Sign-Off Business Case • Provide support resources for Business Case creation and project execution • Support technology solution following launch
L. Kirk	Stakeholder Manager	• Provide Call Centre strategy and direction • Provide Call Centre Supervisor resources • Sign-Off Business Case, Requirements, Design, Training and Implementation • Provide prioritization, delivery direction and departmental alignment
E. Page	Stakeholder Manager	• Provide Accounts Receivable strategy and direction • Provide Accounts Receivable Supervisor resources
C. Floriano R. Eveleigh	Manager	• Sign-Off Requirements, Infrastructure, Training and Implementation • Establish ongoing support structure, knowledge and skills
A. Policicchio	Manager	• Governance of program
S. Jacka	Enterprise Architect	• Approve Architecture Documents • Validate final solution for compliance with corporate technology standards
W. Tichbon	Project Leader	• Development and support of business case • Coordinate program dependencies during business case development
T.B.D.	Project Leader	• Management of project delivery team and plans • Preparation of reporting material • Management of project scope

7.4 Execution Success Metrics

The metrics stated in this section are proxies to gauge efficiency of the solution towards achieving the expected goals. They are used by the project leader to report progress and success during solution delivery.

ID	Metric Name	Target	Formula	Realization Timing	Owner
1	Maintain progress of project in accordance with the plan for each of the project streams				
1.1	E&C Stream KPI	Achieve or exceed the planned number of activities	# of E&C Stream activities complete / Total # E&C Stream activities in project schedule	Planned Stream End Date	I.T. Project Management
1.2	Business Stream KPI	Achieve or exceed the planned number of activities	# of Business Stream activities complete / Total # Business Stream activities in project schedule	Planned Stream End Date	I.T. Project Management
1.3	IT Support Stream KPI	Achieve or exceed the planned number of activities	# of IT Support Stream activities complete / Total # IT Support Stream activities in project schedule	Planned Stream End Date	I.T. Project Management
1.4	IT Technical Stream KPI	Achieve or exceed the planned number of activities	# of IT Technical Stream activities complete / Total # IT Technical Stream activities in project schedule	Planned Stream End Date	I.T. Project Management

7.5 Metrics to Measure Benefits Attainment

The metrics stated in this section are designated to track post implementation benefit realization (responsibility of project owners / beneficiaries). They would correlate to the benefits evaluation in section 0 and be aligned with the goals stated in section 3.2. Additional details, such as targets for each period, should be included to provide the ability to monitor and assess their realization during the stages of solution delivery.

- Project Goal: A description of what the program wants to achieve (see Section 3.2)
- Metric Name: Name of the measure used to track performance
- Formula: Formula used or other means to identify performance
- Realization Timing: The start date and performance timeline to full benefit realization
- Beneficiary: The stakeholder (Division / Department) with responsibility for sustaining the benefit once the enabling system, people, and process deliverables are complete and accepted

All realization timing entries in this section assume the project is delivered according to the very high-level timeline present in section 7.1. Changes to this timeline will also need to be reflected in the expected realization timing captured below.

ID	Metric Name	Formula	**Target overall**	Realization Timing	Beneficiary
Goal 1: Cost savings; reduced cost to outsource call volume					

ID	Metric Name	Formula	**Target overall**	Realization Timing	Beneficiary
1.1	Make Payment	Call Activity Report 'Collections – Make Payment' category call volume (2011: 25,500)	24,225 25,200 26,200 27,250 28,350	2014 2015 2016 2017 2018	Call Centre
1.2	eBill/TOU	Call Activity Report 'Unknown' category call volume (2011: 76,000)	72,200 75,100 78,100 81,225 84,500	2014 2015 2016 2017 2018	Call Centre
Goal 2: Cost savings; reduced cost to manual transactions					
2.1	Move-In New Account	Number of Online Move-In New Account transactions / Total Move-In New Account transactions	25%	2014-2018	Call Centre
2.2	Lawyer Portal	Number of online lawyer move transactions / total lawyer move transactions	50%	2014-2018	Call Centre
Goal 3: Productivity Improvements					
3.1	I.T. support calls	Total of 2014 incidents related to electronic bills (2012 estimate: 1750)	750	2014	Application Support
Goal 4: Improve I.T. and customer data security					
4.1	Customer data security	Number of externally initiated customer data security incidents	0	2013 to 2015	Application Support

The following section breaks the metrics down by project to show the contribution made by each project.

7.5.1 CSS, eBill & TOU Portal Targets

ID	Metric Name	Formula	**Project Target**	Realization Timing	Beneficiary
Goal 1: Cost savings; reduced cost to outsource call volume					
1.1	Make Payment	Call Activity Report 'Collections – Make Payment'	N/A	2014 2015	Call Centre

ID	Metric Name	Formula	**Project Target**	Realization Timing	Beneficiary
		category call volume (2011: 25,500)		2016 2017 2018	
1.2	eBill/TOU	Call Activity Report 'Unknown' category call volume (2011: 76,000)	72,200 75,100 78,100 81,225 84,500	2014 2015 2016 2017 2018	Call Centre
Goal 2: Cost savings; reduced cost to manual transactions					
2.1	Move-In New Account	Number of Online Move-In New Account transactions / Total Move-In New Account transactions	N/A	2014-2018	Call Centre
2.2	Lawyer Portal	Number of online lawyer move transactions / total lawyer move transactions	N/A	2014-2018	Call Centre
Goal 3: Productivity Improvements					
3.1	I.T. support calls	Total of 2014 incidents related to electronic bills (2012 estimate: 1750)	750	2014	Application Support
Goal 4: Improve I.T. and customer data security					
4.1	Customer data security	Number of externally initiated customer data security incidents	0	2013 to 2015	Application Support

7.5.2 Online Payment Targets

ID	Metric Name	Formula	**Project Target**	Realization Timing	Beneficiary
Goal 1: Cost savings; reduced cost to outsource call volume					
1.1	Make Payment	Call Activity Report 'Collections – Make Payment' category call volume (2011: 25,500)	24,225 25,200 26,200 27,250 28,350	2014 2015 2016 2017 2018	Call Centre

ID	Metric Name	Formula	**Project Target**	Realization Timing	Beneficiary
1.2	eBill/TOU	Call Activity Report 'Unknown' category call volume (2011: 76,000)	N/A	2014 2015 2016 2017 2018	Call Centre
Goal 2: Cost savings; reduced cost to manual transactions					
2.1	Move-In New Account	Number of Online Move-In New Account transactions / Total Move-In New Account transactions	N/A	2014-2018	Call Centre
2.2	Lawyer Portal	Number of online lawyer move transactions / total lawyer move transactions	N/A	2014-2018	Call Centre
Goal 3: Productivity Improvements					
3.1	I.T. support calls	Total of 2014 incidents related to electronic bills (2012 estimate: 1750)	N/A	2014	Application Support
Goal 4: Improve I.T. and customer data security					
4.1	Customer data security	Number of externally initiated customer data security incidents	N/A	2013 to 2015	Application Support

7.5.3 Move-In New Account Targets

ID	Metric Name	Formula	**Project Target**	Realization Timing	Beneficiary
Goal 1: Cost savings; reduced cost to outsource call volume					
1.1	Make Payment	Call Activity Report 'Collections – Make Payment' category call volume (2011: 25,500)	N/A	2014 2015 2016 2017 2018	Call Centre

ID	Metric Name	Formula	**Project Target**	Realization Timing	Beneficiary
1.2	eBill/TOU	Call Activity Report 'Unknown' category call volume (2011: 76,000)	N/A	2014 2015 2016 2017 2018	Call Centre
Goal 2: Cost savings; reduced cost to manual transactions					
2.1	Move-In New Account	Number of Online Move-In New Account transactions / Total Move-In New Account transactions	25%	2014-2018	Call Centre
2.2	Lawyer Portal	Number of online lawyer move transactions / total lawyer move transactions	N/A	2014-2018	Call Centre
Goal 3: Productivity Improvements					
3.1	I.T. support calls	Total of 2014 incidents related to electronic bills (2012 estimate: 1750)	N/A	2014	Application Support
Goal 4: Improve I.T. and customer data security					
4.1	Customer data security	Number of externally initiated customer data security incidents	N/A	2013 to 2015	Application Support

7.5.4 Lawyer Portal Targets

ID	Metric Name	Formula	**Project Target**	Realization Timing	Beneficiary
Goal 1: Cost savings; reduced cost to outsource call volume					
1.1	Make Payment	Call Activity Report 'Collections – Make Payment' category call volume (2011: 25,500)	N/A	2014 2015 2016 2017 2018	Call Centre

ID	Metric Name	Formula	**Project Target**	Realization Timing	Beneficiary
1.2	eBill/TOU	Call Activity Report 'Unknown' category call volume (2011: 76,000)	N/A	2014 2015 2016 2017 2018	Call Centre
Goal 2: Cost savings; reduced cost to manual transactions					
2.1	Move-In New Account	Number of Online Move-In New Account transactions / Total Move-In New Account transactions	N/A	2014-2018	Call Centre
2.2	Lawyer Portal	Number of online lawyer move transactions / total lawyer move transactions	50%	2014-2018	Call Centre
Goal 3: Productivity Improvements					
3.1	I.T. support calls	Total of 2014 incidents related to electronic bills (2012 estimate: 1750)	N/A	2014	Application Support
Goal 4: Improve I.T. and customer data security					
4.1	Customer data security	Number of externally initiated customer data security incidents	N/A	2013 to 2015	Application Support

8 APPENDICES

8.1 Appendix A: Program Cost Details

8.1.1 Project 1 - CSS, eBill & TOU Portals

Chargeable labour costs

Project 1 -Chargeable Labour		Number of SMEs	% of utilization	Rate per hour	Duration of participation (month)	Hours	Cost
SW labour	External Quot	4.00	85%	$100	5.00	2,380	$ 238,000
	Proj Mgmt	2.00	50%	$100	5.00	700	$ 70,000
	BA	1.00	33%	$90	5.00	231	$ 20,790
	Developer	1.00	50%	$90	5.00	350	$ 31,500
	QA Spec	1.00	25%	$80	5.00	175	$ 14,000
	External Extir	2.00	50%	$150	5.00	700	$ 105,000
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL SW labour						**$ 479,290**
HW labour	Role 1					-	$ -
	Role 2					-	$ -
	Role 3					-	$ -
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL HW labour						**$ -**

Non-chargeable labour costs

Project 1 -Non-chargeable Labour		Number of SMEs	% of utilization	Rate per hour	Duration of participation (month)	Hours	Cost
SW labour	Bus Mgr	1.00	10%	$120	5.00	70	$ 8,400
	SME	1.00	25%	$100	4.00	140	$ 14,000
	Tester	1.00	25%	$70	3.00	105	$ 7,350
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL SW labour						**$ 29,750**
HW labour	Role 1					-	$ -
	Role 2					-	$ -
	Role 3					-	$ -
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL HW labour						**$ -**

Computer equipment and Software application costs

Project 1 -Equipment		Number of units	Price per unit	Cost
SW application	Enterprise SW			$ -
	Client SW			$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
	TOTAL SW application			**$ -**
HW Equipment	Client Devices HW			$ -
	Network HW			$ -
	Printer HW			$ -
	Storage HW			$ -
	Telecom HW			$ -
	Radio HW			$ -
	Servers: P series HW			$ -
	Servers: X86 HW			$ -
				$ -
				$ -
	TOTAL HW equipment			**$ -**

Chargeable Operating costs

Project 1 - chargeable operating cost	Number of SMEs	Rate per hour	Number of Hours	Cost
Trainings				$ -
Op cost 2				$ -
Op cost 3				$ -
Op cost 4				$ -
Op cost 5				$ -
Op cost 6				$ -
Op cost 7				$ -
Op cost 8				$ -
Op cost 9				$ -
Op cost 10				$ -
Total Operating Cost				-

Non-chargeable Operating costs

Project 1 - non-chargeable operating cost	Number of SMEs	Rate per hour	Number of Hours	Cost
Trainings				$ -
Op cost 2				$ -
Op cost 3				$ -
Op cost 4				$ -
Op cost 5				$ -
Op cost 6				$ -
Op cost 7				$ -
Op cost 8				$ -
Op cost 9				$ -
Op cost 10				$ -
Total Operating Cost				-

8.1.2 Project 2 - Online Payment

Chargeable labour costs

Project 2 -Chargeable Labour		Number of SMEs	% of utilization	Rate per hour	Duration of participation (month)	Hours	Cost
SW labour	External Quot	3.00	35%	$100	5.00	735	$ 73,500
	Proj Mgmt	2.00	25%	$100	5.00	350	$ 35,000
	BA	1.00	25%	$90	5.00	175	$ 15,750
	Developer	1.00	25%	$90	5.00	175	$ 15,750
	QA Spec	1.00	25%	$80	5.00	175	$ 14,000
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL SW labour						**$ 154,000**
HW labour	Role 1					-	$ -
	Role 2					-	$ -
	Role 3					-	$ -
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL HW labour						**$ -**

Non-chargeable labour costs

Project 2 -Non-chargeable Labour		Number of SMEs	% of utilization	Rate per hour	Duration of participation (month)	Hours	Cost
SW labour	Bus Mgr	1.00	10%	$120	5.00	70	$ 8,400
	SME	1.00	25%	$100	4.00	140	$ 14,000
	Tester	1.00	25%	$70	3.00	105	$ 7,350
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL SW labour						**$ 29,750**
HW labour	Role 1					-	$ -
	Role 2					-	$ -
	Role 3					-	$ -
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL HW labour						**$ -**

Computer equipment and Software application costs

Project 2 -Equipment		Number of units	Price per unit	Cost
SW application	Enterprise SW			$ -
	Client SW			$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
	TOTAL SW application			**$ -**
HW Equipment	Client Devices HW			$ -
	Network HW			$ -
	Printer HW			$ -
	Storage HW			$ -
	Telecom HW			$ -
	Radio HW			$ -
	Servers: P series HW			$ -
	Servers: X86 HW			$ -
				$ -
				$ -
	TOTAL HW equipment			**$ -**

Chargeable Operating costs

Project 2 - chargeable operating cost	Number of SMEs	Rate per hour	Number of Hours	Cost
Trainings				$ -
Op cost 2				$ -
Op cost 3				$ -
Op cost 4				$ -
Op cost 5				$ -
Op cost 6				$ -
Op cost 7				$ -
Op cost 8				$ -
Op cost 9				$ -
Op cost 10				$ -
Total Operating Cost				-

Non-chargeable Operating costs

Project 2 - non-chargeable operating cost	Number of SMEs	Rate per hour	Number of Hours	Cost
Trainings				$ -
Op cost 2				$ -
Op cost 3				$ -
Op cost 4				$ -
Op cost 5				$ -
Op cost 6				$ -
Op cost 7				$ -
Op cost 8				$ -
Op cost 9				$ -
Op cost 10				$ -
Total Operating Cost				-

8.1.3 Project 3 - Move-In New Account

Chargeable labour costs

Project 3 -Chargeable Labour		Number of SMEs	% of utilization	Rate per hour	Duration of participation (month)	Hours	Cost
SW labour	External Quot	5.00	75%	$100	6.00	3,150	$ 315,000
	Proj Mgmt	2.00	60%	$100	6.00	1,008	$ 100,800
	BA	1.00	33%	$90	6.00	277	$ 24,948
	Developer	1.00	25%	$90	6.00	210	$ 18,900
	QA Spec	1.00	25%	$80	6.00	210	$ 16,800
	External Estir	1.00	20%	$100	6.00	168	$ 16,800
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL SW labour						**$ 493,248**
HW labour	Infrastructure	1.00	25%	$90	6.00	210	$ 18,900
	Role 2					-	$ -
	Role 3					-	$ -
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL HW labour						**$ 18,900**

Non-chargeable labour costs

Project 3 -Non-chargeable Labour		Number of SMEs	% of utilization	Rate per hour	Duration of participation (month)	Hours	Cost
SW labour	Bus Mgr	1.00	10%	$120	6.00	84	$ 10,080
	SME	1.00	25%	$100	5.00	175	$ 17,500
	Tester	1.00	25%	$70	4.00	140	$ 9,800
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL SW labour						**$ 37,380**
HW labour	Role 1					-	$ -
	Role 2					-	$ -
	Role 3					-	$ -
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL HW labour						**$ -**

Computer equipment and Software application costs

Project 3 -Equipment		Number of units	Price per unit	Cost
SW application	Enterprise SW			$ -
	Client SW			$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
	TOTAL SW application			**$ -**
HW Equipment	Client Devices HW			$ -
	Network HW			$ -
	Printer HW			$ -
	Storage HW			$ -
	Telecom HW			$ -
	Radio HW			$ -
	Servers: P series HW			$ -
	Servers: X86 HW			$ -
				$ -
				$ -
	TOTAL HW equipment			**$ -**

Chargeable Operating costs

Project 3 - chargeable operating cost	Number of SMEs	Rate per hour	Number of Hours	Cost
Trainings				$ -
Op cost 2				$ -
Op cost 3				$ -
Op cost 4				$ -
Op cost 5				$ -
Op cost 6				$ -
Op cost 7				$ -
Op cost 8				$ -
Op cost 9				$ -
Op cost 10				$ -
Total Operating Cost				-

Non-chargeable Operating costs

Project 3 - non-chargeable operating cost	Number of SMEs	Rate per hour	Number of Hours	Cost
Trainings				$ -
Op cost 2				$ -
Op cost 3				$ -
Op cost 4				$ -
Op cost 5				$ -
Op cost 6				$ -
Op cost 7				$ -
Op cost 8				$ -
Op cost 9				$ -
Op cost 10				$ -
Total Operating Cost				-

8.1.4 Project 4 - Lawyer Portal

Chargeable labour costs

Project 4 -Chargeable Labour		Number of SMEs	% of utilization	Rate per hour	Duration of participation (month)	Hours	Cost
SW labour	External Quot	3.00	70%	$100	4.00	1,176	$ 117,600
	Proj Mgmt	2.00	40%	$100	4.00	448	$ 44,800
	BA	1.00	33%	$90	4.00	185	$ 16,632
	Developer	1.00	25%	$90	4.00	140	$ 12,600
	QA Spec	1.00	25%	$80	4.00	140	$ 11,200
	External Estir	3.00	20%	$100	4.00	336	$ 33,600
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL SW labour						**$ 236,432**
HW labour	Infrastructure	1.00	25%	$90	4.00	140	$ 12,600
	Role 2					-	$ -
	Role 3					-	$ -
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL HW labour						**$ 12,600**

Non-chargeable labour costs

Project 4 -Non-chargeable Labour		Number of SMEs	% of utilization	Rate per hour	Duration of participation (month)	Hours	Cost
SW labour	Bus Mgr	1.00	10%	$120	4.00	56	$ 6,720
	SME	1.00	25%	$100	3.00	105	$ 10,500
	Tester	1.00	25%	$70	2.00	70	$ 4,900
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL SW labour						**$ 22,120**
HW labour	Role 1					-	$ -
	Role 2					-	$ -
	Role 3					-	$ -
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL HW labour						**$ -**

Computer equipment and Software application costs

Project 3 -Equipment		Number of units	Price per unit	Cost
SW application	Enterprise SW			$ -
	Client SW			$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
	TOTAL SW application			**$ -**
HW Equipment	Client Devices HW			$ -
	Network HW			$ -
	Printer HW			$ -
	Storage HW			$ -
	Telecom HW			$ -
	Radio HW			$ -
	Servers: P series HW			$ -
	Servers: X86 HW			$ -
				$ -
				$ -
	TOTAL HW equipment			**$ -**

Chargeable Operating costs

Project 3 - chargeable operating cost	Number of SMEs	Rate per hour	Number of Hours	Cost
Trainings				$ -
Op cost 2				$ -
Op cost 3				$ -
Op cost 4				$ -
Op cost 5				$ -
Op cost 6				$ -
Op cost 7				$ -
Op cost 8				$ -
Op cost 9				$ -
Op cost 10				$ -
Total Operating Cost				-

Non-chargeable Operating costs

Project 3 - non-chargeable operating cost	Number of SMEs	Rate per hour	Number of Hours	Cost
Trainings				$ -
Op cost 2				$ -
Op cost 3				$ -
Op cost 4				$ -
Op cost 5				$ -
Op cost 6				$ -
Op cost 7				$ -
Op cost 8				$ -
Op cost 9				$ -
Op cost 10				$ -
Total Operating Cost				-

8.1.5 Project 5 – Remaining CSS I Enhancements

Chargeable labour costs

Project 5 -Chargeable Labour		Number of SMEs	% of utilization	Rate per hour	Duration of participation (month)	Hours	Cost
SW labour	Navantis	3.00	50%	$180	2.00	420	$ 75,600
	Oracle	1.25	50%	$150	2.00	175	$ 26,250
	PM/PL	2.00	50%	$100	2.00	280	$ 28,000
	BA	1.00	100%	$90	2.00	280	$ 25,200
	Developer	1.00	50%	$90	2.00	140	$ 12,600
	QA	1.00	50%	$80	2.00	140	$ 11,200
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL SW labour						**$ 178,850**
HW labour	Infrastructure	1.00	25%	$90	2.00	70	$ 6,300
	Role 2					-	$ -
	Role 3					-	$ -
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL HW labour						**$ 6,300**

Non-chargeable labour costs

Project 5 -Non-chargeable Labour		Number of SMEs	% of utilization	Rate per hour	Duration of participation (month)	Hours	Cost
SW labour	Role 1					-	$ -
	Role 2					-	$ -
	Role 3					-	$ -
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL SW labour						**$ -**
HW labour	Role 1					-	$ -
	Role 2					-	$ -
	Role 3					-	$ -
	Role 4					-	$ -
	Role 5					-	$ -
	Role 6					-	$ -
	Role 7					-	$ -
	Role 8					-	$ -
	Role 9					-	$ -
	Role 10					-	$ -
	TOTAL HW labour						**$ -**

Computer equipment and Software application costs

Project 5 -Equipment		Number of units	Price per unit	Cost
SW application	Enterprise SW			$ -
	Client SW			$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
				$ -
	TOTAL SW application			**$ -**
HW Equipment	Client Devices HW			$ -
	Network HW			$ -
	Printer HW			$ -
	Storage HW			$ -
	Telecom HW			$ -
	Radio HW			$ -
	Servers: P series HW			$ -
	Servers: X86 HW			$ -
				$ -
				$ -
	TOTAL HW equipment			**$ -**

Chargeable Operating costs

Project 5 - chargeable operating cost	Number of SMEs	Rate per hour	Number of Hours	Cost
Trainings				$ -
Op cost 2				$ -
Op cost 3				$ -
Op cost 4				$ -
Op cost 5				$ -
Op cost 6				$ -
Op cost 7				$ -
Op cost 8				$ -
Op cost 9				$ -
Op cost 10				$ -
Total Operating Cost				-

Non-chargeable Operating costs

Project 5 - non-chargeable operating cost	Number of SMEs	Rate per hour	Number of Hours	Cost
Trainings				$ -
Op cost 2				$ -
Op cost 3				$ -
Op cost 4				$ -
Op cost 5				$ -
Op cost 6				$ -
Op cost 7				$ -
Op cost 8				$ -
Op cost 9				$ -
Op cost 10				$ -
Total Operating Cost				-

8.2 Appendix B: Detailed Financial Summary[3]

This section will include a detailed breakdown of financial and dollar-equivalent non-financial benefits and of costs and capital investments made and used in this program (see also following page)

Financial Cashflows		YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20	YEAR 21	YEAR 22	YEAR 23	YEAR 24	YEAR 25	YEAR 26
Capital Cash Flow																												
Distribution System Assets	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Buildings	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Computer Equipment	$ K	(38)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Applications Software	$ K	(1,661)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rolling Stock	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Leasehold Improvements	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Office Equipment	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Land	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Capital Expenditures	$ K	(1,699)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Capital Offsets	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Capital Cash Flow	**$ K**	**(1,699)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Operating Cash Flow																												
Revenue	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Revenue Loss Avoidance	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cost Avoidance	$ K	-	172	24	24	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cost Savings	$ K	-	189	795	812	830	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Financial Benefits	**$ K**	**-**	**361**	**819**	**836**	**854**	**872**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Labour	$ K	-	(88)	(88)	(88)	(88)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Contractor	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Material	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Equipment	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maintainence	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Repair	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Operating Costs	**$ K**	**-**	**(88)**	**(88)**	**(88)**	**(88)**	**(88)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Net Operating Cash Flow	**$ K**	**-**	**273**	**731**	**748**	**766**	**785**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total Cash Flow																												
Net Capital Cash Flow	$ K	(1,699)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Operating Cash Flow	$ K	-	273	731	748	766	785	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Taxes	$ K	-	(77)	(207)	(211)	(216)	(222)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCA Tax Shield	$ K	237	238	2	1	0.620	0.341	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Net Cash Flow	$ K	(1,462)	434	527	538	550	563	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discount Factors		1.03	1.09	1.16	1.23	1.31	1.39	1.48	1.57	1.67	1.77	1.88	1.99	2.12	2.25	2.39	2.53	2.69	2.86	3.03	3.22	3.42	3.63	3.86	4.09	4.35	4.62	4.90
Discounted Cash Flow	**$ K**	**(1,418)**	**397**	**453**	**436**	**420**	**405**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Financial Summary																												
Net Present Value	**$**	**693,006**																										
Internal Rate of Return	**%**	**22.04%**																										
Payback Period	**Years**	**4.31**																										

[3] Insert project financial tables as required

Dollar-Equivalent Non-Financial Benefits		YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	YEAR 11	YEAR 12	YEAR 13	YEAR 14	YEAR 15	YEAR 16	YEAR 17	YEAR 18	YEAR 19	YEAR 20	YEAR 21	YEAR 22	YEAR 23	YEAR 24	YEAR 25	YEAR 26	YEAR 27
Productivity Benefits																												
Productivity Benefits 1	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Productivity Benefits 2	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Productivity Benefits 3	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Productivity Benefits 4	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Productivity Benefits 5	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Productivity Benefits 6	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Productivity Benefits 7		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Productivity Benefits 8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Savings	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discount Factors		0.97	1.03	1.09	1.16	1.23	1.31	1.39	1.48	1.57	1.67	1.77	1.88	1.99	2.12	2.25	2.39	2.53	2.69	2.86	3.03	3.22	3.42	3.63	3.86	4.09	4.35	4.62
Discounted Savings	**$ K**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon Savings																												
SF6 Leak	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Line Losses	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Facilities Electricity Usage	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Facilities Natural gas Usage	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fuel Diesel	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fuel Bio-diesel (Canola)	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fuel Gasoline	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fuel Natural Gas	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Savings	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discount Factors		0.97	1.03	1.09	1.16	1.23	1.31	1.39	1.48	1.57	1.67	1.77	1.88	1.99	2.12	2.25	2.39	2.53	2.69	2.86	3.03	3.22	3.42	3.63	3.86	4.09	4.35	4.62
Discounted Savings	**$ K**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reliability Improvement																												
SAIFI improve	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SAIDI improve	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Outage Events Avoided	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Outage Duration Time Avoided	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Savings	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discount Factors		0.97	1.03	1.09	1.16	1.23	1.31	1.39	1.48	1.57	1.67	1.77	1.88	1.99	2.12	2.25	2.39	2.53	2.69	2.86	3.03	3.22	3.42	3.63	3.86	4.09	4.35	4.62
Discounted Savings	**$ K**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Community Contributions																												
Community Events and Sponsorships	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Economic Strength	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Education	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Environment	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Health and Safety	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Social Services	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volunteerism	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Annual Contributions	$ K	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Discount Factors		0.97	1.03	1.09	1.16	1.23	1.31	1.39	1.48	1.57	1.67	1.77	1.88	1.99	2.12	2.25	2.39	2.53	2.69	2.86	3.03	3.22	3.42	3.63	3.86	4.09	4.35	4.62
Discounted Contributions	**$ K**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dollar-Equivalent Non-Financial																												
Savings from Productivity Improvement		-																										
Savings form Carbon Reduction	**$**	-																										
Savings from Reliability Improvement	**$**	-																										
Contributions to Community	**$**	-																										
Comprehensive Net Present Value	**$**	690,000																										

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J7.6:

Reference(s):

To determine whether there was an analysis prepared to show the difference between using internal Toronto hydro employees versus contract employees and if there [is] such an analysis, to produce it.

RESPONSE:

Toronto Hydro's analytical approach to the cost comparison between construction projects completed by the utility's internal crews and those delivered by the external Design and Construction (D&C) contractors is presented in Exhibit 2B, Section C3.4.1.1. In short, the analysis involves disaggregation of a set of internally delivered "reference projects" into the activity-based units utilized by contractors, followed by a series of adjustments to account for the differences in the scope of activities and cost structures between a regulated utility such as Toronto Hydro and the D&C contractors operating in a competitive marketplace.

Further information on the utility's external contractor benchmarking process is provided in the response to Interrogatory 2B-CUPE-2, which showcases a numerical example of the methodology underlying the cost comparison, outlines the scope of the factors considered in the assessment, and clarifies the intended use of the assessment's results. As discussed in the Exhibit 2B Section C3.4.1, "given that Toronto Hydro's external contractors operate in the same environment as the utility's internal crews, and use materials paid for and procured by the utility, comparisons between the costs of externally and internally constructed projects constitute an appropriate form of

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

construction cost benchmarking."[1] As of the latest (2013) assessment, the costs of the utility's internal project construction were materially higher than the costs of the same projects had they been constructed by the external D&C contractors.

As discussed in Exhibit 2B Section C, "as the utility continues conducting these comparative exercises over the 2015-2019 planning horizon, it may undertake more detailed assessments of individual cost drivers that make up the cost gap between contractor-delivered and internally constructed projects."[2]

[1] Exhibit 2B, Section C3.4.1, page 22.
[2] Exhibit 2B, Section C3.4.3, page 25.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J7.7:

Reference(s):

To provide the effective date for Table 2, Exhibit 4A, Tab 4, Schedule 3, page 12 of 25.

RESPONSE:

The Statistics Canada data in Table 2 is based on Statistics Canada's Age Distribution of Labour Force in Canada/All Industries (2013). The Toronto Hydro data in Table 2 is current as of December 31, 2013.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J7.8:

Reference(s):

To provide a breakdown by age of Toronto Hydro employees on a per-year basis.

RESPONSE:

Age	% Per Age
22	0.06%
23	0.78%
24	0.90%
25	1.87%
26	2.07%
27	2.07%
28	1.55%
29	2.78%
30	2.65%
31	2.33%
32	2.65%
33	2.20%
34	2.00%
35	1.81%
36	1.62%
37	1.75%
38	1.68%
39	1.29%
40	1.10%
41	0.97%
42	1.36%
43	1.49%
44	1.36%
45	2.39%
46	2.78%

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

Age	% Per Age
47	2.59%
48	4.14%
49	4.07%
50	4.85%
51	5.75%
52	4.98%
53	5.56%
54	5.11%
55	3.94%
56	3.04%
57	2.39%
58	2.00%
59	2.00%
60	1.36%
61	1.29%
62	1.29%
63	0.71%
65	0.58%
66	0.39%
67	0.19%
68	0.13%
70	0.06%
71	0.06%

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J7.9:

Reference(s):

To explain the four-year 30 percent increase in average Executive compensation costs.

RESPONSE:

	2011	2012	2013	2014	2015	2011 v. 2015
Executive FTEs	9.2	7.4	8	~~6.0~~ 6.3[1]	6	-35%
Total Salary and Wages	$ 2,840,668	$ 2,554,144	$ 2,661,984	$ 2,469,509	$ 2,424,089	-15%
Average Total Salary and Wages per FTE	$308,768	$345,155	$332,748	$391,986	$404,015	31%

As demonstrated by the table above, total salary and wages for the executive workforce have decreased by 15% between 2011 and 2015. Toronto Hydro respectfully submits that average compensation per FTE is not a useful or reliable indicator to assess the reasonableness of the utility's compensation levels, and that the analysis should focus on total compensation levels (including benefits), which have decreased by 19% from 2011 to 2015 with respect to the executive workforce.

In addition, Toronto Hydro notes that the latest executive compensation benchmarking study commissioned by the Human Resources Committee of Toronto Hydro Corporation's Board of Directors in October 2012 (1B-SEC-8, Appendix N) indicates that compensation levels for Named Executive Officers at Toronto Hydro are generally at or below the market competitive levels.

[1] In preparing this response, Toronto Hydro determined that the 2014 FTE number had been rounded in Appendix A to Undertaking TC J2.4. The actual number of FTEs for 2014 was 6.3.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

Variance explanations for average total salary and wages per executive FTE:

- **2011 vs. 2012**: Although total salary and wages decreased by 10.1% from 2011 to 2012, average salary and wages per FTE increased by 11.8% over the period due to the timing of the variable performance payout[2] relative to the reduction of FTEs from 2011 to 2012. For greater clarity, the variable performance payout in 2012 was driven by the number of FTEs in 2011 (9.2), but the average compensation per FTE in 2012 was calculated based on the number of FTEs in that year (7.4).
- **2012 vs. 2013**: Although total salary and wages increased by 4.2% from 2012 to 2013, average salary and wage per FTE decreased by 3.6% over the period due to the timing of the variable performance payout relative to the reduction of FTEs from 2012 to 2013. For greater clarity, the variable performance payout in 2013 was driven by the number of FTEs in 2012 (7.4), but the average compensation per FTE in 2013 was calculated based on the number of FTEs in that year (8.0).
- **2013 vs. 2014:** Although total salary and wages decreased by 7.2% from 2013 to 2014, average compensation per FTE increased by 17.8% over the period due to base salary and variable performance pay increases for the executives that acquired expanded portfolios in 2013 to accommodate the permanent reduction of the executive workforce by approximately two FTEs. Consistent with the explanations above, the increase is also affected the timing of the variable performance payout relative to the reduction of FTEs from 2013 to 2014.
- **2014 vs. 2015:** Although Toronto Hydro forecasts total salary and wages to decrease by 1.8% from 2014 to 2015, average salary and wages per FTE are expected to increase by 3.1% over the period due to the timing of the variable performance payout relative to the reduction of FTEs from 2014 to 2015.

[2] Variable performance pay for a given year is incurred in the first quarter of the following year, after the company's annual results are finalized and approved by the Board of Directors.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. J7.10:

Reference(s):

To explain why it is reasonable for Toronto Hydro to pay Toronto Hydro Corporation a 6.16 percent coupon rate on the $45 million promissory note.

RESPONSE:

The $45 million promissory note was part of an earlier instrument – 2003 Series 1 Note – held by the parent company at the time that the note was issued. As a result, the $45 million promissory note was issued at the same rate as the original instrument.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. J7.11:

Reference(s):

To explain what sort of capital can be put in-service in the 2015-2019 period so that the AFFO-to-debt metric does not go below the 13 percent threshold, assuming no increase in OM&A and rates.

RESPONSE:

The AFFO-to-debt metric is forecasted to be 12.3% at the end of 2015. However, due to rate and calendar year synchronization in 2016, Toronto Hydro anticipates a sustained increase in the metric such that the capital expenditures (Exhibit 2A, Tab 6, Schedule 3) and related in-service additions (response to OH J4.3) in evidence for the 2016-2019 period are expected to result in an AFFO-to-debt metric above 13%.

This determination was made based on assumptions consistent with information included in Toronto Hydro's application, including:

- OM&A increases in 2016-2019 as per the proposed rate framework in Exhibit 1B, Tab 2, Schedule 3;
- Deemed ROE rates not changing over the CIR term; and
- Debt service rates over the CIR term that are based on projected market rates.

Synchronization of the rate and fiscal years in 2016 results in better alignment of cash inflows and outflows, causing a sustained improvement in the AFFO-to-debt metric which, as indicated in the rating agency report, is credit positive.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. J8.1:

Reference(s):

To explain why there would be no difference to the impact of 2015 PILs using IFRS instead of USGAAP.

RESPONSE:

The calculation of PILs for 2015 is the same under both IFRS and USGAAP accounting standards. The calculation of PILs is based on the computation of taxable income derived from accounting income. Net income for accounting purposes, whether calculated using IFRS or USGAAP, is adjusted for accounting/tax differences to arrive at taxable income.

Key differences between IFRS and USGAAP are outlined in Exhibit 1C, Tab 4, Schedule 4, pages 33 and 34. With reference to this table, the remainder of this response focusses on the differences that affect net income for accounting purposes (rather than balance sheet differences – a balance sheet reclass difference does not impact the calculation of PILs).

One key difference outlined is the derecognition of PP&E under IAS16. In arriving at taxable income using IFRS net income, the derecognition of PP&E is reversed. Taxable income would therefore be the same if calculated using USGAAP.

A second key difference is with regards to Employee Benefits under IAS19. In order to arrive at taxable income using both USGAAP and IFRS, only actual payments made are deducted. Any gains or losses recognized for accounting purposes under both standards

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

are reversed in arriving at taxable income. Using either accounting standard results in the same calculated PILs.

A third key difference is with regards to borrowing costs under IAS23. For accounting purposes under both standards, borrowing costs that are directly attributable to a capital asset are capitalized. There is a difference in the quantum that can be capitalized under both standards. In arriving at taxable income, borrowing costs capitalized are reversed and only the actual interest expense is deducted. Taxable income would therefore be the same under IFRS and USGAAP.

A fourth key difference is with regards to provisions, contingent assets and liabilities under IAS37. For accounting purposes, amounts in respect of asset retirement obligations are capitalized and then deducted either as depreciation, accretion or interest expense. In arriving at taxable income, these expenses are reversed. For tax purposes, a deduction is only made for actual expenses incurred. PILs is therefore the same under both standards.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. J8.2:

Reference(s):

To explain why the land lease was classified as pre-paid under US GAAP, and to confirm whether THESL has paid the land lease full amount upfront.

RESPONSE:

The cost related to the land lease was paid upfront in 1995 and, for accounting purposes, was appropriately recorded as a prepaid expense under Generally Accepted Accounting Principles ("GAAP"). This lease also qualified as an operating lease under GAAP.

Please see the response to Undertaking J2.16 in which the accounting treatments under US GAAP, IFRS and the APH have been described.

Under IFRS IAS 17, land leases are considered finance leases since it is deemed that significant risks and rewards of ownership of the land are transferred to the lessee – in this case, Toronto Hydro.

This accounting treatment under IFRS is consistent with the treatment under APH as directed in Article 425 – Leases on pages 6 and 8 and, as a consequence, results in its eligibility to be included in Rate Base.

ORAL HEARING UNDERTAKING RESPONSE TO ONTARIO ENERGY BOARD STAFF

UNDERTAKING NO. J8.3:

Reference(s):

To explain why the corresponding liability is not being recorded (for the entry in Technical Conference J2.16).

RESPONSE:

There is no corresponding liability for the entry in TC J2.16 as the land lease was paid upfront in 1995.

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

UNDERTAKING NO. J8.4:

Reference(s):

To comment on whether a revenue offset would be used for energy stored at off-peak rates and injected into the system at peak rates.

RESPONSE:

Toronto Hydro expects that variances in commodity rates between energy stored at off-peak and energy injected back into the system when needed would be captured within the distributor's Cost of Power account. All energy costs from Toronto Hydro's sources of supply accrue to the Cost of Power, and variances between these costs and the commodity rates paid by customers are accounted for through the normal wholesale settlement process with the IESO and the RSVA Power account.

ORAL HEARING UNDERTAKING RESPONSE TO SOCIETY OF ENERGY PROFESSIONALS

UNDERTAKING NO. J8.5:

Reference(s):

To advise whether additional debt will be issued, beyond the two issues of $245 million.

RESPONSE:

Toronto Hydro forecasts that it will issue approximately $200 million per year of new and incremental debt over the CIR period.

ORAL HEARING UNDERTAKING RESPONSE TO VULNERABLE ENERGY CONSUMERS COALITION

UNDERTAKING NO. J8.6:

Reference(s):

To provide a revised response to Tables 1 and 2 in J2.28-VECC-74, where values are shown by class for 2015 to 2019 and include impact of CDM programs implemented in 2014.

RESPONSE:

a) The revised version of the Table 1 includes the proposed "net" CDM impacts of programs implemented in 2014 and onwards.

b) The revised version of the Table 2 shows the "gross" CDM impacts by class, equivalent to Table 1 (net CDM impacts).

ORAL HEARING UNDERTAKING RESPONSE TO VULNERABLE ENERGY CONSUMERS COALITION

1 **Table 1 – Net CDM impacts:**

Customer Class	2014		2015		2016		2017		2018		2019	
	MWh	MW	MWh	MW	MWh	MW	MWh	MW	MWh	MW	MWh	MW
Residential	6,332		22,673		40,936		63,295		89,079		112,049	
CSMUR	128		463		837		1,295		1,825		2,297	
GS <50 kW	13,527		48,790		88,251		136,552		192,363		242,146	
GS 50-999 kW	30,961	54.9	111,576	189.2	201,775	352.6	312,183	528.1	439,730	694.9	553,481	835.8
GS 1000-4999 kW	8,494	14.9	30,543	51.2	55,203	95.4	85,390	142.8	120,242	187.9	151,312	226.0
Large Use	6,003	14.3	21,034	49.4	37,762	92.0	58,257	137.8	81,747	181.3	102,589	218.1
Total	65,445	84.1	235,078	289.7	424,764	540.0	656,973	808.7	924,987	1,064.1	1,163,874	1,279.8

2 **Table 2 – Gross CDM Impacts:**

Customer Class	2014		2015		2016		2017		2018		2019	
	MWh	MW	MWh	MW	MWh	MW	MWh	MW	MWh	MW	MWh	MW
Residential	8,888		31,522		57,035		87,620		120,475		149,649	
CSMUR	181		645		1,168		1,795		2,470		3,070	
GS <50 kW	19,063		67,952		123,113		189,229		260,352		323,567	
GS 50-999 kW	43,611	78.4	155,365	265.2	281,442	481.2	432,560	724.2	595,096	980.0	739,545	1,204.3
GS 1000-4999 kW	11,950	21.2	42,507	71.7	76,969	130.1	118,278	195.9	162,690	265.0	202,147	325.7
Large Use	8,329	20.5	29,083	69.2	52,407	125.6	80,386	189.0	110,307	255.7	136,793	314.2
Total	92,021	120.1	327,073	406.2	592,135	736.9	909,868	1,109.1	1,251,389	1,500.7	1,554,770	1,844.2

ORAL HEARING UNDERTAKING RESPONSE TO VULNERABLE ENERGY CONSUMERS COALITION

UNDERTAKING NO. J8.7:

Reference(s):

To quantify the resulting revenue-to-cost ratio and total bill impact for the street lighting class of applying the same methodology as was applied to other classes.

RESPONSE:

Below are revised tables to include the overall revenue deficiency from the Streetlight rate class, and the allocation of the amounts from the CSMUR and Streetlighting classes.

	Revenue Shortfall from COS Model	% of Total Shortfall
RESIDENTIAL	-$19,250,934	58%
GS < 50 kW	-9,870,438	30%
LARGE USER	-1,590,628	5%
SMALL SCATTER LOAD	-579,223	2%
STREETLIGHT	-2,080,556	6%
Total	**-33,371,778**	**100%**

The revenue recovery amounts are different from the $4.1 million shown in the response to VECC-55 reflecting updates to the filing that have occurred since.

ORAL HEARING UNDERTAKING RESPONSE TO VULNERABLE ENERGY CONSUMERS COALITION

	Rev Recovery
RESIDENTIAL	$2,611,079
GS < 50 kW	$1,338,766
LARGE USER	$215,743
SMALL SCATTER LOAD	$78,562
STREETLIGHT	$282,194
	$4,526,344

The resulting revenue-to-cost ratio and bill impact for the Streetlighting class are shown below.

	As Proposed	Undertaking Response
Revenue-to-cost ratio	82.1	83.2
Total Bill Impact ($)	-$0.56	-$0.42
Total Bill Impact (%)	-4.1%	-3.1%

ORAL HEARING UNDERTAKING RESPONSE TO VULNERABLE ENERGY CONSUMERS COALITION

UNDERTAKING NO. J8.8:

Reference(s):

To cite any OEB Decisions supporting the understanding that revenue-to-cost ratios within updated Board guidelines are within an acceptable range.

RESPONSE:

Section 2.1 of the Board's EB-2007-0667 Report is as follows (emphasis added):

> This section sets out an overview of the Board's policy as it relates to revenue-to-cost ratios.
>
> **The Board has concluded that an incremental approach is appropriate in light of the influencing factors identified below, and that a range approach is preferable to implementation of a specific revenue-to-cost ratio**. **Influencing factors aside, a revenue-to-cost ratio of one may not be achievable or desirable for other reasons (for example, to accommodate different rate design objectives).** In addition, as a practical matter there may be little difference between a revenue-to-cost ratio of near one and the theoretical ideal of one.
>
> The Board has therefore adopted, with some modification, the proposal set out in the Discussion Paper of creating bands or ranges of tolerance around revenue-to-cost ratios of one. As the influencing factors are addressed over time, the Board expects that these bands will narrow and move closer to one.

ORAL HEARING UNDERTAKING RESPONSE TO VULNERABLE ENERGY CONSUMERS COALITION

> The ranges established by the Board are set out in section 3, and are intended to be minimum requirements. To the extent that distributors can address influencing factors that are within their control (such as data quality), they should attempt to do so and to move revenue-to-cost ratios nearer to one. As indicated in the Report other issues such as addressing the fact that the Uniform System of Accounts is less detailed than required to accommodate the methodology and certain rate design matters are beyond the control of individual distributors. **These exogenous issues also need to be addressed before moving to an appropriate specific revenue-to-cost ratio.**

Section 3.4.4.1 of the Board's EB-2012-0383 Report is as follows (emphasis added):

> The Board will not change the CA Model; however, given the possible misuse of or misunderstanding of the CA Model, the Board will augment the instructions or worksheets contained in the CA Model to deal with some of the issues raised in the course of this consultation.
>
> **The Board remains concerned with the allocation of costs to daisy-chain configured systems. The disparity in the cost allocation result between a street lighting customer configuration with multiple devices per connection and a street lighting customer with a device to connection ratio close to 1:1 appears to be disproportionate when compared to actual costs to serve the street lighting rate class. The Board believes that further investigation is necessary before making a determination.**

ORAL HEARING UNDERTAKING RESPONSE TO VULNERABLE ENERGY CONSUMERS COALITION

The Board will issue a letter shortly to begin a consultation process for this single issue.

Toronto Hydro has also located the following OEB Decisions (relevant pages attached) which support the utility's proposal to maintain the revenue to cost ratios within the guideline ranges set by the OEB:

1. **EB-2011-0319 – Espanola Regional Hydro Distribution Corporation (see Appendix A).** The OEB accepted the proposed revenue-to-cost ratios, which were in the guideline ranges, even though the ratios for the GS<50kW and USL classes moved further from unity compared with the ratios determined by the Cost Allocation Model.
2. **EB-2013-0160 – Orangeville Hydro Limited (see Appendix B).** The OEB accepted a Settlement Proposal with the revenue-to-cost ratios, which were in the guideline ranges, even though the ratios for GS less than 50kW, Sentinel Lights, Street Lighting and USL classes moved further from unity compared with the ratios determined by the Cost Allocation Model.
3. **EB-2013-0159 – Oakville Hydro Electricity Distribution (see Appendix C).** The OEB accepted a Settlement Proposal with the revenue-to-cost ratios, which were in the guideline ranges, even though the ratios for GS 50 to 999kW class moved further from unity compared with the ratios determined by the Cost Allocation Model.
4. **EB-2012-0146/EB-2012-0380 – London Hydro Inc. (see Appendix D).** The OEB accepted a Settlement Proposal with the revenue-to-cost ratios, which were in the guideline ranges, even though the ratios for Residential class moved further from unity compared with the ratios determined by the Cost Allocation Model.

ORAL HEARING UNDERTAKING RESPONSE TO VULNERABLE ENERGY CONSUMERS COALITION

Toronto Hydro's proposal for revenue-to-cost ratios for all classes maintains the model derived revenue-to-cost ratio or moves it closer to unity, with the exception of the Street Lighting class. The ratio of the Street Lighting class is reduced from the model-derived value and moves further from unity solely due to maintaining the current 2014 rates for this class, to mitigate for the potential impact of the investigation noted in the Board's EB-2012-0383 Report noted above. Toronto Hydro notes that the proposed Street Lighting ratio is above the ratio last approved, and closer to unity.

Toronto Hydro-Electric System Limited
EB-2014-0116, Oral Hearing
Schedule J8.8, Appendix A
Filed: 2015 Mar 2 (1 page)

Revenue-to-Cost Ratios

Customer Class	Updated Current Ratios	Proposed Ratios for Test Year	Board's Target Range - Floor	Board's Target Range - Ceiling
Residential	93.4%	95.2%	85%	115%
GS < 50 kW	113.9%	115.9%	80%	120%
GS > 50 kW	135.7%	120.0%	80%	120%
Street Lighting	68.7%	70.0%	70%	120%
Sentinel Lighting	68.3%	80.0%	80%	120%
Unmetered Scattered Load	114.3%	114.9%	80%	120%

Before any adjustments, the GS > 50 kW class exceeded the ceiling of the Board's target ranges and the Street Lighting and Sentinel Lighting classes fell below the floor of the Board's target ranges. ERHDC proposed to move the Street Lighting and Sentinel Lighting classes to the floor of the respective target ranges and move the GS > 50 kW class to the ceiling of the target range on one year.

VECC submitted that this approach is appropriate and consistent with what had been approved by the Board for other distributors. Given that all the classes are within the Board's target ranges, Board staff had no concerns with the revenue-to-cost ratio proposal.

BOARD FINDINGS

The Board finds that the proposed revenue-to-cost ratios are reasonable and consistent with the Board's revenue-to-cost ratio policy.

Monthly Service Charges ("MSC")

ERHDC is proposing to maintain the same fixed/variable proportions for all the customer classes. The proposed MSC are all within the Board's policy ranges, except for the GS > 50 kW class. ERHDC's current and proposed MSCs are presented in the following table:

Evidence: Ex 3, Tab 1, Sch 2; Ex 3, Tab 2, Sch 2, 3, 4, 5; Load Forecast Model; 8.1-Energy Probe-39; 8.1-VECC-30; 8.1-Staff-35; 8.1-Staff-36; 8.1-Staff-37; 8.1-Energy Probe-40; 8.1-Energy Probe-41; 8.1-Energy Probe-42; 8.1-Energy Probe-43; 8.1-Energy Probe-44; 8.1-Energy Probe-45; 8.1-VECC-29 & OHL Clarification on IR Responses; 8.1-VECC-30; 8.1-VECC-31; 8.1-VECC-32; 8.1-VECC-33; 8.1-VECC-34; 8.1-VECC-35; 8.1-VECC-36; and Responses to VECC Clarification Questions 2, 3, 4 and 5.

Supporting parties: Orangeville Hydro, EP, SEC and VECC.

8.2 Is the proposed cost allocation methodology including the revenue-to-cost ratios appropriate?

Complete Settlement: For the purposes of settlement of the issues in this proceeding, the Parties agree that the cost allocation methodology is appropriate and results in revenue-to-cost ratios that are within the Board's permitted ranges. Orangeville Hydro is not proposing any adjustments to the revenue-to-cost ratios resulting from the cost allocation methodology, and the Parties agree that this is consistent with Board policy.

Table 9: Changes to Revenue to Cost Ratios

Rate Classification	Test Year Service Revenue Requirement	Revenue Offset	Test Year Base Revenue Requirement	OHL Proposed 2014 Revenue to Cost Ratios Original	OHL Proposed 2014 Revenue to Cost Ratios Settlement	Difference	Board Target Low	Board Target High
Residential	3,388,798	313,142	3,075,657	103.0%	101.7%	-1.35%	85%	115%
GS < 50 kW	844,056	59,773	784,283	110.8%	116.0%	5.16%	80%	120%
GS >50 to 4999 kW	867,604	78,871	788,733	84.2%	84.9%	0.69%	80%	120%
Sentinel Lights	11,534	1,585	9,948	80.3%	80.0%	-0.27%	80%	120%
Street Lighting	101,243	11,463	89,780	87.3%	86.6%	-0.71%	70%	120%
Unmetered and Scattered Load	11,668	1,254	10,414	109.4%	116.8%	7.47%	80%	120%
Total	**5,224,903**	**466,089**	**4,758,814**					

Evidence: Ex 7, Tab 1, Sch 1, 2, 3; Cost Allocation Model, Appendix 2-P; 2-W; Ex 3, Tab 2, Sch 1; 8.2-Staff-38; 8.2-Staff-39 & OHL Clarification on IR Responses; 8.2-Energy Probe-47; 8.2-Energy Probe-48; 8.2-VECC-37; 8.2-VECC-38; and 8.2-VECC-39.

Supporting parties: Orangeville Hydro, EP, SEC and VECC.

8.3 Is the proposed rate design including the class-specific fixed and variable splits and any applicant-specific rate classes appropriate?

Complete Settlement: For the purposes of settlement of the issues in this proceeding, Orangeville Hydro agrees to reduce the proposed GS>50 fixed charge to $160, to move it closer to the ceiling in the Board's cost allocation model, and to adjust the variable charge accordingly. For the purposes of settlement of the issues in this proceeding, and subject to the adjustment noted herein, the Parties agree that the proposed rate design including class-specific fixed and variable splits and any applicant-specific rate classes are appropriate.

Revenue-to-Cost Ratios

- In its Application, Oakville Hydro had proposed to adjust the revenue to cost ratios for any rate class that was above the upper boundary of the Board's Policy range to the upper boundary and to adjust the revenue to cost ratios of the remaining class proportionately.

  In response to Board staff interrogatory number 8.2-Staff-44, Oakville Hydro corrected Board Appendix 2-P and proposed that it change the revenue-to-cost ratio for the Embedded Distributor rate class to 100% and change the revenue-to-cost ratio for all classes below 100% to 97.54% to provide a more equitable balance of revenue-to-cost ratios.

  The Parties have agreed to the approach proposed in response to Board staff interrogatory number 8.2-Staff-44 with the exception that the Residential rate class would not change from the original proposal of 98.53%. The agreed to revenue-to-cost ratios are summarized in the Settlement Table 24.

Settlement Table 24 - Proposed Revenue-to-Cost Ratios

	8.2-Staff-44		Settlement
Rate Class	Corrected	Proposed	Agreement
Residential	98.53%	97.54%	98.53%
General Service<50 kW	120.00%	120.00%	120.00%
General Service>50 kW	96.99%	97.54%	95.86%
General Service>1,000 kW	94.72%	97.54%	95.86%
Street Lighting	95.01%	97.54%	95.86%
Sentinel Lighting	120.00%	120.00%	120.00%
Unmetered	120.00%	120.00%	120.00%
Embedded Distributor	120.00%	120.00%	100.00%

8.3 Is the proposed rate design including the class-specific fixed and variable splits and any Applicant-specific rate class appropriate?

7. COST ALLOCATION

7.1 Is London Hydro's cost allocation appropriate?

Status: **Complete Settlement**

Supporting Parties: London Hydro, Energy Probe, LPMA, SEC, VECC

Evidence: Application: Exhibit 7
OEB IR # 40
LPMA IR # 41
VECC IR # 39

The Parties have agreed for the purposes of settlement that the revenue-to-cost ratios for the 2013 Test Year, reflecting the agreed-upon 2013 Test Year Revenue Requirement, will be as set out in Settlement Table #12: 2013 Test Year Revenue to Cost Ratios, below.

Settlement Table #12a: 2013 Test Year Revenue to Cost Ratios

Customer Class	Revenue Requirement 2013 Cost Allocation Model - Line 40 from O1 of CA.	CA Adjusted 2013 Test Year NET Distribution Revenue at Existing 2012 Rates	Revenue Allocated from 2013 Cost Alocation Model Line 19 from O1 in CA	Total Revenue	Revenue Cost Ratio	Proposed Revenue to Cost Ratio
Residential	$ 37,252,650	$ 38,071,995	$ 2,239,705	$ 40,311,700	108.21%	108.28%
GS <50 kW	9,516,761	8,305,148	504,264	8,809,412	92.57%	92.57%
GS 50 to 4,999 kW	15,604,675	12,708,730	748,115	13,456,845	86.24%	86.24%
GS 1,000 to 4,999 kW (Co-Generation)	229,772	268,447	6,622	275,069	119.71%	119.71%
Large Use >5MW	1,343,950	1,698,767	41,781	1,740,548	129.51%	115.00%
Street Light	1,576,108	1,100,695	80,793	1,181,488	74.96%	80.00%
Sentinel	65,751	48,707	3,379	52,086	79.22%	80.00%
Unmetered Scattered Load	156,180	87,516	7,973	95,489	61.14%	80.00%
Standby Power	580,185	385,460	17,935	403,395	69.53%	80.00%
TOTAL	**$ 66,326,032**	**$ 62,675,465**	**$ 3,650,567**	**$ 66,326,032**		

Settlement Table #12b: 2013 Test Year Revenue to Cost Ratios

Customer Class	2013 Proposed Service Revenue Requirement	2013 Proposed Miscellaneous Revenue per Cost Allocation Model	2013 Proposed Base Revenue Requirement	Proposed Revenue to Cost Ratio	Policy Range
Residential	$ 40,858,761	$ 2,239,705	$ 38,619,056	108.28%	85 - 115
GS <50 kW	8,922,967	504,264	8,418,703	92.57%	80 - 120
GS 50 to 4,999 kW	12,900,821	748,115	12,152,706	86.24%	80 - 120
GS 1,000 to 4,999 kW (Co-Generation)	250,692	6,622	244,070	119.71%	80 - 120
Large Use >5MW	1,555,669	41,781	1,513,888	115.00%	85 - 115
Street Light	1,281,325	80,793	1,200,532	80.00%	70 - 120
Sentinel	53,301	3,379	49,922	80.00%	80 - 120
Unmetered Scattered Load	128,119	7,973	120,146	80.00%	80 - 120
Standby Power	374,377	17,935	356,442	80.00%	80 -120
TOTAL	**$ 66,326,032**	**$ 3,650,567**	**$ 62,675,465**		

The Parties agreed to conform to the requirements as specified in the interrogatory LPMA Question # 39 b). The interrogatory proposed that the GS 50 to 4,999 kW (Co-Generation) class be decreased in order to achieve a revenue-to-cost ratio of 120%. Further, the revenue-to-cost ratio for the Large User class would be at 115%, the USL class at 80%, and Standby Power class at 80%. The interrogatory also proposed that the Applicant "…increase the classes with the lowest revenue to cost ratio until it reaches the next lowest class and them increase these ratios until the next lowest class and so on, until the revenue shortfall is eliminated."

The shortfalls as to revenue-to-cost ratios were realized with the Streetlight class and the Sentinel class, by raising the proposed revenue-to-cost ratio of each to 80%. A small remaining balance was applied to the Residential class to clear the variance.

7.2 Are the proposed revenue-to-cost ratios for each class appropriate?

Status:	**Complete Settlement**
Supporting Parties:	London Hydro, Energy Probe, LPMA, SEC, VECC
Evidence:	Application: Exhibit 7 VECC IR # 40 SEC IR # 39/ 40

For the purposes of settlement, the Parties have accepted the revenue-to-cost ratios for the 2013 Test Year, as set out under issue 6.1, above, and that no further adjustments will be required from 2014-2016 as part of this Agreement. The Parties acknowledge that London Hydro's revenue-to- cost ratios remain subject to further Board policy changes of general application over this period.

ORAL HEARING UNDERTAKING RESPONSE TO CONSUMERS COUNCIL OF CANADA

UNDERTAKING NO. J8.9:

Reference(s):

To provide the 2015-2019 projections for SAIDI and SAIFI without MEDs and Loss of Supply, or to explain why they cannot be provided.

RESPONSE:

Please refer to interrogatory response 2A-EP-8, part c.

ORAL HEARING UNDERTAKING RESPONSE TO CONSUMERS COUNCIL OF CANADA

UNDERTAKING NO. J8.10:

Reference(s):

To explain why productivity fleet and productivity facilities are not included in the 2015 KPIs.

RESPONSE:

The Fleet and Facilities Key Performance Indicators were removed from the utility's corporate scorecard in 2015 due to the substantial completion in 2014 of the major activities that drove the inclusion of these metrics onto the Scorecard. The completed activities included vacation of the 28 Underwriters and 5800 Yonge facilities and targeted reduction of Toronto Hydro's fleet count. There are no major activities associated with either fleet size or facilities footprint reduction planned for 2015.

ORAL HEARING UNDERTAKING RESPONSE TO VULNERABLE ENERGY CONSUMERS COALITION

UNDERTAKING NO. J8.11:

Reference(s):

To provide an update of forecast Regulatory Costs in the same format as shown in CCC 38.

RESPONSE:

Below is an updated forecast of the CIR Application costs, presented in the same format as shown in 4A-CCC-38(b), except that the 2014 costs reflect actuals.

CIR Application	Historical Year(s)	2014 Actuals	2015 Test Year
Legal costs	$51,226	$677,944.61	$1,075,032
Consulting costs	$373,030	$1,778,564.45	$980,782
Intervenor costs	n/a	n/a	$1,000,000
Total Costs	**$424,256**	**$2,456,509**	**$3,055,814**

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J9.1:

Reference(s):

To advise whether or not Toronto Hydro used municipal accounting in any period prior to the benchmark.

RESPONSE:

Based on available records, Toronto Hydro can confirm that Generally Accepted Accounting Principles ("GAAP") accounting was used from 1998 onward. Toronto Hydro's best available information indicates that GAAP was also in use in the period from 1988 to 1998.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J9.2:

Reference(s):

To review the Figures in SEC's cross-examination compendium.

RESPONSE (Prepared by PSE):

PSE was asked to comment on conclusions made by Dr. Kaufmann in undertaking responses J3.6 and J3.7, with respect to the discrepancies in capital cost inflation rates underlying the PSE and PEG models. The request for PSE commentary originated in the course of Mr. Shepherd's cross-examination of Ms. Klein, where Mr. Shepherd referred to PSE's capital inflation price assumptions as "errors" discovered and corrected by Dr. Kaufmann. PSE disagrees with Dr. Kaufmann's conclusions and Mr. Shepherd's comments in relation to PSE's earlier evidence. PSE provides the following response.

Having reviewed PEG's responses to J3.6 and J3.7, PSE understands that the discrepancy between the PEG and PSE models on capital price inflation is a product of a late model adjustment performed by PEG in the course of completing the Oral Hearing undertaking responses. Prior to the submission of Dr. Kaufmann's undertakings, both the PSE and PEG models utilized identical capital input price assumptions originally developed by PSE. At no point prior to submission of undertaking responses J3.6 and J3.7 did PEG voice any concerns regarding PSE's capital inflation assumptions or ask any questions to investigate the matter further.[1]

[1] At the request of PEG and Board Staff, PSE provided its models, data, and computer code to PEG shortly after the PSE report was filed in July 2014. This was done in order to move the proceeding further by allowing PEG the maximum amount of time to thoroughly review all of PSE's materials which included the underlying assumptions. PEG filed its report in December.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

PEG bases its new capital asset inflation assumption on the 2003-2013 average annual growth rate of the Canadian Electric Utility Construction Price Index (EUCPI), which amounts to a rate of 2.0% over the 10-year period. PSE, on the other hand, based its capital asset inflation assumption on the long-term (40-year) average annual growth rate of the EUCPI and the Constant Interest Rate Assumption, which produced a result of about 4.5%.

PSE has a number of methodological concerns with PEG's new capital price assumption. In PSE's opinion, there are three main reasons why PEG's 2003-2013 growth rate assumption is inappropriate and should be rejected in favor of PSE's original assumption, which was used by PEG throughout the proceeding until it filed undertakings J3.6 and J3.7 at Mr. Shepherd's request. These reasons are:

1. The Electric Utilities Construction Price Index (EUCPI) utilized by PEG includes financing costs, which can distort construction prices if they are not properly controlled for. The 2003-2013 timeframe used by PEG as the basis for its 2015-2019 capital price inflation rate featured rapidly declining interest rates, which materially understate PEG's inflation assumptions.
2. If PEG chose to use the most recent 10-year period as the basis for its forward-looking inflation assumption, the appropriate means of doing so would be by using the Handy-Whitman Index of Public Utility Construction Costs – an authoritative U.S. source on utility construction prices, which isolates the effect of financing costs on utility construction prices. Using the Handy-Whitman Index for electric distribution construction prices, PEG's future capital construction assumption would be set at 6.1%/year – significantly higher than PSE's current assumptions.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

3. PSE's engineering experience in producing cost estimates and construction work plans suggests that over the next five years the capital asset inflation can be expected to fluctuate around 4-5%. This assessment is based on recent project construction close-out costs, shortages of specialized labor, and levels of demand for transmission and distribution materials driven by emerging economics and aging North American infrastructure.

The remainder of this response discusses each of the three above-noted considerations in more detail.

1. Issues with using 2003-2013 Growth rate in the EUCPI index.

The EUCPI includes financing costs which will drive down the growth rate during periods of declining interest rates embedded within the index. Statistics Canada states that one of the data sources for the index is financing costs which are gathered from the Bank of Canada.[2]

The relationship between the EUCPI and interest rates can be shown by including the interest rate changes into a table with the EUCPI changes. In PEG's response to J3.6, Dr. Kaufmann showed the historical growth rates of the EUCPI from 1973-1983, 1983-1993, 1993-2003, and 2003-2013. The implication appears to be that PSE included the 1970s time period because of the rapid increase in the EUCPI so as to artificially drive up the EUCPI growth rate. That implication would be incorrect. Instead, PSE included the 1970s time period because 40 years is sufficiently long to include periods of rapid interest rate increases and periods of rapidly declining

[2] http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=2316#a

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

interest rates. Additionally, we used the 40-year period because this was the assumption used by PEG in 4th Generation IR regarding the useful life of assets.

Below is a table of EUCPI growth rates produced by PEG in J3.6 but now augmented with the interest rate growth rates inserted for those same time periods and the 40-year growth rates also calculated.[3]

	EUCPI Annual Average Growth Rate (includes financing costs)	Interest Rate Annual Average Growth Rate (10-year U.S. Treasury)	
1973-1983	9.6%	4.8%	Increasing interest rate period
1983-1993	3.2%	-6.4%	Declining Interest rate period
1993-2003	2.4%	-3.8%	Declining Interest rate period
2003-2013	2.0%	-5.3%	Declining Interest rate period
1973-2013	4.3%	-2.7%	Declining Interest rate period

Using PEG's suggestion of considering only the 2003-2013 EUCPI growth rate of 2.0% would artificially reduce growth due to the substantial decline in the interest rates during that period. Embedding this decline into the projected data is tantamount to assuming interest rates will continue to decline by 5.3% per year over the next five years, which is unrealistic.

2. The Handy-Whitman Index

Both PSE's and PEG's research use the U.S. Handy-Whitman construction cost indexes for electric distribution assets. These indexes are not influenced by financing costs. Electric utility capital asset inflation, measured by the Handy-Whitman

[3] PSE's 4.55% assumption does not match the 1973-2013 number exactly because we actually used the 1972-2012 time period as that was the most recent information available at the time of the original research. We use these time periods to align with what PEG showed in response J3.6.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

indexes, has far outpaced general economy-wide inflation trends for the last ten years.[4] Assets used for electric distribution are quite different from goods generally used throughout the economy. This divergence in the electric distribution asset inflation rate corresponds to the growth in emerging global economies, efforts to address aging infrastructure resulting from the build out of capital infrastructure in the post-World War II era that now requires replacement, and the lack of an adequate supply of specialized labor within the industry.

In the table below we examine how capital asset inflation has increased over the 2003-2013 time period cited by PEG as the most appropriate time period to use. The table shows the six different regions of the U.S. produced by the Handy-Whitman publication.

	2003-2013 Handy Whitman Indexes for Total Distribution Electric Plant Average Annual Growth Rate (does not include financing costs)
North Atlantic	6.3%
South Atlantic	6.3%
North Central	5.8%
South Central	6.2%
Plateau	6.2%
Pacific	5.9%
U.S. Average	6.1%

[4] Please see a newsletter article, entitled "Uncharted Waters," authored by Mr. Sonju regarding the divergence of general economy-wide inflation and recent capital asset inflation, which can be located at http://www.powersystem.org/media/articles/pse-spring13-web.pdf

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

If the 2003-2013 time period is seen by PEG as the most appropriate and a constant interest rate assumption is used, PEG should have inserted one of the numbers in the table above into its model, rather than the 2.0% EUCPI growth rate influenced by the pronounced decline in interest rates during the 2003-2013 time period. If PEG had instead inserted the North Atlantic Handy-Whitman growth rate of 6.3%, for example, PSE estimates that PEG's findings would show THESL in the 0.3% stretch factor range during the historical time period (recall its finding is +8.0% during that time period) and only move THESL to Group 4 during the Custom IR period with a stretch factor of 0.45%, rather than 0.6%.

3. PSE Experience with Electrical Construction Projects

PSE conducts a large number of engineering studies for electric utilities. Our engineers and clients have noticed the increase in capital asset prices throughout the past decade. We are also aware of industry discussions about the shortage of specialized labour, expected to persist at least for the next five years. The aging infrastructure within the North American industry and the demand from the emerging global economies have also contributed to the capital asset inflation levels.

In recent years, PSE's engineering professionals have typically used a capital asset price inflation assumption between 4% and 5% in their engineering and design work. This rate assumes some slow-down in inflation from the last ten years (which was approximately 6%), as measured by the Handy-Whitman indexes, and we judge it to be the most realistic expectation for capital asset inflation within the U.S. electric distribution industry.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

The long-term EUCPI growth rate of 4.5% seems reasonable to PSE's engineering expert, Mr. Sonju, but PEG's assumed growth rate of 2.0% does not. This opinion is based on:

- The review of recent trends in project close out costs,
- Review of the recent history if the Handy-Whitman indexes for electric distribution,
- The demand for electric transmission and distribution materials driven by the emergence of global economies,
- Aging infrastructure, which will likely cause increased capital spending across North America (thus driving up demand for capital assets), and
- The lack of supply of specialized labour within the industry.

In summary, PEG's newly introduced capital asset inflation assumption of 2.0% should be rejected along with its new model results found in J3.7. The original assumption, used by both PSE and PEG throughout this proceeding, should continue to be used.

Given the recent discussions regarding appropriateness of certain variables, their definitions and other model assumptions, it may be helpful to summarize where the benchmarking results are in light of PEG's acceptance of bad debt expenses and the continued use of the original assumption on capital asset inflation, as substantiated by PSE above. In the table below we summarize the results, now noting there are only two main disagreements between PEG and PSE, assuming the original capital asset inflation assumption remains. The remaining disagreements are:

1. PEG's removal of all of the customer service and information expenses from the U.S. data in its model. PEG defends this treatment by stating that CDM expenses

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

for THESL are not included in distribution rates. There is precedent in the 4th Generation IR benchmarking work to include expenses not included in distribution rates (e.g., CIAC) to accomplish cost comparability. PSE corrected the cost comparability issue by re-including the U.S. customer service and information expenses and adding in THESL's CDM expenses.

- From Dr. Kaufmann's testimony, the two cost comparability issues amounted to about an 11% difference in results between PEG and PSE. With the bad debt issue (which had an impact of about 2%) now resolved the remaining difference due to the CSI/CDM disagreement is roughly 9%.

2. In PEG's model the urban core variable is excluded, and the high voltage variable is included. Whereas in PSE's model the urban core variable is logically-signed and statistically significant at the 99% level, PEG's high voltage variable is incorrectly-signed and statistically insignificant.
    - Based on Dr. Kaufmann's testimony, the model differences amount to roughly 15% of the 24% difference in results between PEG and PSE.

Putting aside PEG's new capital asset inflation assumption for the reasons articulated above, the table below summarizes the results and the two remaining main disagreements.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

Summary of Benchmarking Results				
	2010-2012	2015	2019	Stretch Factor Implication
PEG Result (after the bad debt correction, found in response J3.5)	8.0%	27.0%	31.7%	Historical period = 0.3%, Custom IR period = 0.6%
Approximate PEG Result (After making the CSI/CDM Adjustment suggested by PSE)	-1%	18%	23%	Historical period = 0.3%, Custom IR period = 0.45%
PSE Reply Result (After CSI/CDM adjustment and substituting urban core for high voltage variable)	-15.2%	4.1%	7.0%	Historical period = 0.15%, Custom IR period = 0.3%

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J9.3:

Reference(s):

To confirm whether there is any model showing what happens to Rates if capital spending is less than what is proposed.

RESPONSE:

This undertaking relates to an exchange between Mr. Shepherd and Ms. Klein regarding Toronto Hydro's position, articulated in various places in evidence, that deferring system renewal spending would be more costly for ratepayers in the long-term.[1]

Ms. Klein confirmed that Toronto Hydro has not modeled long-term rate impacts.[2] However, Mr. Shepherd then asked a more general question about the utility's evidentiary basis for the statement that rates would be higher if the capital spend was reduced.[3]

In response to this broader question, the following paragraphs summarize the evidentiary basis for the position that deferring system renewal investments will result in higher costs (i.e., lower value-for-money) for ratepayers over the long-term. The response also discusses how the costs and benefits of deferral are quantified in the DSP business cases.

Toronto Hydro's approach to asset renewal avoids the extra costs incurred when an asset is replaced reactively as opposed to a planned replacement.[4] Mr. Walker described these

[1] Exhibit 2B, Section E2
[2] EB-2014-0116, Transcript Volume 9 (March 3, 2015), page 79, lines 22-23.
[3] EB-2014-0116, Transcript Volume 9 (March 3, 2015), page 82, lines 14-17.
[4] Exhibit 2B, Section E2.1.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

extra costs during the Oral Hearing by providing an example of an underground cable failure that Toronto Hydro had to address reactively.[5] In this scenario, the following reactive activities would generally occur:

- Emergency response to isolate the failure and restore as much power as possible
- Reactive response to locate the fault, isolate it and further restore power
- Civil crews to excavate around the failed portion of the cable
- Repair crews to splice out the failed portion of the cable
- Civil crews to back-fill the excavation
- Switching crew to re-energize the repaired portion of cable and return service to normal

This example confirms Toronto Hydro's view that operating assets beyond their expected useful lives and replacing them reactively when they fail will increase the cost of operating the distribution system.[7] Of course, each time a cable fails, the customers also bear the costs and impacts of the power interruption until repairs are completed.

The majority of the assets targeted for replacement under the System Renewal category in the 2015-2019 period are currently operating beyond their expected Useful Life, as well as their Economic End-of-Life.[8] Replacing these assets proactively rather than waiting for them to fail reduces reactive replacement costs and the associated customer outages. Consequently, addressing Toronto Hydro's large and growing backlog of end-of-life assets in a planned and proactive manner will reduce the overall cost of operating the distribution system in the long-term relative to a reactive approach.

[5] EB-2014-0116, Transcript Volume 6 (February 25, 2015), pages 67-68
[7] Toronto Hydro accounts for the extra costs in the risk cost curves that are used to determine the optimal intervention times (i.e., the Economic End-of-Life) for individual assets.
[8] Undertaking Response TCJ1.7.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

Business Case Evaluations

The Avoided Risk Cost approach which underlies the Business Case Evaluation (BCE)[9] of the System Renewal and System Service programs[10] supports Toronto Hydro's value-for-money proposition. It does so empirically by establishing risk cost curves for individual assets based on population-based failure rates (and asset health indices where available) and by assessing the present value of the investments' costs and benefits.

By way of illustration, the Underground Circuit Renewal program (E6.1), which addresses Mr. Walker's cable fault example above, includes BCE results (Table 7) that show an Avoided Risk Cost for the first year of the program of $102.93 million. The positive result means that the Net Cost[11] of doing the work is lowest in 2015, making it the optimal year to execute the projects in terms of mitigating the extra costs that would otherwise be associated with reactive replacement and customer outages.

The consistently positive BCE results in the DSP demonstrate that deferring the planned investments that form the proposed capital expenditure plan will likely result in greater costs for Toronto Hydro customers over the long-term. While Toronto Hydro believes it is ideal to clear the backlog of end-of-life assets – and thus maximize value-for-money – as fast as possible, the utility has proposed a "paced" approach that balances these system renewal objectives with considerations for bill impacts and execution constraints.

[9] Exhibit 2B, D3.3
[10] With the exception of those investment that target system capacity issues.
[11] The Net Cost includes as costs both the sacrificed value of replacing any assets before they reach their expected useful lives, and the risk costs, which include reactive costs and customer outage costs, associated with allowing any assets to operate beyond useful life. The Net Cost also includes, as benefits, the operational savings realized by replacing the assets identified for replacement in an area as a group. A negative Avoided Risk Cost indicates that a project should be deferred or modified, while a positive Avoided Risk Cost indicates that proceeding with the project as planned will maximize value-for-money.

ORAL HEARING UNDERTAKING RESPONSE TO SCHOOL ENERGY COALITION

UNDERTAKING NO. J9.4:

Reference(s):

To provide the date when the Board of Directors approved the filing.

RESPONSE:

While Toronto Hydro's management discussed this application with the Toronto Hydro Board of Directors, the filing of the application was approved by management, not by the Board of Directors. Specifically, the requirements of the RRFE, the decision to file a custom IR application, the capital plan and anticipated rate impacts were all discussed with the Board of Directors prior to July 31, 2014 when the application was filed. The Board of Directors has approved the business plan that uses the same forecasts and assumptions as the application.

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

UNDERTAKING NO. J9.5:

Reference(s):

To update Exhibit K3.3 and to identify any issues found.

RESPONSE:

Toronto Hydro's updates to Exhibit K3.3 are embedded in Appendix to this undertaking response. Red text indicates cells that have been updated by Toronto Hydro in relation this undertaking and blue text indicates cells that have changed as a result of the formulas Energy Probe has coded into its spreadsheets.

For Tab 1, "J1.2 EP-49 02032015", Toronto Hydro undertook to estimate the adjustments to Operating Revenues (Row 4) and Total Revenue (Row 6) that are necessary to make those values for 2012 to 2014 roughly comparable to the values for 2015 to 2019. Those changes are carried through to Rows 19 and 21 as well.

In Tab 2, "CIR Formula Comparisons", Toronto Hydro undertook to identify any discrepancies between Dr. Kaufmann's proposal at page 57 of the Pacific Economics Group (PEG) report and Energy Probe's replication of Dr. Kaufmann's proposal, aside from the proposal to spread Toronto Hydro's proposed capital expenditure plan over eight years as opposed to five years.

The discrepancy Toronto Hydro has identified is due to Energy Probe's implementation of PEG's proposal to extend the stretch factor to capital costs. The corrected formula and values now appear in rows 18, 44 and 71.

ORAL HEARING UNDERTAKING RESPONSE TO ENERGY PROBE RESEARCH FOUNDATION

For the benefit of all parties, Toronto Hydro has identified a further source of discrepancy that relates to corrections Toronto Hydro had previously proposed, and that were subsequently accepted, to Energy Probe's implementation of Toronto Hydro's proposed rate framework also contained in Tab 2. These correction were not carried through to the implementation of the PEG proposal. Specifically, those corrections relate to:

- The estimated capital-related revenue requirement in Energy Probe's Scenarios A and B;
- The formula used to calculate S_{cap} in all three cases; and
- The formula used to calculate revenue requirement, which had incorrectly added $1 million incrementally in each of the years 2016 to 2019, in all three cases.

Finally, Toronto Hydro notes that it disagrees with other elements of PEG's and Energy Probe's proposals/scenarios, but has made no modifications in respect of these disagreements because they do not constitute a discrepancy as noted in this response.

Energy Probe TCQ 49 REVISED March 2, 2015

Consolidated Financial Summary 2011 - 2019- Updated with THESL Corrections												
Toronto Hydro Submission	Approved	Actual	Actual	Estimate	Proposed		Proposed	Proposed	Proposed	Proposed	**Comments**	**References**
	2011	2012	2013	2014	2015		2016	2017	2018	2019		2015-2019: E1B_T02_S03
Operating Revenues	522	536	550.1	570.5	655		687.5	747.4	800.5	843.8	*See Cover Letter Para 11*	2012-2014: Toronto Hydro RRR
Other Revenues	26	19.4	25.4	25.7	46.1		46.8	47.4	48	48.7		Filings and Supporting Materials
Total Revenue	548	555.4	575.5	596.2	701.1		734.3	794.8	848.5	892.5		
Total OM&A Expense	238.6	215.8*	246.4	246.6	265.1		273.3	277.1	281	284.9	*See Cover Letter Para 8*	Past/Test Year data: E4A_T01_S01; *2012 amount is net of 27.7 restructuring costs
Rate Base	2298.2	2534.3	2658.4	2775.6	3247.6		3626.6	3985	4206.7	4422		Information underlying E1B_T02_S03
Capital Factor												
Interest Expense					*80.20*		*89.54*	*98.38*	*103.86*	*109.17*		
Depreciation & Amortization					*206.50*		*221.64*	*248.33*	*266.78*	*287.35*		
Return on Capital (ROE)					*120.90*		*134.97*	*148.31*	*156.56*	*164.57*		
PILs/Income Taxes					*24.1*		*14.75*	*22.60*	*40.31*	*46.52*		
Subtotal Capital-Related RR					*431.60*		*460.9*	*517.60*	*567.50*	*607.60*		
Cn					-		*4.47*	*8.25*	*6.68*	*5.01*		E1B_T02_S03
Scap					-		*0.67*	*0.69*	*0.71*	*0.72*		
PCI					-		*4.94*	*8.68*	*7.09*	*5.41*	**PCI=I-X+Cn-Scap*(I-X)**	
Total Gross Revenue Requirement	548	555.4	575.5	596.2	701.1		734.3	794.7	848.5	892.5		
Other Revenues	-26	-19.4	-25.4	-25.7	-46.1		-46.8	-47.4	-48	-48.7		
RATES REVENUE REQUIREMENT	**522**	**536**	**550.1**	**570.5**	**655**		**687.5**	**747.4**	**800.5**	**843.8**	*See Cover Letter Para 9, 10*	J
Total Debt	1378.9	1520.58	1595.04	1665.36	1948.56		2175.96	2391	2524.02	2653.2	60.00%	4.11%
Common Equity	919.3	1013.72	1063.36	1110.24	1299.04		1450.64	1594	1682.68	1768.8	40.00%	9.30%
Total Rate Base	2298.2	2534.3	2658.4	2775.6	3247.6		3626.6	3985	4206.7	4422	100.00%	6.19% Information underlying E1B_T02_S03
CAPEX and In Service Asset Additions												
Capital Expenditures												
Total System Access Capital	58.3	53.2	86.6	76	86.1		93.5	100.9	90.4	85.5		
Total System Renewal Capital	219.3	157.2	231.1	286.4	251.7		235	246.3	260.1	265.5		
Total System Service Capital	75.6	38.4	83.7	101.3	76.5		69.6	62.5	49.5	73.9		E3A-T06_S02, App 2-AA
Total General Plant Capital	67.7	29.3	33.8	109.5	104.6		99.4	28.9	32.1	27.9		
Other	24.6	9.9	10.5	13.3	10.3		21.2	28.6	37.9	49.4		
Total Distribution Capital	**445.5**	**288.0**	**445.7**	**585.9**	**531.1**		**518.7**	**467.4**	**470.0**	**502.2**		
In-Service Asset Additions												
Total System Access Capital												
Total System Renewal Capital												
Total System Service Capital												
Total General Plant Capital												
Other												
TOTAL ISAs	439.1*	**209.4**	**381.3**	**470.6**	**539.7**		**671.6**	505.7	441	529.9		Interrogatory 2B-SEC-25. *2011 ISA reflects the actual amount.
Variation											*See Cover Letter Para 12*	
OM&A												
Description	**Bd Approv**	**Actual**	**Actual**	**Estimate**	**Test Base**		**Proposed**	**Proposed**	**Proposed**	**Proposed**	**Categories/Taxonomy**	
	2011	**2012**	**2013**	**2014**	**2015**		**2016**	**2017**	**2018**	**2019**		
Operations	59.7	55.9	59.5	58.5	70.3							
Maintenance	56.1	54.8	66.8	59.3	61.2							
Billing and Collecting	40.6	36.0	35.2	37.9	41.5							
Community Relations	2.9	2.9	2.9	2.7	2.7							
Administrative and General	72.6	67.8	75.0	81.2	86.5							
Taxes Other Than Income Taxes	5.9	-2.3	6.4	6.5	6.5							
Donations	0.7	0.7	0.7	0.7	0.8							
TOTAL	**238.6**	**215.8**	**246.4**	**246.6**	**269.5**		**273.3**	**277.1**	**281**	**284.9**	*See Cover Letter Para 8*	Past/Test Year data: E4A_T01_S01;
Variation: Restructuring Costs		27.7										

Energy Probe Exhibit K3.3 REVISED March 2, 2015				Comparison THESL and PEG CUSTOM PCI FORMULAS			Based on PEG Report Table 8 Adjusted to 5yr CIR Plan						
	THESL Formula			As Filed	Corrected per THESL			PEG Formula			Corrected per Dr. Kauffman J3.3, THESL J9.5		
Key Assumptions							**Key Assumptions**						
X Stretch factor	-0.003						X Stretch factor	-0.006					
Cn Stretch factor	0						Cn Stretch factor	-0.004					
Billing Determinant Adjustment	0						Billing Determinant Adjustment	-0.015					
Growth	0						Growth	0					
PCI=(I-X)+Cn-Scap*(I-X)		**PCI Formula Calculation**					**PCI=(I-X)+Cn-Scap*(I-X)**		**PCI Formula Calculation**				
THESL Formulation	2015 Base Y	**2016**	**2017**	**2018**	**2019**	**TOTAL**	**PEG Formulation**	2015 Base Y	**2016**	**2017**	**2018**	**2019**	**TOTAL**
Input Parameters							Input Parameters						
Inflation	N/A	0.017	0.017	0.017	0.017		Inflation	N/A	0.017	0.017	0.017	0.017	
X=Stretch Factor	N/A	-0.003	-0.003	-0.003	-0.003		X=Stretch Factor	N/A	-0.006	-0.006	-0.006	-0.006	
I-X	**0**	**0.014**	**0.014**	**0.014**	**0.014**		**I-X**	**0**	**0.011**	**0.011**	**0.011**	**0.011**	
Base year RR	**655.0**						Base year RR	**655.0**					
Capital-related RR 1BT2S3Table4	431.6	460.9	517.6	567.5	607.6		Capital-related RR 1BT2S3Table4	431.6	460.9	517.6	567.5	607.5	
Cn	0	0.0447	0.0825	0.0668	0.0501		Cn	0	0.0447	0.0841	0.0696	0.0532	
Stretch factor	0	0.0000	0.0000	0.0000	0.0000		Stretch factor	0	-0.0041	-0.0043	-0.0045	-0.0047	
Growth	0	0.000	0.000	0.000	0.000		Billing Determinant Redn	0	-0.01500	-0.01500	-0.01500	-0.01500	
Adjusted Cn		**0.0447**	**0.0825**	**0.0668**	**0.0501**		**Adjusted Cn**		**0.0256**	**0.0648**	**0.0501**	**0.0335**	
Scap Factor[% RR(prior yr)]	0	0.6710	0.6930	0.7090	0.7200		Scap Factor[% RR(prior year)]	0	0.6838	0.7220	0.7552	0.7840	
PCI=[(I-X)+Cn-(Scap*(I-X)]	0	0.0493388	0.0867927	0.0708771	0.05405		**PCI=[(I-X)+Cn-Scap*(I-X)**	0	0.0291082	0.0635104	0.048238	0.0311979	
PCI Escalator %	N/A	4.93	8.68	7.09	5.41		**PCI Escalator %**	N/A	2.91	6.35	4.82	3.12	
Revenue Requirement $ M	**655.00**	**687.32**	**746.97**	**799.91**	**843.15**	**3732.35**	**Revenue Requirement $ M**	**655.00**	**674.07**	**716.88**	**751.46**	**774.90**	**3572.30**
Rate (RR) Increase	14.81%	4.93%	8.68%	7.09%	5.41%	**8.18%**	Rate (RR) Increase	14.81%	2.91%	6.35%	4.82%	3.12%	**6.40%**

*Variance from PEG: PEG's proposal is to add back "Scap*X"

*THESL Correction Carried Forward: Cells corrected to reflect Toronto Hydro's proposed Scap formula.

*THESL Correction Carried Forward: Revenue Requirement calculation incorrectly added $1M to each cell.

Energy Probe SCENARIO A							~20% CAPEX annual Reduction						
	THESL Formula							PEG Formula					
Key Assumptions							**Key Assumptions**						
X Stretch factor	-0.003						X Stretch factor	-0.006					
Cn Stretch factor	0						Cn Stretch factor	-0.004					
Billing Determinant Adjustment	0						Billing Determinant Adjustment	-0.015					
Growth*	0						Growth	0					
PCI=(I-X)+Cn-Scap*(I-X)		**PCI Formula Calculation**					**PCI=(I-X)+Cn-Scap*(I-X)**		**PCI Formula Calculation**				
THESL Formulation	*2015 Base Y*	**2016**	**2017**	**2018**	**2019**	**TOTAL**	**PEG Formulation**	*2015 Base Y*	**2016**	**2017**	**2018**	**2019**	**TOTAL**
Input Parameters							Input Parameters						
Inflation	*N/A*	0.017	0.017	0.017	0.017		Inflation	*N/A*	0.017	0.017	0.017	0.017	
X=Stretch Factor	*N/A*	-0.003	-0.003	-0.003	-0.003		X=Stretch Factor	*N/A*	-0.006	-0.006	-0.006	-0.006	
I-X	***0***	**0.014**	**0.014**	**0.014**	**0.014**		**I-X**	***0***	**0.011**	**0.011**	**0.011**	**0.011**	
Base year RR	***644.2***						Base year RR	***644.2***					
Capital-related RR	***420.8***	**443.4**	**487.1**	**524.8**	**553.4**		**Capital-related RR**	***420.8***	**443.4**	**487.1**	**524.8**	**553.4**	
Cn	*0*	0.0351	0.0652	0.0526	0.0378		Cn	*0*	0.0351	0.0665	0.0546	0.0399	
Stretch factor	*0*	0.0000	0.0000	0.0000	0.0000		Stretch factor	0	-0.0041	-0.0042	-0.0044	-0.0045	
Growth	*0*	0.000	0.000	0.000	0.000		Billing Determinant Redn (growth)	*0*	-0.0150	-0.0150	-0.0150	-0.0150	
Adjusted Cn		**0.0351**	**0.0652**	**0.0526**	**0.0378**		**Adjusted Cn**		**0.0160**	**0.0473**	**0.0352**	**0.0204**	
Scap Factor[% RR(prior yr)]	*0*	0.6619	0.6798	0.6929	0.7012		Scap Factor[% RR(prior year)]	*0*	0.6751	0.7059	0.7326	0.7551	
PCI=[(I-X)+Cn-(Scap*(I-X)]	*0*	0.0398157	0.0697214	0.0569125	0.041947		**PCI=[(I-X)+Cn-(Scap*(I-X)]**	*0*	0.0196056	0.0505314	0.038182	0.023087	
PCI Escalator %	*N/A*	3.98	6.97	5.69	4.19		**PCI Escalator %**	*N/A*	1.96	5.05	3.82	2.31	
Revenue Requirement S M	***644.20***	**669.85**	**716.55**	**757.33**	**789.10**	**3577.03**	**Revenue Requirement $ M**	***644.20***	**656.83**	**690.02**	**716.37**	**732.91**	**3440.32**
Rate (RR) Increase	*12.92%*	3.98%	6.97%	5.69%	4.19%	**6.75%**	Rate (RR) Increase	12.92%	1.96%	5.05%	3.82%	2.31%	**5.21%**

*THESL Correction Carried Forward: Corrected to match values in cells D42 to G42.

*Variance from PEG: PEG's proposal is to add back "Scap*X".

*THESL Correction Carried Forward: Cells corrected to reflect Toronto Hydro's proposed Scap formula.

*THESL Correction Carried Forward: Revenue Requirement calculation incorrectly added $1M to each cell.

Energy Probe SCENARIO B							~20% lower CAPEX + $10 M Annual OM&A Reduction						
	THESL Formula							PEG Formula					
Key Assumptions							**Key Assumptions**						
X Stretch factor	-0.003						X Stretch factor	-0.006					
Cn Stretch factor	0						Cn Stretch factor	-0.004					
Billing Determinant Adjustment	0						Billing Determinant Adjustment	-0.015					
Growth*	0						Growth	0					
PCI=(I-X)+Cn-Scap*(I-X)		**PCI Formula Calculation**					**PCI=(I-X)+Cn-Scap*(I-X)**		**PCI Formula Calculation**				
THESL Formulation	*2015 Base Y*	**2016**	**2017**	**2018**	**2019**	**TOTAL**	**PEG Formulation**	*2015 Base Y*	**2016**	**2017**	**2018**	**2019**	**TOTAL**
Input Parameters							Input Parameters						
Inflation	*N/A*	0.017	0.017	0.017	0.017		Inflation	*N/A*	0.017	0.017	0.017	0.017	
X=Stretch Factor	*N/A*	-0.003	-0.003	-0.003	-0.003		X=Stretch Factor	*N/A*	-0.006	-0.006	-0.006	-0.006	
I-X	***0***	**0.014**	**0.014**	**0.014**	**0.014**		**I-X**	***0***	**0.011**	**0.011**	**0.011**	**0.011**	
Base year RR	***634.2***						Base year RR	***634.2***					
Capital-related RR	***420.8***	***443.4***	***487.1***	***524.8***	***553.4***		**Capital-related RR**	***420.8***	***443.4***	***487.1***	***524.8***	***553.4***	
Cn	*0*	0.0356	0.0662	0.0534	0.0383		Cn	*0*	0.0356	0.0676	0.0554	0.0405	
Stretch factor	*0*	0.0000	0.0000	0.0000	0.0000		Stretch factor	*0*	-0.0041	-0.0043	-0.0045	-0.0046	
Growth	*0*	0.000	0.000	0.000	0.000		Billing Determinant Redn	*0*	-0.01500	-0.01500	-0.01500	-0.01500	
Adjusted Cn		**0.0356**	**0.0662**	**0.0534**	**0.0383**		**Adjusted Cn**		**0.0165**	**0.0483**	**0.0360**	**0.0209**	
Scap Factor[% RR(prior yr)]	*0*	0.6721	0.6897	0.7026	0.7108		Scap Factor[% RR(prior year)]	*0*	0.6855	0.7162	0.7428	0.7653	
PCI=[(I-X)+Cn-(Scap*(I-X)]	*0*	0.040226	0.0705853	0.0575421	0.042339		**PCI=[(I-X)+Cn-(Scap*(I-X)]**	*0*	0.0199819	0.0513804	0.038805	0.0234711	
PCI Escalator %	*N/A*	4.02	7.06	5.75	4.23		**PCI Escalator %**	*N/A*	2.00	5.14	3.88	2.35	
Revenue Requirement S M	***634.20***	**659.71**	**706.28**	**746.92**	**778.54**	**3525.65**	**Revenue Requirement $ M**	***634.20***	**646.87**	**680.11**	**706.50**	**723.08**	**3390.77**
Rate (RR) Increase	***11.17%***	**4.02%**	**7.06%**	**5.75%**	**4.23%**	**6.45%**	**Rate (RR) Increase**	**11.17%**	**2.00%**	**5.14%**	**3.88%**	**2.35%**	**4.91%**
***Growth set at zero per J3.3 Response**													

*THESL Correction Carried Forward: Corrected to match values in cells D69 to G69.

*Variance from PEG: PEG's proposal is to add back "Scap*X".

*THESL Correction Carried Forward: Cells corrected to reflect Toronto Hydro's proposed Scap formula.

*THESL Correction Carried Forward: Revenue Requirement calculation incorrectly added $1M to each cell.

ORAL HEARING UNDERTAKING RESPONSE TO BUILDING OWNERS AND MANAGERS OF THE GREATER TORONTO AREA

UNDERTAKING NO. J9.6:

Reference(s):

To confirm whether reliability issues noted by Redpath will be addressed.

RESPONSE:

Redpath's reliability issues between January 2012 and December 2013 were primarily due to defective primary cable. Toronto Hydro is working to address these issues through a number of projects that target renewal of aging cable fed from Esplanade TS. Toronto Hydro is also planning load transfer work to reduce the overall exposure of the station bus to power quality events and to reduce the load on the station.

The proposed work is planned within the following Distribution System Plan ("DSP") programs (Exhibit 2B):

- Underground Circuit Renewal (Section E6.1)
- Load Demand (Section E5.4)

Mr. Brett also asked about the reliability issues noted by Wrigley. The issues between January 2012 and December 2013 were flagged to various cause codes, including:

- Adverse Weather
- Defective Equipment – Cable – Primary
- Foreign Interference
- Tree Contacts
- Unknown

ORAL HEARING UNDERTAKING RESPONSE TO BUILDING OWNERS AND MANAGERS OF THE GREATER TORONTO AREA

Toronto Hydro is working to address these issues through various projects that target aging assets and that reconfigure existing assets out of high risk areas such as ravines. These projects are generally related to feeders supplied by Leaside TS. There is also work planned to replace assets such as R1 SCADA-Mate switches and defective SMD-20 switches, which will provide Toronto Hydro with improved system flexibility during outages.

The proposed work is planned within the following DSP programs (Exhibit 2B):

- Load Demand (Section E5.4)
- Underground Circuit Renewal (Section E6.1)
- Overhead Infrastructure Relocation (Section E6.5)
- SCADAMATE R1 Renewal (Section E6.8)
- Polymer SMD-20 Renewal (Section E7.6)

These programs are intended to improve the overall reliability of the feeder serving this customer and may also reduce momentary events and voltage sags.