



September 30, 2015

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

Dear Ms. Walli

**Re: Kingston Hydro Corporation – 2016 Custom IR Rate
Application – EB-2015-0083**

Per Kingston Hydro interrogatory response regarding the filing of a lead-lag study for the above noted proceeding, attached please find the Report of Navigant – *Working Capital Requirements of Kingston Hydro's Electricity Distribution Business*, dated September 29, 2015.

Kingston Hydro intends to provide evidence updates that incorporate the results of the lead-lag study along with responses to undertakings that are due to be filed with the Ontario Energy Board by October 2, 2015.

If you have any questions please do not hesitate to contact me.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Nancy Taylor".

Nancy Taylor
Vice-President and Corporate Secretary
613-546-1181 ext. 2460

cc. Mr. Andrew Taylor
Intervenors of record



Working Capital Requirements of Kingston Hydro's Electricity Distribution Business

Prepared for:



Navigant Consulting Ltd.
333 Bay Street
Suite 1250
Toronto, ON, M5H 2R2

www.navigant.com

September 29, 2015





This report (the “report”) was prepared for Kingston Hydro Corporation (“Kingston Hydro”) by Navigant Consulting, Ltd. (“Navigant”). The report was prepared solely for the purposes of Kingston Hydro’s rate filing to before the Ontario Energy Board and may not be used for any other purpose. Use of this report by any third party outside of Kingston Hydro’s rate filing is prohibited. Use of this report should not, and does not, absolve the third party from using due diligence in verifying the report’s contents. Any use which a third party makes of this report, or any reliance on it, is the responsibility of the third party. Navigant extends no warranty to any third party.

Table of Contents

Section I: Executive Summary.....	3
Summary	3
Organization of the Report	4
Section II: Revenue Lags	5
Retail Revenue Lag	5
Service Lag	6
Billing Lag	6
Collections Lag	6
Payment Processing Lag	6
Section III: Expense Leads	8
Cost of Power	8
IESO Cost of Power Expenses	9
Hydro One Cost of Power Expenses	10
Payments to Embedded Generation Customers	10
Payments to Retailers	10
OM&A Expenses	11
Payroll & Benefits	12
Property Taxes	13
Corporate Procurement Card	14
Lease Payments	15
Outside Services	16
Miscellaneous OM&A	17
Debt Retirement Charge (DRC)	18
Payment in Lieu of Taxes (PILs)	19
Interest on Short-Term and Long-Term Debt	20
Harmonized Sales Tax (HST)	21
Section IV: Conclusions	22
Appendix A: Working Capital Methodology.....	25
Appendix B: Detailed Data Tables.....	27
Appendix C: Expert Information	37

List of Tables

Table 1: Summary of Working Capital Requirements.....	3
Table 2: Kingston Hydro Distribution Working Capital Requirements (2014).....	3
Table 3: Summary of Revenue Lag.....	5
Table 4: Summary of Retail Revenue Lag	6
Table 5: Summary of Cost of Power Expenses	8
Table 6: Summary of IESO Cost of Power Expenses	9
Table 7: Summary of Hydro One Cost of Power Expenses	10
Table 8: Summary of OM&A Expenses	11
Table 9: Summary of Payroll & Benefits Expenses	12
Table 10: Summary of Property Tax Expenses	13
Table 11: Summary of Corporate Procurement Card Expenses	14
Table 12: Summary of Lease Expenses	15
Table 13: Summary of Outside Services Expenses	16
Table 14: Summary of Miscellaneous OM&A Expenses	17
Table 15: Summary of DRC Expenses.....	18
Table 16: Summary of PILs Expenses	19
Table 17: Summary of Interest Expenses.....	20
Table 18: Summary of HST Working Capital Amounts	21
Table 19: Kingston Hydro Distribution Working Capital Requirements (2014).....	22
Table 20: Kingston Hydro Distribution Working Capital Requirements (2015).....	22
Table 21: Kingston Hydro Distribution Working Capital Requirements (2016).....	23
Table 22: Kingston Hydro Distribution Working Capital Requirements (2017).....	23
Table 23: Kingston Hydro Distribution Working Capital Requirements (2018).....	24
Table 24: Kingston Hydro Distribution Working Capital Requirements (2019).....	24
Table 25: Summary of Other Revenues	27
Table 26: Summary of Payroll Expenses.....	27
Table 27: Summary of Withholdings Expenses	28
Table 28: Summary of Payroll Expenses.....	30
Table 29: Summary of Withholdings Expenses	31
Table 30: Summary of Pension Expenses	33
Table 31: Summary of Group Medical and Dental Expenses	33
Table 32: Summary of Group Life Insurance Expenses.....	34
Table 33: Summary of Long-term Disability Expenses	34
Table 34: Summary of EHT Expenses	35
Table 35: Summary of WSIB Expenses	35
Table 36: Summary of United Way Expenses.....	36
Table 37: Summary of Social Club Expenses	36

Section I: Executive Summary

Summary

This report provides the results of the working capital requirements of Kingston Hydro's distribution business.

Performing a lead-lag study requires two key undertakings:

1. Developing an understanding of how the regulated distribution business operates in terms of products and services sold to customers/purchased from vendors, and the policies and procedures that govern such transactions; and,
2. Modeling such operations using data from a relevant period of time and a representative data set. It is important to ascertain and factor into the study whether (or not) there are known changes to existing business policies and procedures going forward. Where such changes are known and material, they should be factored into the study.

Results from the lead-lag study using 2014 data identify the following working capital amount in Table 1, below.

Table 1: Summary of Working Capital Requirements

Year	2014	2015	2016	2017	2018	2019
Percentage of OMA	8.11%	8.05%	7.88%	7.99%	8.01%	8.03%
Working Capital Requirement, including HST	\$ 6,585,707	\$ 7,664,456	\$ 7,485,446	\$ 7,550,545	\$ 7,510,808	\$ 7,534,157

Table 2, below summarizes the detailed working capital requirements for the 2014 test year, considering known and measurable changes calculated in the study. Detailed working capital requirements for each subsequent year can be found in Section IV: Conclusions.

Table 2: Kingston Hydro Distribution Working Capital Requirements (2014)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses	Working Capital Requirements
Cost of Power	58.92	34.01	24.91	6.82%	\$ 75,210,675	\$ 5,132,065
OM&A Expenses	58.92	17.19	41.73	11.43%	\$ 6,024,250	\$ 688,742
DRC	58.92	27.56	31.36	8.59%	\$ 3,575,975	\$ 307,261
PILS	58.92	(2.93)	61.85	16.95%	\$ 342,504	\$ 58,041
Interest	58.92	4.65	54.27	14.87%	\$ 1,291,863	\$ 192,069
Total					\$ 86,445,267	\$ 6,378,178
HST						\$ 207,529
Total - Including HST						\$ 6,585,707
Working Capital as a Percent of OM&A incl. Cost of Power						8.11%

Organization of the Report

Section II of the report discusses the lag times associated with Kingston Hydro's collections of revenues. The section includes a description of the sources revenues and how an overall revenue lag is derived.

Section III presents the lead times associated with Kingston Hydro's expenses. The section includes a description of the types of expenses incurred by Kingston Hydro's distribution operations and how expenses are treated for the purposes of deriving an overall expenses lead.

Section IV presents a summary of the results from the study.

Section II: Revenue Lags

A distribution utility providing service to its customers generally derives its revenue from bills paid for service by its customers. A revenue lag represents the number of days from the date service is rendered by Kingston Hydro until the date payments are received from customers and funds are available to Kingston Hydro.

Interviews with Kingston Hydro personnel indicate that its distribution business receives funds from the following funding streams:

1. Retail Customers; and,
2. Other Sources (revenues from miscellaneous service charges, interest revenue, rentals, and sale of scrap by Kingston Hydro).

Kingston Hydro currently takes into account the Ontario Clean Energy Benefit (OCEB) when billing customers and is reimbursed for OCEB through the settlement processes with the Independent Electricity System Operator (IESO). The OCEB is expected to cease December 31, 2015. OCEB was removed from retail revenues in this study to reflect this known and measurable change. Kingston Hydro currently charges both residential and non-residential customers for the Debt Retirement Charge (DRC) and remits the DRC collected from customers to the Ontario Electricity Financial Corporation (OEFC). O.Reg 156/15 exempts residential customers from paying DRC on electricity consumed after December 31, 2015. DRC was removed from residential customers' retail revenues in this study to reflect this known and measurable change.

The lag times associated with the funding streams above and considering the known and measurable changes described were weighted and combined to calculate an overall revenue lag time as shown below. Detailed data tables are provided in Appendix B.

Table 3: Summary of Revenue Lag

Description	Revenues	Lag Days	Weighting	Weighted Lag
Retail Revenue	\$ 89,559,354	58.74	99.50%	58.45
Other Revenue	\$ 448,647	94.52	0.50%	0.47
Total	\$ 90,008,002		100.00%	58.92

Retail Revenue Lag

Retail Revenue lag consists of the following components:

1. Service Lag;
2. Billing Lag;
3. Collections Lag; and,
4. Payment Processing Lag.

The lag times for each of the above components, when added together, results in the Retail Revenue Lag for the purpose of calculating the working capital requirements for Kingston Hydro's distribution business. The components are intended to represent a continuous process from the end date of the customer's previous billing cycle to the date in which the payment is available to Kingston Hydro. Figure 1 illustrates the start and end point for each component of Kingston Hydro's retail revenue lag.

Figure 1: Retail Revenue Lag

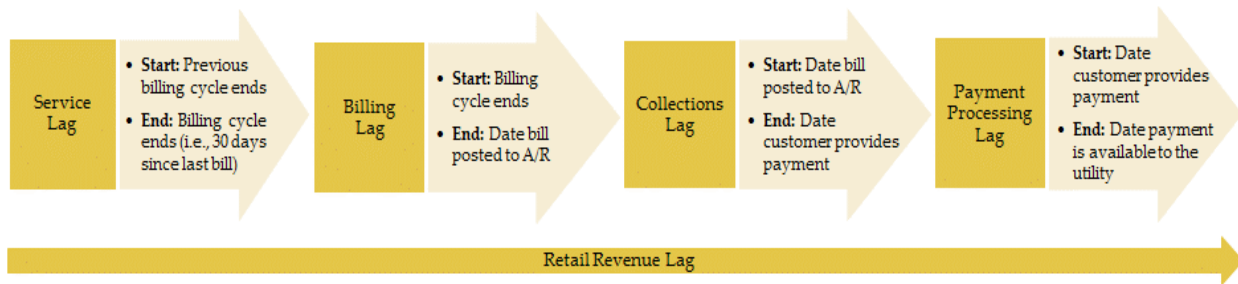


Table 4, below summarizes the total Retail Revenue Lag.

Table 4: Summary of Retail Revenue Lag

Description	Lag Days
Service Lag	15.21
Billing Lag	19.29
Collections Lag	23.10
Payment Processing Lag	1.14
Total	58.74

The estimation of each component of the Retail Revenue Lag is described below.

Service Lag

The Service Lag is the time from Kingston Hydro's provision of electricity to a customer, to the time the customer's service period ends, which is typically defined as when the meter is read. Using the information provided, the Service Lag was estimated to be 15.21 days.

Billing Lag

The Billing Lag is the time period from when the customer's service period ends, which is typically defined as when the meter is read, and the time that the customer's bill is posted to accounts receivable. Interviews with billing staff and data provided indicated that Kingston Hydro customers have an average billing lag of 19.29 days in 2014.

Collections Lag

The Collections Lag is the time period from when the bill is posted to accounts receivable, until the time when the customer provides a payment to Kingston Hydro. The Collections Lag is measured by analyzing the receivables aging data provided by Kingston Hydro. Kingston Hydro's Collection lag was calculated to be 23.10 days for Kingston Hydro's distribution operations.

Payment Processing Lag

The Payment Processing lag is the time period from when the customer provides a payment to Kingston Hydro until such time as the funds associated with that payment are available to the company. The Payment Processing Lag is measured by analyzing the payment methods used by Kingston Hydro customers. Some examples of the payment methods used include credit card, pre-authorized payment and



cash or cheque payments. Kingston Hydro provided the processing time associated with each method of payment and the number of customers using each method of payment. Using such data provided by Kingston Hydro for the calendar year 2014, a customer-weighted average payment processing lag of 1.14 days was determined for Kingston Hydro's distribution operations.

Section III: Expense Leads

Expense Leads are defined as the time period between when a service is provided to Kingston Hydro and when payment is remitted for that service. Typically services are provided in advance of payment which reduces the capital requirement of the company. Therefore, in conjunction with the calculation of the revenue lag, expense lead times were calculated for the following items:

1. Cost of Power;
2. OM&A Expenses;
3. Debt Retirement Charge (DRC);
4. Payments in Lieu of Taxes;
5. Interest Expenses; and,
6. Harmonized Sales Tax.

Cost of Power

For the purpose of the distribution lead-lag study, cost of power expenses were considered to consist of payments made by Kingston Hydro to its vendors in the following categories:

1. Independent Electricity System Operator (IESO) Cost of Power Expenses;
2. Hydro One Cost of Power Expenses;
3. Payments to Embedded Generation Customers; and,
4. Payments to Retailers.

Expense lead times were calculated individually for each of the items listed above and then dollar-weighted to derive a composite expense lead time of 34.01 days for cost of power expenses.

Table 5: Summary of Cost of Power Expenses

Description	Amounts	Expense Lead Time	Weighting	Weighted Lead Time
IESO Cost of Power	\$ 68,726,373	32.64	91.38%	29.82
Hydro One Cost of Power	\$ 5,274,566	49.92	7.01%	3.50
Payments to Embedded Generation Customers	\$ 1,118,326	44.84	1.49%	0.67
Payments to Retailers	\$ 91,411	17.75	0.12%	0.02
Total	\$ 75,210,675		100.00%	34.01

IESO Cost of Power Expenses

Kingston Hydro purchases its power supply requirements on a monthly basis from the IESO and pays for such supplies on a schedule defined by the IESO's billing and settlement procedures. Taking the information on actual payments made by Kingston Hydro in 2014, a dollar-weighted IESO Cost of Power expense lead time of 32.64 days was calculated. Table 6 below summarizes the components of the Cost of Power expense lead calculation.

Table 6: Summary of IESO Cost of Power Expenses

Delivery Period	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	1/17/2014	\$ 7,055,058	15.50	17.00	32.50	10.27%	3.34
Feb-14	2/19/2014	\$ 8,083,681	15.50	19.00	34.50	11.76%	4.06
Mar-14	3/18/2014	\$ 8,062,752	14.00	18.00	32.00	11.73%	3.75
Apr-14	4/16/2014	\$ 6,534,194	15.50	16.00	31.50	9.51%	2.99
May-14	5/16/2014	\$ 3,566,421	15.00	16.00	31.00	5.19%	1.61
Jun-14	6/17/2014	\$ 4,036,262	15.00	18.00	33.00	5.87%	1.94
Jul-14	7/17/2014	\$ 5,037,366	15.00	17.00	32.00	7.33%	2.35
Aug-14	8/19/2014	\$ 5,424,751	15.50	19.00	34.50	7.89%	2.72
Sep-14	9/17/2014	\$ 4,842,186	15.50	17.00	32.50	7.05%	2.29
Oct-14	10/17/2014	\$ 4,836,113	15.00	17.00	32.00	7.04%	2.25
Nov-14	11/19/2014	\$ 5,194,257	15.50	19.00	34.50	7.56%	2.61
Dec-14	12/16/2014	\$ 6,053,332	15.00	16.00	31.00	8.81%	2.73
Total		\$ 68,726,373				100.00%	32.64

Hydro One Cost of Power Expenses

Kingston Hydro provides payment to Hydro One for Cost of Power expenses on a monthly basis and pays for such charges on a monthly basis. Based upon information on payments made by Kingston Hydro in 2014, a dollar-weighted Hydro One Cost of Power expense lead time of 49.92 days was calculated. Table 7, below summarizes the components of the Hydro One Cost of Power expense lead calculation.

Table 7: Summary of Hydro One Cost of Power Expenses

Delivery Period	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	2/11/2014	\$ 524,922	16.50	32.00	48.50	9.95%	4.83
Feb-14	3/18/2014	\$ 502,133	16.00	36.00	52.00	9.52%	4.95
Mar-14	4/15/2014	\$ 511,330	15.50	34.00	49.50	9.69%	4.80
Apr-14	5/13/2014	\$ 457,766	14.50	34.00	48.50	8.68%	4.21
May-14	6/10/2014	\$ 417,063	15.50	32.00	47.50	7.91%	3.76
Jun-14	7/15/2014	\$ 432,472	17.00	34.00	51.00	8.20%	4.18
Jul-14	8/12/2014	\$ 395,618	15.50	32.00	47.50	7.50%	3.56
Aug-14	9/9/2014	\$ 365,318	16.50	28.00	44.50	6.93%	3.08
Sep-14	10/7/2014	\$ 416,262	15.50	26.00	41.50	7.89%	3.28
Oct-14	11/18/2014	\$ 379,980	15.00	39.00	54.00	7.20%	3.89
Nov-14	12/31/2014	\$ 389,594	16.50	50.00	66.50	7.39%	4.91
Dec-14	1/13/2015	\$ 482,109	15.00	34.00	49.00	9.14%	4.48
Total		\$ 5,274,566				100.00%	49.92

Payments to Embedded Generation Customers

Kingston Hydro purchases power supply from cogeneration, Feed-in-Tariff (FIT) and micro Feed-in-Tariff (MFIT) customers on a monthly basis according to each customer's billing cycle. Kingston Hydro provided transaction level data by payment type (cheque or EFT), invoice date, payment date, and amount. Using the data provided and the service and billing lag components from the retail revenue lag, a dollar-weighted expense lead time of 44.84 days in 2014 was calculated.

Payments to Retailers

Kingston Hydro remits payments to retailers for applicable revenues collected from customers on retailer billing. Kingston Hydro submits invoices to retailers the same day customers are billed. Once the retailer accepts the invoice amount, all payments are aggregated in a weekly report and funds are electronically transferred. Note that payments can be positive or negative. Using payment information in 2014 and retail revenue lags determined from the revenue analysis, a dollar-weighted expense net lead time of 17.75 days was calculated.

OM&A Expenses

For the purpose of the distribution lead-lag study, OM&A expenses were considered to consist of payments made by Kingston Hydro to its vendors in the following categories:

1. Payroll & Benefits;
2. Property Taxes;
3. Corporate Procurement Card;
4. Lease Payments;
5. Outside Services; and,
6. Miscellaneous OM&A.

Expense lead times were calculated individually for each of the items listed above and then dollar-weighted to derive a composite expense lead time of 17.19 days for OM&A expenses.

Table 8: Summary of OM&A Expenses

Description	Amounts	Expense Lead Time	Weighting	Weighted Lead Time
Payroll & Benefits	\$ 3,644,366	20.22	60.49%	12.23
Property Taxes	\$ 133,671	(53.85)	2.22%	(1.19)
Corporate Procurement Card	\$ 25,643	15.14	0.43%	0.06
Lease Payments	\$ 421,673	6.48	7.00%	0.45
Outside Services	\$ 282,572	45.55	4.69%	2.14
Miscellaneous OM&A	\$ 1,516,325	13.90	25.17%	3.50
Total	\$ 6,024,250		100.00%	17.19

Payroll & Benefits

The following items were considered to be expenses related to the Payroll & Benefits of Kingston Hydro:

1. Two types of payroll including union and non-union payroll;
2. Three types of payroll withholdings including the Canada Pension Plan, Employment Insurance, and Income Tax withholdings;
3. Contributions made for OMERS;
4. Group Health, Dental, and Life Insurance related administrative fees and claims, and long-term disability;
5. Payments made by Kingston Hydro for Employer Health Tax (EHT);
6. Payments made by Kingston Hydro for the Workplace Safety and Insurance Board (WSIB); and,
7. Payments made with respect to deductions in payroll to the social/athletic club and United Way.

When all Payroll, Withholdings and Benefits were dollar-weighted using actual payment data, the weighted average expense lead time associated with Payroll & Benefits was determined to be 20.22 days as shown in Table 9, below. Additional detail can be found in Appendix B.

Table 9: Summary of Payroll & Benefits Expenses

Description	Amounts	Expense Lead Time	Weighting	Weighted Lead Time
Payroll (Union)	\$ 1,429,397	13.96	39.22%	5.48
Withholdings (Union)	\$ 510,692	21.70	14.01%	3.04
Payroll (Non-Union)	\$ 571,296	13.96	15.68%	2.19
Withholdings (Non-Union)	\$ 220,495	21.32	6.05%	1.29
Pensions	\$ 600,718	42.24	16.48%	6.96
Group Life Insurance	\$ 21,864	28.00	0.60%	0.17
Group Medical & Dental	\$ 160,356	(2.38)	4.40%	(0.10)
Long-Term Disability	\$ 33,244	27.99	0.91%	0.26
EHT	\$ 60,615	30.86	1.66%	0.51
WSIB	\$ 31,741	45.59	0.87%	0.40
United Way	\$ 2,849	30.81	0.08%	0.02
Social/Athletic Club	\$ 1,099	30.20	0.03%	0.01
Total	\$ 3,644,366		100.00%	20.22

Property Taxes

Kingston Hydro makes property tax payments for the City of Kingston in two installments. Property taxes are also remitted to the OEFC in two installments. Using the payment dates and amounts associated with Kingston Hydro's distribution business for calendar year 2014, a dollar-weighted expense lead (-lag) time of negative 53.85 days was determined. Table 10, below summarizes the property tax expense lead calculation.

Table 10: Summary of Property Tax Expenses

Description	Amounts	Service Lead Time	Weighting Factor %	Weighted Lead Time
City of Kingston	\$ 126,662	(55.54)	94.76%	(52.63)
Ontario Electricity Financial Corporation	\$ 7,009	(23.26)	5.24%	(1.22)
Total	\$ 133,671		100.00%	(53.85)

Corporate Procurement Card

Procurement (or charge) cards are used by Kingston Hydro for a variety of company related reasons including, and not limited to, purchases of materials in the field, incidental expenses, and to settle charges for travel and accommodation. Based on invoice and payment information provided by Kingston Hydro, a dollar-weighted expense lead time of 15.14 days was determined. Table 11 below summarizes the components of the corporate procurement card expense lead calculation.

Table 11: Summary of Corporate Procurement Card Expenses

Delivery Period	Amounts	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	\$ 2,370	15.65	9.24%	1.45
Feb-14	\$ 2,549	15.50	9.94%	1.54
Mar-14	\$ 2,408	21.15	9.39%	1.99
Apr-14	\$ 2,237	18.45	8.73%	1.61
May-14	\$ 2,818	12.90	10.99%	1.42
Jun-14	\$ 1,193	13.20	4.65%	0.61
Jul-14	\$ 2,138	7.52	8.34%	0.63
Aug-14	\$ 1,059	14.78	4.13%	0.61
Sep-14	\$ 2,609	17.13	10.17%	1.74
Oct-14	\$ 4,033	15.98	15.73%	2.51
Nov-14	\$ 1,121	16.33	4.37%	0.71
Dec-14	\$ 1,108	7.35	4.32%	0.32
Total	\$ 25,643		100.00%	15.14

Lease Payments

Using actual payment dates and amounts provided by Kingston Hydro for three leases, a dollar-weighted lease expense lead time of 6.48 days was determined. Table 12, below summarizes the components of the lease expense lead calculation.

Table 12: Summary of Lease Expenses

Delivery Period	Amounts	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	\$ 15,558	(6.00)	3.69%	(0.22)
Feb-14	\$ 54,280	7.62	12.87%	0.98
Mar-14	\$ 34,919	3.92	8.28%	0.32
Apr-14	\$ 34,919	15.00	8.28%	1.24
May-14	\$ 34,919	7.93	8.28%	0.66
Jun-14	\$ 34,919	3.42	8.28%	0.28
Jul-14	\$ 34,919	5.70	8.28%	0.47
Aug-14	\$ 34,919	4.36	8.28%	0.36
Sep-14	\$ 34,919	2.08	8.28%	0.17
Oct-14	\$ 37,123	15.50	8.80%	1.36
Nov-14	\$ 35,139	3.93	8.33%	0.33
Dec-14	\$ 35,139	6.20	8.33%	0.52
Total	\$ 421,673	69.65	100.00%	6.48

Outside Services

Kingston Hydro engages outside services to provide assistance in the areas of engineering, information technology, accounting, and general consulting. Based on 2014 transactions in Kingston Hydro's accounts payable system under the outside services category, a dollar-weighted expense lead time of 45.55 days was determined. Table 13, below summarizes the components of outside services expense lead calculation.

Table 13: Summary of Outside Services Expenses

Payment Month	Amounts	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	\$ 1,590	33.62	0.56%	0.19
Feb-14	\$ 15,961	44.37	5.65%	2.51
Mar-14	\$ 8,015	46.14	2.84%	1.31
Apr-14	\$ 67,178	51.39	23.77%	12.22
May-14	\$ 17,394	43.40	6.16%	2.67
Jun-14	\$ 27,330	36.82	9.67%	3.56
Jul-14	\$ 33,387	45.77	11.82%	5.41
Aug-14	\$ 18,396	41.15	6.51%	2.68
Sep-14	\$ 25,495	49.56	9.02%	4.47
Oct-14	\$ 23,439	41.73	8.29%	3.46
Nov-14	\$ 19,435	46.23	6.88%	3.18
Dec-14	\$ 24,952	44.10	8.83%	3.89
Total	\$ 282,572		100.00%	45.55

Miscellaneous OM&A

The Miscellaneous OM&A category includes items such as office supplies, repair and maintenance, postage and shipping, and tree trimming to Kingston Hydro. Based on 2014 transactions in Kingston Hydro's accounts payable system under the Miscellaneous OM&A category, a dollar-weighted expense lead time of 13.90 days was derived. Table 14, below summarizes the components of miscellaneous OM&A expense lead calculation.

Table 14: Summary of Miscellaneous OM&A Expenses

Category	Amounts	Weighted Lead Days (by category)	Weighting Factor %	Weighted Lead Time
Miscellaneous	\$ 271,761	9.92	17.92%	1.78
Office Supplies	\$ 12,910	46.00	0.85%	0.39
Repair and Maintenance Supplies	\$ 22,164	47.01	1.46%	0.69
Clothing/Protective Clothing etc.	\$ 17,187	48.34	1.13%	0.55
Education, Training and Fees and Memberships	\$ 91,529	19.70	6.04%	1.19
Advertising, Printing and Promotions	\$ 14,193	62.44	0.94%	0.58
Cell Phones and Other Devices	\$ 14,401	64.68	0.95%	0.61
Postage and Shipping	\$ 135,699	15.32	8.95%	1.37
Legal, Insurance and Audit fees	\$ 107,672	(107.51)	7.10%	(7.63)
Software Network Sup	\$ 129,675	85.50	8.55%	7.31
Tree Trimming	\$ 148,972	15.32	9.82%	1.50
Allocated Admin	\$ 550,161	15.29	36.28%	5.55
Total	\$ 1,516,325		100.00%	13.90

Debt Retirement Charge (DRC)

Kingston Hydro makes payments for the debt retirement charge on a monthly basis to the Ontario Electricity Financial Corporation. O.Reg 156/15 exempts residential customers from paying DRC on electricity consumed after December 31, 2015. This has been modeled as a known and measurable change and only DRC to non-residential customers is included in the model. Using payment amounts that were made in calendar year 2014, a dollar-weighted expense lead time of 27.56 days was determined for DRC. Table 15, below summarizes the components of the DRC expense lead calculation.

Table 15: Summary of DRC Expenses

Delivery Period	Amounts	Weighting Factor %	Payment Date	Service Lead Time	Payment Lead Time	Total Lead Time	Weighted Lead Time
Feb-14	\$ 340,171	9.51%	2/6/2014	15.00	9.00	24.00	2.28
Mar-14	\$ 327,430	9.16%	3/13/2014	14.00	15.00	29.00	2.66
Apr-14	\$ 341,653	9.55%	4/10/2014	15.50	12.00	27.50	2.63
May-14	\$ 301,683	8.44%	5/8/2014	15.00	10.00	25.00	2.11
Jun-14	\$ 291,184	8.14%	6/12/2014	15.00	15.00	30.00	2.44
Jul-14	\$ 270,380	7.56%	7/10/2014	15.00	12.00	27.00	2.04
Aug-14	\$ 289,169	8.09%	8/7/2014	15.50	9.00	24.50	1.98
Sep-14	\$ 293,882	8.22%	9/16/2014	15.50	17.00	32.50	2.67
Oct-14	\$ 287,876	8.05%	10/14/2014	15.00	15.00	30.00	2.42
Nov-14	\$ 291,344	8.15%	11/11/2014	15.50	12.00	27.50	2.24
Dec-14	\$ 297,147	8.31%	12/9/2014	15.00	10.00	25.00	2.08
Jan-15	\$ 244,056	6.82%	1/13/2015	15.50	14.00	29.50	2.01
Total	\$ 3,575,975	100.00%					27.56

Payment in Lieu of Taxes (PILs)

Kingston Hydro makes payments in lieu of taxes in installments to the relevant taxing authorities. Using payment amounts that were made in calendar year 2014, a dollar-weighted expense lead time of negative 2.93 days was determined for PILs. Table 16, below summarizes the components of the PILS expense lead calculation.

Table 16: Summary of PILs Expenses

Delivery Period	Amounts	Payment Date	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
2014	\$ 32,638	3/18/2014	182.50	(288.00)	(105.50)	9.53%	(10.05)
2014	\$ 32,638	3/18/2014	182.50	(288.00)	(105.50)	9.53%	(10.05)
2014	\$ 32,638	3/18/2014	182.50	(288.00)	(105.50)	9.53%	(10.05)
2014	\$ 32,638	3/18/2014	182.50	(288.00)	(105.50)	9.53%	(10.05)
2014	\$ 32,638	5/8/2014	182.50	(237.00)	(54.50)	9.53%	(5.19)
2014	\$ 32,638	6/17/2014	182.50	(197.00)	(14.50)	9.53%	(1.38)
2014	\$ 3,966	7/7/2014	182.50	(177.00)	5.50	1.16%	0.06
2014	\$ 28,542	8/11/2014	182.50	(142.00)	40.50	8.33%	3.38
2014	\$ 28,542	9/15/2014	182.50	(107.00)	75.50	8.33%	6.29
2014	\$ 28,542	10/16/2014	182.50	(76.00)	106.50	8.33%	8.88
2014	\$ 28,542	11/14/2014	182.50	(47.00)	135.50	8.33%	11.29
2014	\$ 28,542	12/16/2014	182.50	(15.00)	167.50	8.33%	13.96
Total	\$ 342,504					100.00%	(2.93)

Interest on Short-Term and Long-Term Debt

Kingston Hydro makes interest payments on nine debt instruments. Payments on temporary borrowing (operating and non-operating) are made monthly, typically in the third week of the month. Payments on Facility three are made quarterly in the first month of the quarter. The Infrastructure Ontario Loan is paid twice per year at the end of the period. Interest swaps are paid monthly. Table 17, below summarizes the components of the interest expense lead calculation. Taking into account the various long term and short term debt instruments, a dollar-weighted expense lead time of 4.65 days was determined for the 2014 calendar year.

Table 17: Summary of Interest Expenses

Description	Amounts	Expense Lead Time	Weighting Factor %	Weighted Lead Time
Temporary Borrowing	\$ 115,418	7.85	17.67%	1.39
Facility 3	\$ 58,265	(30.80)	8.92%	(2.75)
Infrastructure Ontario Loan	\$ 134,103	77.75	20.53%	15.96
Interest Swap 3	\$ 90,971	3.54	13.93%	0.49
Interest Swap 4	\$ 52,279	5.28	8.00%	0.42
Interest Swap 5	\$ 131,600	(10.78)	20.15%	(2.17)
Interest Swap 6	\$ 62,285	1.29	9.54%	0.12
Temporary Borrowing Operating	\$ 8,250	13.80	1.26%	0.17
City of Kingston	\$ 638,692	(4.54)	49.44%	(2.25)
Total	\$ 1,291,863		100.00%	4.65

Harmonized Sales Tax (HST)

The expense lead times associated with the following items that attract HST were considered in Kingston Hydro's distribution lead-lag study.

1. Revenues;
2. Cost of Power; and,
3. OM&A¹.

A summary of the expense lead times and working capital amounts associated with each of the above items is provided in Table 18. Note that the statutory approach described at the outset was used to determine the expense lead times associated with Kingston Hydro's remittances and disbursements of HST (i.e., remittances are generally on the last day of the month following the date of the applicable return).

Table 18: Summary of HST Working Capital Amounts

Description	HST Lead Time	Working Capital Factor	2014	2015	2016	2017	2018	2019
Revenues	(31.11)	-8.52%	\$ (992,288)	\$ (1,209,354)	\$ (1,193,539)	\$ (1,140,594)	\$ (1,135,640)	\$ (1,139,632)
Cost of Power	43.62	11.95%	\$ 1,168,577	\$ 1,372,589	\$ 1,361,441	\$ 1,355,812	\$ 1,342,370	\$ 1,341,279
OM&A Expenses	36.86	10.10%	\$ 31,240	\$ 52,954	\$ 55,263	\$ 56,374	\$ 57,350	\$ 58,344
Total			\$ 207,529	\$ 216,190	\$ 223,165	\$ 271,592	\$ 264,080	\$ 259,990

¹ Costs within OM&A that attract HST include Corporate Procurement Card, Outside Services, and Miscellaneous OM&A.

Section IV: Conclusions

Using the results described under the discussion of revenue lags and expense leads, and applying them to Kingston Hydro's distribution expenses for 2014 (including known and measurable changes), and 2015 to 2020 based on Kingston Hydro's planning inputs. Kingston Hydro's working capital requirements were determined. Table 19 to Table 24 summarize the working capital requirements for 2014 to 2019 calculated in the study.

Table 19: Kingston Hydro Distribution Working Capital Requirements (2014)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses	Working Capital Requirements
Cost of Power	58.92	34.01	24.91	6.82%	\$ 75,210,675	\$ 5,132,065
OM&A Expenses	58.92	17.19	41.73	11.43%	\$ 6,024,250	\$ 688,742
DRC	58.92	27.56	31.36	8.59%	\$ 3,575,975	\$ 307,261
PILS	58.92	(2.93)	61.85	16.95%	\$ 342,504	\$ 58,041
Interest	58.92	4.65	54.27	14.87%	\$ 1,291,863	\$ 192,069
Total					\$ 86,445,267	\$ 6,378,178
HST						\$ 207,529
Total - Including HST						\$ 6,585,707
Working Capital as a Percent of OM&A incl. Cost of Power						8.11%

Table 20: Kingston Hydro Distribution Working Capital Requirements (2015)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses	Working Capital Requirements
Cost of Power	58.92	34.01	24.91	6.82%	\$ 88,341,069	\$ 6,028,029
OM&A Expenses	58.92	17.19	41.73	11.43%	\$ 6,858,652	\$ 784,138
DRC	58.92	27.56	31.36	8.59%	\$ 4,971,015	\$ 427,128
PILS	58.92	(2.93)	61.85	16.95%	\$ 214,216	\$ 36,301
Interest	58.92	4.65	54.27	14.87%	\$ 1,161,386	\$ 172,671
Total					\$ 101,546,338	\$ 7,448,266
HST						\$ 216,190
Total - Including HST						\$ 7,664,456
Working Capital as a Percent of OM&A incl. Cost of Power						8.05%

Table 21: Kingston Hydro Distribution Working Capital Requirements (2016)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses	Working Capital Requirements
Cost of Power	58.92	34.01	24.91	6.80%	\$ 87,863,612	\$ 5,979,068
OM&A Expenses	58.92	17.19	41.73	11.40%	\$ 7,130,810	\$ 813,026
DRC	58.92	27.56	31.36	8.57%	\$ 2,823,912	\$ 241,978
PILS	58.92	(2.93)	61.85	16.90%	\$ 227,171	\$ 38,391
Interest	58.92	4.65	54.27	14.83%	\$ 1,280,213	\$ 189,817
Total					\$ 99,325,718	\$ 7,262,280
HST						\$ 223,165
Total - Including HST						\$ 7,485,446
Working Capital as a Percent of OM&A incl. Cost of Power						7.88%

Table 22: Kingston Hydro Distribution Working Capital Requirements (2017)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses	Working Capital Requirements
Cost of Power	58.92	34.01	24.91	6.82%	\$ 87,261,261	\$ 5,954,347
OM&A Expenses	58.92	17.19	41.73	11.43%	\$ 7,253,351	\$ 829,263
DRC	58.92	27.56	31.36	8.59%	\$ 2,795,569	\$ 240,205
PILS	58.92	(2.93)	61.85	16.95%	\$ 260,323	\$ 44,114
Interest	58.92	4.65	54.27	14.87%	\$ 1,419,348	\$ 211,024
Total					\$ 98,989,852	\$ 7,278,954
HST						\$ 271,592
Total - Including HST						\$ 7,550,545
Working Capital as a Percent of OM&A incl. Cost of Power						7.99%

Table 23: Kingston Hydro Distribution Working Capital Requirements (2018)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses	Working Capital Requirements
Cost of Power	58.92	34.01	24.91	6.82%	\$ 86,396,142	\$ 5,895,315
OM&A Expenses	58.92	17.19	41.73	11.43%	\$ 7,378,017	\$ 843,516
DRC	58.92	27.56	31.36	8.59%	\$ 2,779,842	\$ 238,854
PILS	58.92	(2.93)	61.85	16.95%	\$ 328,052	\$ 55,592
Interest	58.92	4.65	54.27	14.87%	\$ 1,435,679	\$ 213,452
Total					\$ 98,317,732	\$ 7,246,728
HST						\$ 264,080
Total - Including HST						\$ 7,510,808
Working Capital as a Percent of OM&A incl. Cost of Power						8.01%

Table 24: Kingston Hydro Distribution Working Capital Requirements (2019)

Description	Revenue Lag Days	Expense Lead Days	Net Lag Days	Working Capital Factor	Expenses	Working Capital Requirements
Cost of Power	58.92	34.01	24.91	6.82%	\$ 86,325,895	\$ 5,890,522
OM&A Expenses	58.92	17.19	41.73	11.43%	\$ 7,504,848	\$ 858,017
DRC	58.92	27.56	31.36	8.59%	\$ 2,757,724	\$ 236,954
PILS	58.92	(2.93)	61.85	16.95%	\$ 385,492	\$ 65,325
Interest	58.92	4.65	54.27	14.87%	\$ 1,502,254	\$ 223,350
Total					\$ 98,476,213	\$ 7,274,167
HST						\$ 259,990
Total - Including HST						\$ 7,534,157
Working Capital as a Percent of OM&A incl. Cost of Power						8.03%

Appendix A: Working Capital Methodology

Working capital is the amount of funds that are required to finance the day-to-day operations of a regulated utility and which are included as part of a rate base for ratemaking purposes. A lead-lag study is the most accurate basis for determination of working capital and was used by Navigant for this purpose.

A lead-lag study analyzes the time between the date customers receive service and the date that customers' payments are available to Kingston Hydro (or "lag") together with the time between which Kingston Hydro receives goods and services from its vendors and pays for them at a later date (or "lead")². "Leads" and "Lags" are both measured in days and are dollar-weighted where appropriate.³ The dollar-weighted net lag (lag minus lead) days is then divided by 365 (or 366 for leap years) and then multiplied by the annual test year expenses to determine the amount of working capital required. The resulting amount of working capital is then included in Kingston Hydro's rate base for the purpose of deriving revenue requirements.

Key Concepts

Two key concepts need to be defined as they appear throughout the report:

Mid-Point Method

When a service is provided to (or by) Kingston Hydro over a period of time, the service is deemed to have been provided (or received) evenly over the midpoint of the period, unless specific information regarding the provision (or receipt) of that service indicates otherwise. If both the service end date ("Y") and the service start date ("X") are known, the mid-point of a service period can be calculated using the formula:

$$\text{Mid-Point} = \frac{([Y-X]+1)}{2}$$

When specific start and end dates are unknown, but it is known that a service is evenly distributed over the mid-point of a period, an alternative formula that is generally used is shown below. The formula uses the number of days in a year (A) and the number of periods in a year (B):

$$\text{Mid-Point} = \frac{A/B}{2}$$

Statutory Approach

In conjunction with the mid-point method, it is important to note that not all areas of the study may utilize dates on which actual payments were made to (or by) Kingston Hydro. In some instances, particularly for the HST, the due dates for payments are established by statute or by regulation with significant penalties for late payments. In these instances, the due date established by statute has been used in lieu of when payments were actually made.

Expense Lead Components

As used in the study, Expense Leads are defined to consist of two components:

² A positive lag (or lead) indicates that payments are received (or paid for) after the provision of a good or service.

³ The notion of dollar-weighting is pursued further in the sub-section titled "Key Concepts".

1. Service Lead component (services are assumed to be provided to Kingston Hydro evenly around the mid-point of the service period), and
2. Payment Lead component (the time period from the end of the service period to the time payment was made and when funds have left Kingston Hydro's possession).

Dollar Weighting

Both leads and lags should be dollar-weighted where appropriate and where data is available to accurately reflect the flow of dollars. For example, suppose that a particular transaction has a lead time of 100 days and has a dollar value of \$100. Further, suppose that another transaction has a lead time of 30 days with a dollar value of \$1 Million. A simple un-weighted average of the two transactions would give us a lead time of 65 days $([100+30]/2)$. However, when these two transactions are dollar weighted, the resulting lead time would be closer to 30 days which is more representative of how the dollars actually flow.

Methodology

Performing a lead-lag study requires two key undertakings:

1. Developing an understanding of how the regulated distribution business operates in terms of products and services sold to customers/purchased from vendors, and the policies and procedures that govern such transactions; and,
2. Modeling such operations using data from a relevant period of time and a representative data set. It is important to ascertain and factor into the study whether (or not) there are known changes to existing business policies and procedures going forward. Where such changes are known and material, they should be factored into the study.

To develop an understanding of Kingston Hydro's operations, interviews with Kingston Hydro's Accounts Payable, Customer Service, Wholesale Market Operations, Human Resources, Payroll, Treasury, and Tax Departments were conducted. Key questions that were addressed during the course of the interviews included:

1. What is being sold (or purchased)? If a service is being provided to (or by) Kingston Hydro, over what time period was this service provided;
2. Who are the buyers (or sellers);
3. What are the terms for payment? Are the terms for payment driven by industry norms or by company policy? Is there flexibility in the terms for payment;
4. Are any changes to the terms for payment expected? Are these terms driven by industry or internally? What is the basis for any such changes;
5. Are there any new rules or regulations governing transactions relating to distribution operations that are expected to materialize over the time frame considered in this report; and,
6. How are payments made (or received)? Payment types have different payment lead times (i.e., internet payments have shorter deposit times than cheque deposit times)

Appendix B: Detailed Data Tables

Other Revenues

Table 25: Summary of Other Revenues

Description	Amounts	Revenue Lag Time	Weighting Factor %	Weighted Lag Time
Interest on Interfund Balance	\$ 63,746	45.61	14.21%	6.48
Interest Revenue	\$ 3,270	15.23	0.73%	0.11
Miscellaneous	\$ 46,271	18.14	10.31%	1.87
Pole Rental	\$ 163,504	179.90	36.44%	65.56
Retail Service Charges	\$ 150,929	58.79	33.64%	19.78
Lines & Maintenance Fees	\$ 20,928	15.34	4.66%	0.72
Total	\$ 448,647		100.00%	94.52

Payroll (Union)

Table 26: Summary of Payroll Expenses

Delivery Period (Pay Period)	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
12/13/2013 to 12/26/2013	1/2/2014	\$ 56,377	7.00	7.00	14.00	3.94%	0.55
12/27/2013 to 01/09/2014	1/16/2014	\$ 62,731	7.00	7.00	14.00	4.39%	0.61
01/10/2014 to 01/23/2014	1/30/2014	\$ 50,570	7.00	7.00	14.00	3.54%	0.50
01/24/2014 to 02/06/2014	2/13/2014	\$ 48,517	7.00	7.00	14.00	3.39%	0.48
02/07/2014 to 02/20/2014	2/27/2014	\$ 50,239	7.00	7.00	14.00	3.51%	0.49
02/21/2014 to 03/06/2014	3/13/2014	\$ 49,111	7.00	7.00	14.00	3.44%	0.48
03/07/2014 to 03/20/2014	3/27/2014	\$ 47,622	7.00	7.00	14.00	3.33%	0.47
03/21/2014 to 04/03/2014	4/10/2014	\$ 53,234	7.00	7.00	14.00	3.72%	0.52
04/04/2014 to 04/17/2014	4/24/2014	\$ 50,312	7.00	7.00	14.00	3.52%	0.49
04/18/2014 to 05/01/2014	5/8/2014	\$ 50,799	7.00	7.00	14.00	3.55%	0.50
05/02/2014 to 05/15/2014	5/22/2014	\$ 50,474	7.00	7.00	14.00	3.53%	0.49
05/16/2014 to 05/29/2014	6/5/2014	\$ 53,847	7.00	7.00	14.00	3.77%	0.53
05/30/2014 to 06/12/2014	6/19/2014	\$ 52,559	7.00	7.00	14.00	3.68%	0.51

Delivery Period (Pay Period)	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighti ng Factor %	Weighte d Lead Time
06/13/2014 to 06/26/2014	7/3/2014	\$ 52,693	7.00	7.00	14.00	3.69%	0.52
06/27/2014 to 07/10/2014	7/17/2014	\$ 52,729	7.00	7.00	14.00	3.69%	0.52
07/11/2014 to 07/24/2014	7/31/2014	\$ 53,495	7.00	7.00	14.00	3.74%	0.52
07/25/2014 to 08/07/2014	8/14/2014	\$ 53,723	7.00	7.00	14.00	3.76%	0.53
08/08/2014 to 08/21/2014	8/28/2014	\$ 54,143	7.00	7.00	14.00	3.79%	0.53
08/22/2014 to 09/04/2014	9/11/2014	\$ 54,862	7.00	7.00	14.00	3.84%	0.54
09/05/2014 to 09/18/2014	9/25/2014	\$ 52,730	7.00	7.00	14.00	3.69%	0.52
09/19/2014 to 10/02/2014	10/9/2014	\$ 53,182	7.00	7.00	14.00	3.72%	0.52
10/03/2014 to 10/16/2014	10/23/2014	\$ 53,037	7.00	7.00	14.00	3.71%	0.52
10/17/2014 to 10/30/2014	11/6/2014	\$ 53,986	7.00	7.00	14.00	3.78%	0.53
10/31/2014 to 11/13/2014	11/20/2014	\$ 54,474	7.00	7.00	14.00	3.81%	0.53
11/14/2014 to 11/27/2014	12/4/2014	\$ 54,999	7.00	7.00	14.00	3.85%	0.54
11/28/2014 to 12/11/2014	12/18/2014	\$ 56,029	7.00	7.00	14.00	3.92%	0.55
12/12/2014 to 12/25/2014	12/31/2014	\$ 52,923	7.00	6.00	13.00	3.70%	0.48
Total		\$ 1,429,397				100.00%	13.96

Withholdings (Union)

Table 27: Summary of Withholdings Expenses

Delivery Period (Pay Period)	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighti ng Factor %	Weighte d Lead Time
12/13/2013 to 12/26/2013	1/10/2014	\$ 25,629	7.00	15.00	22.00	5.02%	1.10
12/27/2013 to 01/09/2014	1/24/2014	\$ 31,417	7.00	15.00	22.00	6.15%	1.35
01/10/2014 to 01/23/2014	2/5/2014	\$ 19,832	7.00	13.00	20.00	3.88%	0.78
01/24/2014 to 02/06/2014	2/19/2014	\$ 18,729	7.00	13.00	20.00	3.67%	0.73
02/07/2014 to 02/20/2014	3/5/2014	\$ 20,142	7.00	13.00	20.00	3.94%	0.79
02/21/2014 to 03/06/2014	3/19/2014	\$ 19,159	7.00	13.00	20.00	3.75%	0.75

Delivery Period (Pay Period)	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighti ng Factor %	Weighte d Lead Time
03/07/2014 to 03/20/2014	4/3/2014	\$ 19,333	7.00	14.00	21.00	3.79%	0.79
03/21/2014 to 04/03/2014	4/17/2014	\$ 21,949	7.00	14.00	21.00	4.30%	0.90
04/04/2014 to 04/17/2014	5/5/2014	\$ 20,431	7.00	18.00	25.00	4.00%	1.00
04/18/2014 to 05/01/2014	5/20/2014	\$ 19,980	7.00	19.00	26.00	3.91%	1.02
05/02/2014 to 05/15/2014	6/4/2014	\$ 20,192	7.00	20.00	27.00	3.95%	1.07
05/16/2014 to 05/29/2014	6/11/2014	\$ 20,808	7.00	13.00	20.00	4.07%	0.81
05/30/2014 to 06/12/2014	6/25/2014	\$ 19,370	7.00	13.00	20.00	3.79%	0.76
06/13/2014 to 06/26/2014	7/17/2014	\$ 19,842	7.00	21.00	28.00	3.89%	1.09
06/27/2014 to 07/10/2014	7/24/2014	\$ 19,079	7.00	14.00	21.00	3.74%	0.78
07/11/2014 to 07/24/2014	8/6/2014	\$ 19,394	7.00	13.00	20.00	3.80%	0.76
07/25/2014 to 08/07/2014	8/19/2014	\$ 18,173	7.00	12.00	19.00	3.56%	0.68
08/08/2014 to 08/21/2014	9/4/2014	\$ 17,771	7.00	14.00	21.00	3.48%	0.73
08/22/2014 to 09/04/2014	9/17/2014	\$ 17,053	7.00	13.00	20.00	3.34%	0.67
09/05/2014 to 09/18/2014	10/3/2014	\$ 16,161	7.00	15.00	22.00	3.16%	0.70
09/19/2014 to 10/02/2014	10/17/2014	\$ 15,404	7.00	15.00	22.00	3.02%	0.66
10/03/2014 to 10/16/2014	11/5/2014	\$ 15,475	7.00	20.00	27.00	3.03%	0.82
10/17/2014 to 10/30/2014	11/13/2014	\$ 15,000	7.00	14.00	21.00	2.94%	0.62
10/31/2014 to 11/13/2014	11/26/2014	\$ 14,785	7.00	13.00	20.00	2.90%	0.58
11/14/2014 to 11/27/2014	12/10/2014	\$ 15,599	7.00	13.00	20.00	3.05%	0.61
11/28/2014 to 12/11/2014	12/24/2014	\$ 15,649	7.00	13.00	20.00	3.06%	0.61
12/12/2014 to 12/25/2014	1/6/2015	\$ 14,336	7.00	12.00	19.00	2.81%	0.53
Total		\$ 510,692				100.00%	21.70

Payroll (Non-Union)

Table 28: Summary of Payroll Expenses

Delivery Period (Pay Period)	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighti ng Factor %	Weighte d Lead Time
12/20/2013 to 01/02/2014	1/9/2014	\$ 20,485	7.00	7.00	14.00	3.59%	0.50
01/03/2014 to 01/16/2014	1/23/2014	\$ 20,490	7.00	7.00	14.00	3.59%	0.50
01/17/2014 to 01/30/2014	2/6/2014	\$ 20,517	7.00	7.00	14.00	3.59%	0.50
01/31/2014 to 02/13/2014	2/20/2014	\$ 20,764	7.00	7.00	14.00	3.63%	0.51
02/14/2014 to 02/27/2014	3/6/2014	\$ 20,510	7.00	7.00	14.00	3.59%	0.50
02/28/2014 to 03/13/2014	3/20/2014	\$ 21,370	7.00	7.00	14.00	3.74%	0.52
03/14/2014 to 03/27/2014	4/3/2014	\$ 24,426	7.00	7.00	14.00	4.28%	0.60
03/28/2014 to 04/10/2014	4/17/2014	\$ 21,236	7.00	7.00	14.00	3.72%	0.52
04/11/2014 to 04/24/2014	5/1/2014	\$ 21,126	7.00	7.00	14.00	3.70%	0.52
04/25/2014 to 05/08/2014	5/15/2014	\$ 21,639	7.00	7.00	14.00	3.79%	0.53
05/09/2014 to 05/22/2014	5/29/2014	\$ 21,518	7.00	7.00	14.00	3.77%	0.53
05/23/2014 to 06/05/2014	6/12/2014	\$ 21,650	7.00	7.00	14.00	3.79%	0.53
06/06/2014 to 06/19/2014	6/26/2014	\$ 22,057	7.00	7.00	14.00	3.86%	0.54
06/20/2014 to 07/03/2014	7/10/2014	\$ 22,442	7.00	7.00	14.00	3.93%	0.55
07/04/2014 to 07/17/2014	7/24/2014	\$ 21,886	7.00	7.00	14.00	3.83%	0.54
07/18/2014 to 07/31/2014	8/7/2014	\$ 22,445	7.00	7.00	14.00	3.93%	0.55
08/01/2014 to 08/14/2014	8/21/2014	\$ 22,520	7.00	7.00	14.00	3.94%	0.55
08/15/2014 to 08/28/2014	9/4/2014	\$ 22,095	7.00	7.00	14.00	3.87%	0.54
08/29/2014 to 09/11/2014	9/18/2014	\$ 22,519	7.00	7.00	14.00	3.94%	0.55
09/12/2014 to 09/25/2014	10/2/2014	\$ 22,578	7.00	7.00	14.00	3.95%	0.55
09/26/2014 to 10/09/2014	10/16/2014	\$ 22,676	7.00	7.00	14.00	3.97%	0.56
10/10/2014 to 10/23/2014	10/30/2014	\$ 22,373	7.00	7.00	14.00	3.92%	0.55
10/24/2014 to 11/06/2014	11/13/2014	\$ 23,061	7.00	7.00	14.00	4.04%	0.57
11/07/2014 to 11/20/2014	11/27/2014	\$ 22,770	7.00	7.00	14.00	3.99%	0.56

Delivery Period (Pay Period)	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighti ng Factor %	Weighte d Lead Time
11/21/2014 to 12/04/2014	12/11/2014	\$ 23,187	7.00	7.00	14.00	4.06%	0.57
12/05/2014 to 12/18/2014	12/24/2014	\$ 22,955	7.00	6.00	13.00	4.02%	0.52
Total		\$ 571,296				100.00%	13.96

Withholdings (Non-Union)

Table 29: Summary of Withholdings Expenses

Delivery Period (Pay Period)	Payment Date	Amounts	Service Lead Time	Paymen t Lead Time	Total Lead Time	Weighti ng Factor %	Weight ed Lead Time
12/13/2013 to 12/26/2013	1/17/2014	\$ 8,946	7.00	15.00	22.00	4.06%	0.89
12/27/2013 to 01/09/2014	2/5/2014	\$ 9,168	7.00	20.00	27.00	4.16%	1.12
01/10/2014 to 01/23/2014	2/12/2014	\$ 8,897	7.00	13.00	20.00	4.03%	0.81
01/24/2014 to 02/06/2014	2/26/2014	\$ 9,259	7.00	13.00	20.00	4.20%	0.84
02/07/2014 to 02/20/2014	3/12/2014	\$ 9,145	7.00	13.00	20.00	4.15%	0.83
02/21/2014 to 03/06/2014	3/26/2014	\$ 9,396	7.00	13.00	20.00	4.26%	0.85
03/07/2014 to 03/20/2014	4/10/2014	\$ 13,220	7.00	14.00	21.00	6.00%	1.26
03/21/2014 to 04/03/2014	4/24/2014	\$ 9,215	7.00	14.00	21.00	4.18%	0.88
04/04/2014 to 04/17/2014	5/12/2014	\$ 9,457	7.00	18.00	25.00	4.29%	1.07
04/18/2014 to 05/01/2014	5/20/2014	\$ 9,101	7.00	12.00	19.00	4.13%	0.78
05/02/2014 to 05/15/2014	6/4/2014	\$ 9,122	7.00	13.00	20.00	4.14%	0.83
05/16/2014 to 05/29/2014	6/18/2014	\$ 8,651	7.00	13.00	20.00	3.92%	0.78
05/30/2014 to 06/12/2014	7/4/2014	\$ 8,777	7.00	15.00	22.00	3.98%	0.88
06/13/2014 to 06/26/2014	7/17/2014	\$ 8,269	7.00	14.00	21.00	3.75%	0.79
06/27/2014 to 07/10/2014	8/7/2014	\$ 8,046	7.00	21.00	28.00	3.65%	1.02
07/11/2014 to 07/24/2014	8/12/2014	\$ 7,685	7.00	12.00	19.00	3.49%	0.66
07/25/2014 to 08/07/2014	8/26/2014	\$ 7,794	7.00	12.00	19.00	3.53%	0.67
08/08/2014 to 08/21/2014	9/10/2014	\$ 7,484	7.00	13.00	20.00	3.39%	0.68

Delivery Period (Pay Period)	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
08/22/2014 to 09/04/2014	9/24/2014	\$ 7,271	7.00	13.00	20.00	3.30%	0.66
09/05/2014 to 09/18/2014	10/10/2014	\$ 7,407	7.00	15.00	22.00	3.36%	0.74
09/19/2014 to 10/02/2014	10/24/2014	\$ 7,199	7.00	15.00	22.00	3.26%	0.72
10/03/2014 to 10/16/2014	11/5/2014	\$ 7,271	7.00	13.00	20.00	3.30%	0.66
10/17/2014 to 10/30/2014	11/19/2014	\$ 7,356	7.00	13.00	20.00	3.34%	0.67
10/31/2014 to 11/13/2014	12/3/2014	\$ 7,466	7.00	13.00	20.00	3.39%	0.68
11/14/2014 to 11/27/2014	12/17/2014	\$ 7,340	7.00	13.00	20.00	3.33%	0.67
11/28/2014 to 12/11/2014	1/6/2015	\$ 7,554	7.00	19.00	26.00	3.43%	0.89
12/12/2014 to 12/25/2014	1/17/2015	\$ 8,946	7.00	15.00	22.00	4.06%	0.89
Total		\$ 220,495				100.00%	21.32

Pensions

Table 30: Summary of Pension Expenses

Delivery Period	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	2/25/2014	\$ 66,738	15.50	25.00	40.50	11.11%	4.50
Feb-14	3/25/2014	\$ 44,083	14.00	25.00	39.00	7.34%	2.86
Mar-14	4/29/2014	\$ 47,072	15.50	29.00	44.50	7.84%	3.49
Apr-14	5/27/2014	\$ 61,594	15.00	27.00	42.00	10.25%	4.31
May-14	6/24/2014	\$ 44,980	15.50	24.00	39.50	7.49%	2.96
Jun-14	7/29/2014	\$ 44,983	15.00	29.00	44.00	7.49%	3.29
Jul-14	8/26/2014	\$ 51,762	15.50	26.00	41.50	8.62%	3.58
Aug-14	9/30/2014	\$ 44,711	15.50	30.00	45.50	7.44%	3.39
Sep-14	10/28/2014	\$ 59,668	15.00	28.00	43.00	9.93%	4.27
Oct-14	11/25/2014	\$ 44,704	15.50	25.00	40.50	7.44%	3.01
Nov-14	12/30/2014	\$ 45,063	15.00	30.00	45.00	7.50%	3.38
Dec-14	1/27/2015	\$ 45,359	15.50	27.00	42.50	7.55%	3.21
Total		\$ 600,718				100.00%	42.24

Group Medical and Dental

Table 31: Summary of Group Medical and Dental Expenses

Delivery Period	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	1/14/2014	\$ 12,752	15.50	(17.00)	(1.50)	7.95%	(0.12)
Feb-14	2/11/2014	\$ 13,246	14.00	(17.00)	(3.00)	8.26%	(0.25)
Mar-14	3/11/2014	\$ 13,053	15.50	(20.00)	(4.50)	8.14%	(0.37)
Apr-14	4/15/2014	\$ 13,072	15.00	(15.00)	-	8.15%	-
May-14	5/13/2014	\$ 13,941	15.50	(18.00)	(2.50)	8.69%	(0.22)
Jun-14	6/10/2014	\$ 13,464	15.00	(20.00)	(5.00)	8.40%	(0.42)
Jul-14	7/15/2014	\$ 13,647	15.50	(16.00)	(0.50)	8.51%	(0.04)
Aug-14	8/12/2014	\$ 13,361	15.50	(19.00)	(3.50)	8.33%	(0.29)
Sep-14	9/16/2014	\$ 13,473	15.00	(14.00)	1.00	8.40%	0.08
Oct-14	10/14/2014	\$ 13,498	15.50	(17.00)	(1.50)	8.42%	(0.13)
Nov-14	11/14/2014	\$ 13,394	15.00	(16.00)	(1.00)	8.35%	(0.08)
Dec-14	12/9/2014	\$ 13,455	15.50	(22.00)	(6.50)	8.39%	(0.55)
Total		\$ 160,356				100.00%	(2.38)

Group Life Insurance

Table 32: Summary of Group Life Insurance Expenses

Delivery Period	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	2/11/2014	\$ 1,758	15.50	11.00	26.50	8.04%	2.13
Feb-14	3/11/2014	\$ 1,760	14.00	11.00	25.00	8.05%	2.01
Mar-14	4/15/2014	\$ 1,782	15.50	15.00	30.50	8.15%	2.49
Apr-14	5/13/2014	\$ 2,227	15.00	13.00	28.00	10.19%	2.85
May-14	6/10/2014	\$ 1,800	15.50	10.00	25.50	8.23%	2.10
Jun-14	7/15/2014	\$ 2,007	15.00	15.00	30.00	9.18%	2.75
Jul-14	8/12/2014	\$ 1,752	15.50	12.00	27.50	8.01%	2.20
Aug-14	9/16/2014	\$ 1,859	15.50	16.00	31.50	8.50%	2.68
Sep-14	10/14/2014	\$ 1,826	15.00	14.00	29.00	8.35%	2.42
Oct-14	11/14/2014	\$ 1,719	15.50	14.00	29.50	7.86%	2.32
Nov-14	12/9/2014	\$ 1,713	15.00	9.00	24.00	7.84%	1.88
Dec-14	1/13/2015	\$ 1,661	15.50	13.00	28.50	7.60%	2.17
Total		\$ 21,864				100.00%	28.00

Long-term Disability

Table 33: Summary of Long-term Disability Expenses

Delivery Period	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	2/11/2014	\$ 2,543	15.50	11.00	26.50	7.65%	2.03
Feb-14	3/11/2014	\$ 2,581	14.00	11.00	25.00	7.76%	1.94
Mar-14	4/15/2014	\$ 2,579	15.50	15.00	30.50	7.76%	2.37
Apr-14	5/13/2014	\$ 3,773	15.00	13.00	28.00	11.35%	3.18
May-14	6/10/2014	\$ 2,668	15.50	10.00	25.50	8.03%	2.05
Jun-14	7/15/2014	\$ 3,207	15.00	15.00	30.00	9.65%	2.89
Jul-14	8/12/2014	\$ 2,738	15.50	12.00	27.50	8.24%	2.26
Aug-14	9/16/2014	\$ 2,642	15.50	16.00	31.50	7.95%	2.50
Sep-14	10/14/2014	\$ 2,694	15.00	14.00	29.00	8.10%	2.35
Oct-14	11/14/2014	\$ 2,520	15.50	14.00	29.50	7.58%	2.24
Nov-14	12/9/2014	\$ 2,645	15.00	9.00	24.00	7.96%	1.91
Dec-14	1/13/2015	\$ 2,656	15.50	13.00	28.50	7.99%	2.28
Total		\$ 33,244				100.00%	27.99

EHT

Table 34: Summary of EHT Expenses

Delivery Period	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	2/17/2014	\$ 6,652	15.50	17.00	32.50	10.97%	3.57
Feb-14	3/17/2014	\$ 4,334	14.00	17.00	31.00	7.15%	2.22
Mar-14	4/15/2014	\$ 4,371	15.50	15.00	30.50	7.21%	2.20
Apr-14	5/15/2014	\$ 4,793	15.00	15.00	30.00	7.91%	2.37
May-14	6/16/2014	\$ 5,240	15.50	16.00	31.50	8.64%	2.72
Jun-14	7/15/2014	\$ 4,577	15.00	15.00	30.00	7.55%	2.27
Jul-14	8/15/2014	\$ 6,178	15.50	15.00	30.50	10.19%	3.11
Aug-14	9/15/2014	\$ 4,521	15.50	15.00	30.50	7.46%	2.27
Sep-14	10/15/2014	\$ 4,460	15.00	15.00	30.00	7.36%	2.21
Oct-14	11/17/2014	\$ 5,060	15.50	17.00	32.50	8.35%	2.71
Nov-14	12/15/2014	\$ 4,388	15.00	15.00	30.00	7.24%	2.17
Dec-14	1/15/2015	\$ 6,041	15.50	15.00	30.50	9.97%	3.04
Total		\$ 60,615				100.00%	30.86

WSIB

Table 35: Summary of WSIB Expenses

Delivery Period	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	2/28/2014	\$ 3,511	15.50	28.00	43.50	11.06%	4.81
Feb-14	3/31/2014	\$ 2,293	14.00	31.00	45.00	7.22%	3.25
Mar-14	4/30/2014	\$ 2,278	15.50	30.00	45.50	7.18%	3.27
Apr-14	5/31/2014	\$ 2,500	15.00	31.00	46.00	7.88%	3.62
May-14	6/30/2014	\$ 2,734	15.50	30.00	45.50	8.61%	3.92
Jun-14	7/31/2014	\$ 2,400	15.00	31.00	46.00	7.56%	3.48
Jul-14	8/31/2014	\$ 3,226	15.50	31.00	46.50	10.17%	4.73
Aug-14	9/30/2014	\$ 2,365	15.50	30.00	45.50	7.45%	3.39
Sep-14	10/31/2014	\$ 2,332	15.00	31.00	46.00	7.35%	3.38
Oct-14	11/30/2014	\$ 2,646	15.50	30.00	45.50	8.34%	3.79
Nov-14	12/31/2014	\$ 2,302	15.00	31.00	46.00	7.25%	3.34
Dec-14	1/31/2015	\$ 3,153	15.50	31.00	46.50	9.93%	4.62
Total		\$ 31,741				100.00%	45.59

United Way

Table 36: Summary of United Way Expenses

Delivery Period	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	2/20/2014	\$ 365	15.50	20.00	35.50	12.82%	4.55
Feb-14	3/20/2014	\$ 291	14.00	20.00	34.00	10.21%	3.47
Mar-14	4/17/2014	\$ 253	15.50	17.00	32.50	8.90%	2.89
Apr-14	5/15/2014	\$ 265	15.00	15.00	30.00	9.28%	2.79
May-14	6/12/2014	\$ 282	15.50	12.00	27.50	9.89%	2.72
Jun-14	7/17/2014	\$ 205	15.00	17.00	32.00	7.20%	2.30
Jul-14	8/21/2014	\$ 233	15.50	21.00	36.50	8.19%	2.99
Aug-14	9/11/2014	\$ 185	15.50	11.00	26.50	6.51%	1.73
Sep-14	10/9/2014	\$ 185	15.00	9.00	24.00	6.48%	1.56
Oct-14	11/13/2014	\$ 225	15.50	13.00	28.50	7.89%	2.25
Nov-14	12/18/2014	\$ 181	15.00	18.00	33.00	6.36%	2.10
Dec-14	1/8/2015	\$ 179	15.50	8.00	23.50	6.28%	1.48
Total		\$ 2,849				100.00%	30.81

Social Club

Table 37: Summary of Social Club Expenses

Delivery Period	Payment Date	Amounts	Service Lead Time	Payment Lead Time	Total Lead Time	Weighting Factor %	Weighted Lead Time
Jan-14	2/20/2014	\$ 94	15.50	20.00	35.50	8.51%	3.02
Feb-14	3/20/2014	\$ 91	14.00	20.00	34.00	8.28%	2.81
Mar-14	4/17/2014	\$ 88	15.50	17.00	32.50	7.97%	2.59
Apr-14	5/15/2014	\$ 89	15.00	15.00	30.00	8.12%	2.44
May-14	6/12/2014	\$ 88	15.50	12.00	27.50	7.97%	2.19
Jun-14	7/17/2014	\$ 88	15.00	17.00	32.00	7.97%	2.55
Jul-14	8/21/2014	\$ 88	15.50	21.00	36.50	8.04%	2.94
Aug-14	9/11/2014	\$ 98	15.50	11.00	26.50	8.89%	2.36
Sep-14	10/9/2014	\$ 88	15.00	9.00	24.00	7.97%	1.91
Oct-14	11/13/2014	\$ 88	15.50	13.00	28.50	7.97%	2.27
Nov-14	12/18/2014	\$ 95	15.00	18.00	33.00	8.66%	2.86
Dec-14	1/8/2015	\$ 106	15.50	8.00	23.50	9.67%	2.27
Total		\$ 1,099				100.00%	30.20

Appendix C: Expert Information

Ralph Zarumba, Director in the Energy Practice at Navigant Consulting, specializes in Regulatory Matters. Mr. Zarumba oversees that part of Navigant's Energy Practices specializing in retail regulatory matters. Mr. Zarumba has appeared as an expert in several dozen regulatory proceedings in Canada and the United States.

Business address: 30 South Wacker Drive, Suite 3100, Chicago, IL 60606

Navigant has previously undertaken or supported numerous lead-lag studies across North America and for several of Ontario's electricity local distribution companies (LDCs) including Hydro One, Toronto Hydro, Horizon Utilities, Hydro Ottawa, London Hydro and others. Navigant lead-lag reports have been submitted by many of these other clients as evidence to support their rate submissions, and our approach and findings have been accepted, in large part, by the OEB and interveners. Some examples of recent lead-lag studies conducted by Navigant where Mr. Zarumba was the projected manager which have been filed with the OEB by Ontario utilities are outlined below.

Table 38: Recent Navigant Lead-Lag Studies (Ontario)

Utility	Reference
Toronto Hydro-Electric System Limited	EB-2014-0116 Exhibit 2A, Tab 3, Schedule 2
Hydro One Networks Inc. (distribution)	EB-2013-0141 Exhibit D1, Tab 1, Schedule 3
Hydro One Networks Inc. (transmission)	EB-2012-0031 Exhibit D1, Tab 1, Schedule 3, Attachment 1
Horizon Utilities	EB-2014-0002 Exhibit 2, Tab 4, Schedule 1
North Bay Hydro	EB-2014-0099, Correspondence
Entegrus Powerlines Inc.	EB-2015-0061, Exhibit 2, Attachment 2-B

Ralph Zarumba

Ralph Zarumba
Director

Navigant Consulting, Inc.
30 S. Wacker Drive
Suite 3100
Chicago, IL 60606
Cell: 312.342.4387
Fax: 312.583.5701
Skype: ralph.zarumba

ralph.zarumba@navigant.com

Professional History

- Director, Navigant Consulting
- Director, Science Applications International Corporation
- President, Zarumba Consulting
- Management Consultant, Sargent & Lundy Consulting Group
- President, Analytical Support Network, Inc.
- Manager, Pricing Practice, Synergic Resources Corporation
- Senior Analyst – San Diego Gas & Electric Company
- Senior Analyst – Wisconsin Electric Power Company
- Analyst 4 – Eastern Utilities Associates
- Analyst – Illinois Power Company

Education

- MA, Economics, DePaul University, Chicago, IL
- BS, Economics, Illinois State University, Normal, IL

Ralph Zarumba is a Director in the Energy Practice with 30 years of experience specializing in regulatory issues and economic analysis associated with energy utilities in North America, Europe and Asia. Mr. Zarumba has appeared as an expert witness in a number of regulatory and legal proceedings addressing electric generation, transmission and distribution issues, unregulated operations of utility holding companies, asset valuation and regulatory treatment of Smart Grid investments. He has also assisted clients in other matters including Depreciation Studies, Transfer Pricing Mechanisms and evaluation of the results of competitive bidding for electric generation services. These testimonies have been presented before the Nova Scotia Utility and Review Board, the Federal Energy Regulatory Commission (“FERC”), the Massachusetts Department of Public Utilities, the Rhode Island Public Utilities Commission, the Illinois Commerce Commission, the Wisconsin Public Service Commission, the Ontario Energy Board, the New York Public Service Commission, the New Mexico Public Regulation Commission, the Kansas Corporation Commission as well as a number of other venues. Mr. Zarumba has provided a number of papers and presentations on various regulatory and market analysis issues.

Recent Whitepapers

- » White Paper Prepared for the Ontario Energy Board on Approaches to Rate Mitigation for Transmitters and Distributors

http://www.ontarioenergyboard.ca/OEB/_Documents/EB-2010-0378/EB-2010-0378_Navigant_Report.pdf

- » White Paper Prepared for the Ontario Energy Board Cost addressing Distributor Efficiency

http://www.ontarioenergyboard.ca/OEB/_Documents/EB-2012-0397/Navigant_Report_Elect-Dist-Efficiency_20130225.pdf

- » White Paper Prepared for the Ontario Energy Board Cost addressing Cost Assessment Models for Regulators

http://www.rds.ontarioenergyboard.ca/webdrawer/webdrawer.dll/webdrawer/rec/319593/view/Cost%20Assessment%20Model%20Report_Jan%2013%202011_20120116pdf.PDF

- » Economic Issues Related to Tariff Development (with Thomas Welch)

<http://www.erranet.org/index.php?name=OE-eLibrary&file=download&id=6052&keret=N&showheader=N>

Recent Publications

Public Utilities Fortnightly “Pricing Social Benefits - Calculating and allocating costs for non-traditional utility services” Ralph Zarumba, Benjamin Grunfeld and Koby Bailey, August 2013

American Gas “Modernization: The Quest for 21st Century Utilities” Ralph Zarumba and Peter Haapaniemi, November 2012

Public Utilities Fortnightly “Pre-Funding to Mitigate Rate Shock” Sherman Elliot and Ralph Zarumba, September 2012

Cost of Service

- » Provided testimony in the proceedings reviewing the 2014 Nova Scotia Power Cost-of-Service study (NSPI-P-892-/M05473).
- » Prepared and sponsored before the FERC a cost-of-service filing supporting a Reliability Must-Run filing on the Cayuga Operating Company.
- » Managed a project team which completed a Remaining Life Study for the Western Minnesota Municipal Power Agency.
- » For a confidential client reviewed the cost-of-service application for a natural gas distributor in Central Canada.

Regulatory and Pricing

- » Assisted the Ontario Energy in formulating a regulatory process and pricing design for Revenue Decoupling.
- » Prepared a white paper on rate mitigation mechanisms for the Ontario Energy Board.
- » Prepared a white paper for the Ontario Energy Board on apportion of regulatory commission costs to various stakeholders.
- » Prepared a number of working capital studies for various distributors and transmitters in the Province of Ontario.
- » Prepare a functional cost separation study for a regulated electric utility in Ontario.
- » For a confidential client prepared a benchmarking analysis of the costs of regulatory proceedings associated with the introduction of new electric generation.
- » Prepared an analysis of the pricing of voluntary renewable energy products for a Midwestern public power association.
- » Led a team that prepared a cost of service, rate design, legal evaluation and financial analysis for the Puerto Rico Electric Power Authority.
- » Performed a Pricing Strategy for the South Carolina Public Service Company (Santee Cooper).
- » Prepared a financial plan, electric rate design and phase-in plan for a new electric generation plan for Fayetteville (North Carolina) Public Works Commission.
- » Assisted Commonwealth Edison Company in their Electric Rate Request (Illinois Commerce Commission Docket No. 10-467).
- » Prepared proposals for Retail Conjunctive Billing Pricing filed in Illinois and Wisconsin which were filed before the Illinois Commerce Commission and the Wisconsin Public Service Commission.

- » Developed the Wisconsin Electric Power Company's first Curtailable Electric Tariff available to commercial customers.
- » Negotiated complex service contracts with thermal energy customers which led to a major expansion of the Wisconsin Electric Steam System.
- » Assisted Indianapolis Power & Light in preparing a cost recovery plan for Energy Efficiency and Demand Side Management Expenditures.
- » Trained regulatory staffs in the Republic of Macedonia, Bosnia and Herzegovina, Croatia and Albania.
- » Prepared proposals for ancillary services pricing based upon market-based mechanisms for San Diego Gas and Electric Company.
- » Completed the development of wholesale and retail rate designs for a southeastern G&T, an analysis of stranded cost exposure for a northeastern utility, and prepared a strategic plan for a large municipal utility.
- » Developed a proposal for electric generation transfer pricing that would be used as a transition mechanism between the existing vertically integrated utility and a deregulated environment.
- » Filed testimony in Wisconsin proposing that state's first Demand Response Program.

Demand Response

- » Assisted the Building Owners and Managers of Chicago (BOMA/Chicago) develop a program where they can bid demand response based ancillary services into the PJM market.
- » Prepared a presentation for the Public Utilities Commission of Ohio on Commercial and Industrial Dynamic Pricing and Demand Response in an unregulated regulatory environment.

Electric Transmission

- » Assisted the Long Island Power Authority to purchase distribution, transmission and regulatory assets and prepared its non-jurisdictional open-access transmission tariff.
- » Prepared the pricing portion of a FERC open access tariff (Docket No. ER96-96-43.000) for San Diego Gas and Electric Company; testified on revenue requirements and pricing including opportunity costs.

Generation Market Analysis

- » For a major public power generation owner prepared a strategy of internal coal versus natural gas generation dispatch protocols including the treatment of liquidated damages.
- » Co-authored a report for Nalcor on the feasibility and economics of the proposed development of the Lower Churchill Hydroelectric project.

- » Prepared a number of electric market price forecasts for many regions of the United States and Central America.
- » Supported the electric pricing and infrastructure analysis for a Least-Cost Resource Plan for San Diego County.
- » Prepared an analysis of the saturation of coal-fired electric generation technology in the Western Electric Coordinating Council.
- » Developed a long-run electric expansion plan for the Railbelt System in Alaska.
- » Managed a team that prepared a long-term capacity and energy forecast for a medium-sized municipal utility.
- » For Manitowoc Public Utilities prepared a resource plan evaluating various generation expansion options.

Merger, Acquisition and Divestiture

- » On behalf of the Minnesota Public Service Commission, Mr. Zarumba co-authored an analysis of the merger savings associated with the proposed Primergy Merger (the proposed combination of Northern States Power and Wisconsin Energy). The analysis included a detailed review of cost savings that would emanate from the merger and regulatory commitments made by the companies to regulatory authorities in Minnesota.
- » The Ontario Energy Board desired to identify factors that potentially impede the combination of regulated distributors in that province. Mr. Zarumba co-authored a study which identified those factors and discussed policies in other jurisdictions.
- » For the Manitowoc Public Utilities prepared an analysis that evaluated the divestiture of its transmission assets to the American Transmission Company.
- » For a confidential client prepared a valuation to support a proposed acquisition of a Midwestern Electric and Natural Gas utility by a regional utility. The analysis included an analysis of a sale of the electric operations of the target utility to another regulated utility.

International

- » Currently assisting the Israel Public Utility Authority is electric tariff reviews for the Israel Electric Company and the Jerusalem District Electric Company.
- » Mr. Zarumba assisted the electric regulator in the Republic of Macedonia with various regulatory issues including pricing design, revenue requirements and privatization issues. Included in the assistance was the development of market designs for the electricity sector.
- » Completed a tariff implementation plan proposal for the privatization of the distribution companies of the Bulgarian Electric Utility.

- » Led a team to implement regulatory procedures and methodology for the electric power industry in Bosnia and Herzegovina.
- » Conducted a study of the electric power market in El Salvador including a quantification of the level of generation market power using the Lerner Index.

FORM A

Proceeding: EB-2015-0083

ACKNOWLEDGMENT OF EXPERT'S DUTY

1. My name is ...Ralph Zarumba.....(*name*). I live at ...736 Central... (*city*), in the ...Evanston..... (*province/state*) of ...Illinois..... .
2. I have been engaged by or on behalf of ...Kingston Hydro..... (*name of party/parties*) to provide evidence in relation to the above-noted proceeding before the Ontario Energy Board.
3. I acknowledge that it is my duty to provide evidence in relation to this proceeding as follows:
 - (a) to provide opinion evidence that is fair, objective and non-partisan;
 - (b) to provide opinion evidence that is related only to matters that are within my area of expertise; and
 - (c) to provide such additional assistance as the Board may reasonably require, to determine a matter in issue.
4. I acknowledge that the duty referred to above prevails over any obligation which I may owe to any party by whom or on whose behalf I am engaged.

Date ..September 29, 2015.....



Signature