EXHIBIT 1 – ADMINISTRATION

<u>Interrogatory 1-Staff-1</u>

Updated Revenue Requirement Work Form (RRWF) and Models

Upon completing all interrogatories from OEB staff and intervenors, please provide an updated RRWF in working Microsoft Excel format with any corrections or adjustments that the Applicant wishes to make to the amounts in the populated version of the RRWF filed in the initial applications. Entries for changes and adjustments should be included in the middle column on sheet 3 Data_Input_Sheet. Sheets 10 (Load Forecast), 11 (Cost Allocation), and 13 (Rate Design) should be updated, as necessary. Please include documentation of the corrections and adjustments, such as a reference to an interrogatory response or an explanatory note. Such notes should be documented on Sheet 14 Tracking Sheet and may also be included on other sheets in the RRWF to assist understanding of changes.

In addition, please file an updated set of models that reflects the interrogatory responses. Please ensure the models used are the latest available models on the OEB's 2023 Electricity Distributor Rate Applications webpage.

Note that the 2023 PILs Workform has been updated to reflect the change in small business rate from the 2022 federal budget that updated the range over which the small business deduction is reduced to $10 million to $15 million.

Please note that the 2023 RTSR Workform has been updated with the 2022 UTRs,

and 2021 billed usage from the RRRs. Please ensure that 2021 wholesale volumes are also used.

Response

The following models have been updated and are filed with interrogatory responses:

- Revenue Requirement Workform (RRWF)
- Chapter 2 Appendices Model
- Cost Allocation Model
- DVA Continuity Schedule
- PILs Model
- LRAMVA Workform
- Tariff Schedule and Bill Impact Model

Following the reduction in the Street Lighting Group 2 Rate Rider (9-Staff-80), the class no longer requires rate mitigation.

Table 1 Summary COS Model Updates

IR Response	**Update**	**Models Updated**
2-Staff-11	Updated to reflect capital expenditures as required	Ch 2 Appendix App.2-AB.
4-SEC-20	3 columns year to date actuals for 2022, and then year to date actuals for 2020 and 2021	Ch 2 Appendix App.2-JD.
5-Staff-65	Debt rate adjustment but no PILs adjustment	Ch 2 Appendix App.2-OB. Debt Instruments, PILs model, RRWF
Error Checking Q6	Accounts 1588 and 1589 amounts for the year 2020 have been revised to match those in the 2022 IRM DVA Continuity Schedule	DVA Continuity Tab 2a.
Error Checking Q7	Account 1595 sub-account for years prior to 2017 was amended to allow for insertion of two lines for Account 1595 (2015) and Account 1595 (2016)	DVA Continuity Tab 2a.
Error Checking Q10	For residual balances in Account 1595 Sub-account for 2014, 2015, 2016 and 2017, column BU pf Tab 2a revised to state "No" rather than "Yes" regarding the disposition of these sub-accounts.	DVA Continuity Tab 2a.
Error Checking Q12	Account 1592 sub-account CCA Changes principal balances for 2019 and 2020 revised to reconcile	DVA Continuity Tab 2b.

	to Exhibit 9 Table 3 and Attachments 2 and 3.	
1-Staff-1	Update Projected Interest for 2022 to reflect Q3 OEB Prescribed Interest for remainder of 2022	DVA Continuity Tab 2a and 2b.
6-Staff-67	Account 1592 sub-account CCA Changes - add estimate for 2022 - credit $135,675	DVA Continuity Tab 2b.
7-Staff-70	Update to customer numbers in the derivation of the Billing and Collecting weighting factor	Cost Allocation Model, Billing and Collecting Weighting Factor
9-Staff-75	Account 1508 Sub-Account Revenue Requirement Differential Variance Account related to Capital Additions - add transaction for 2021 - credit $23,720	DVA Continuity Tab 2b.
9-Staff-75	Account 1508 Sub-Account OPEB Forecast Cash vs. Forecast Accrual Differential Deferral Account - add transactions for 2021 - debit $22,226	DVA Continuity Tab 2b.
9-Staff-76	Account 1508 Sub-Account Specific Service Charge Variance Account - add estimate for 2022 - credit $97,332	DVA Continuity Tab 2b.

9-Staff-76	Account 1508 Sub-Account Revenue Requirement Differential Variance Account related to Capital Additions - add estimate for 2022 - credit $29,342 Combined with response to 9-Staff-78, net principal adjustment in cell BF55 is $43,463	DVA Continuity Tab 2b.
9-Staff-76	Account 1508 Sub-Account OPEB Forecast Cash vs. Forecast Accrual Differential Deferral Account - add $8,584 estimate for 2022 to the amount already recorded in cell BF58 of $100,342 for 2021	DVA Continuity Tab 2b.
9-Staff-78	Account 1508 Sub-Account Revenue Requirement Differential Variance Account related to Capital Additions - review and update 2016-2020 for $72,805. Combined with response to 9-Staff-76, net principal adjustment in cell BF55 is $43,463.	DVA Continuity Tab 2b.
9-Staff-79	Account 1518 - add estimate for 2022 - debit $11,840	DVA Continuity Tab 2b.
9-Staff-79	Account 1548 - add estimate for 2022 - debit $84,308	DVA Continuity Tab 2b.
9-Staff-84	LRAMVA carrying charges to reflect Q3 OEB Prescribed Interest for remainder of 2022	DVA Continuity Tab 2b.

9-SEC-26	Same as 9-Staff-75: Account 1508 Sub-Account Revenue Requirement Differential Variance Account related to Capital Additions - add amount for 2021	DVA Continuity Tab 2b.
9-SEC-26	Same as 9-Staff-76: Account 1508 Sub-Account Revenue Requirement Differential Variance Account related to Capital Additions - add amount for 2022	DVA Continuity Tab 2b.
9-SEC-26	Same as 9-Staff-78: Account 1508 Sub-Account Revenue Requirement Differential Variance Account related to Capital Additions - revised amounts for 2016-2020	DVA Continuity Tab 2b.
9-Staff-80	Change allocator from connections to customers for Street Lighting for Group 2 accounts 1518 and 1548.	DVA, Tariff Schedule & Bill Impact Model
Per above	DVA rate riders have been updated, accounting for DVA changes noted above	Tariff Schedule and Bill Impact Model
Per above	Distribution Rates have been updated in the RRWF, accounting for revenue requirement updates noted above.	RRWF – Tabs 11 & 13 Tariff Schedule and Bill Impact Model

EXHIBIT 1 – ADMINISTRATION

<u>Interrogatory 1-Staff-2</u>

OEB Model Updates/Amendments
Ref: Chapter 2 Filing Requirements, page 3

Question(s):

As required in the Chapter 2 Filing Requirements, please provide a summary of any updates or amendments to an OEB model to accommodate Kingston Hydro's circumstance, if applicable.

<u>Response</u>

Kingston Hydro customized the PILs model for its particular circumstance in smoothing the impact of the elimination of the accelerated CCA in 2024.

EXHIBIT 1 – ADMINISTRATION

<u>Interrogatory 1-Staff-3</u>

OEB Directive from Previous OEB Decisions
Ref: Exhibit 1, Tab 3, Schedule 11, pages 1-2

Preamble:

In its Custom IR Application Settlement Proposal, Kingston Hydro agreed "…to develop meaningful metrics/targets and to define outcome reporting." In response, Kingston Hydro retained a consultant (Metsco) to prepare a report on theses metrics. Kingston Hydro stated that it has since selected some of the metrics and reported the associated outcomes in its DSP but does not specify which ones.

Question(s):

a) Please provide a copy of the report prepared by Metsco.
b) Please specify which metrics and associated outcomes were reported on in Kingston Hydro's DSP.

<u>Response</u>

a) Metsco has given permission for Kingston Hydro to submit to the OEB the attached report entitled "Kingston Hydro Distribution System Plan Custom Performance Measures Development Final Report" dated July 20, 2018. Metsco requested

Kingston Hydro to include the following pretext in the interrogatory response:

> *"The METSCO report was carried out in 2018, and regulations and policies may have changed since then, and therefore some of the observations in this report may have been surpassed by market/condition developments. This report was also originally produced for internal use by Kingston Hydro and was not designed for external publication."*

b) The following table summarizes the metrics and associated outcomes from the Metsco Report that were reported on in Kingston Hydro's DSP:

Category	DSP Secton 5.2.3.1 (iii)	Metsco Report Section 2, Figure 2-1, page 11
Customer-Oriented Performance (COP)	A1	1. Average Customer Hours Interrupted (CHI) during "Severe Weather" Hours
	A2	2. Customer-Average Interruption Duration (CAIDI): "Top 10" Hours
	A3	4. Automated Outage Identification Implementation Progress (OMSdependent)
Planning and Execution Efficiency & Effectiveness (PEEE)	B1	5. Warehouse Average Days in Inventory
	B2	6. Group Procurement Materials Cost Savings (%)
	B3	8. Progress of OMS/GIS/CIS Systems Integration
Equipment-Specific Performance (ESP)	C1	1. Gas-Insulated Switch Planned Outage Customer Hours of Interruption (CHI) Avoided
	C3	3. Average CHI for Defective Equipment Outages
	C4	4. Defective Equipment System Average Interruption Frequency Index SAIFI) by Asset Class:
		a. Poles
		b. Underground Cables
		c. Transformers

Response to Ontario Energy Board (OEB)

Interrogatory #1-Staff-3 (a)

Attachment 1 of 1

(Kingston Hydro Distribution System Plan Measures Development)

METSCO

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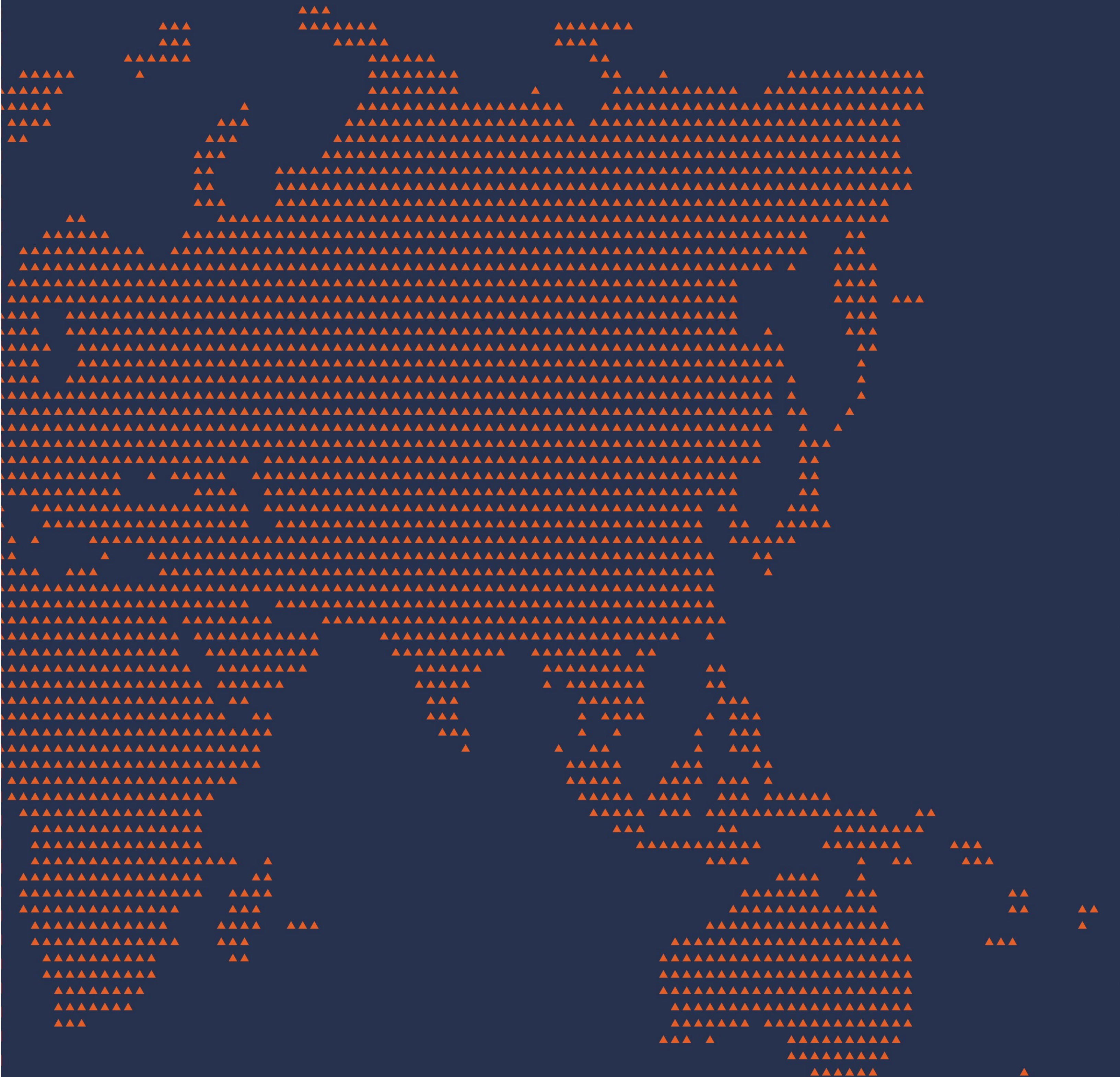

Kingston Hydro Distribution System Plan Custom Performance Measures Development

Final Report

Prepared For:

Kingston Hydro Inc.

Prepared By:

METSCO Energy Solutions
2550 Matheson Blvd East
Mississauga, ON, L4W 4Z1

Kingston Hydro Distribution System Plan Custom Measures Development

Final Report

METSCO Report # 18-128

July 20, 2018

Experts:

Alex Bakulev, Ph.D.
Vice-President, Assets and Strategy

Dmitry Balashov, MBA, MPA
Director, Utility Strategy and Economic Regulation

Expert Support: Mubbashir Ali, Ph.D.
Associate, Asset Management Analytics

Approved By:

Thor Hjartarson, M. Sc., P. Eng.
Chief Executive Officer

Version History

Version	Date	Description
Version 1	May 15, 2018	Final draft report
Version 1.1	July 20, 2018	Final Report

Disclaimer

This 2018 report has been prepared by METSCO Energy Solutions Inc. ("METSCO") for Kingston Hydro Inc ("Kingston Hydro"). Neither Kingston Hydro nor METSCO, nor any other person acting on their behalf makes any warranty, expressed or implied, or assumes any legal responsibility for the accuracy of any information or for the completeness or usefulness of any process disclosed or results presented, or accepts liability for the use, or damages resulting from the use, thereof. Any reference in this report to any specific process or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement or recommendation by Kingston Hydro or METSCO.

1. Background

Utilities Kingston ("UK"), the affiliate service provider for Kingston Hydro ("KH"), retained METSCO Energy Solutions Inc. ("METSCO") to develop a framework of performance metrics and benchmarking standards supporting the KH Distribution System Plan ("DSP"), in a manner compliant with the Ontario Energy Board's ("OEB") performance measurement policy direction, and consistent with the terms of Kingston Hydro's Final Settlement Proposal as amended November 10, 2015 for OEB 2016 Custom IR ("CIR") application #EB-2015-0083 (hereafter referred to as the "Final Settlement").

METSCO's recommendations on the framework of performance measures are informed by the following inputs:

- Terms of KH's Final Settlement, and relevant OEB guidance documentation;
- On-site and phone interviews with Kingston Hydro subject matter experts;
- Review of select KH's planning and operating data requested by METSCO staff;
- An industry best practices scan of operating, capital, and weather-related metrics;
- METSCO's expertise in the areas of asset management, utility strategy and distribution system plan development.

Our recommendations reflect our findings of the current state of Kingston Hydro's asset management function and broader operations, advancements made in recent years, along with longer-term objectives that the utility is contemplating pursuing in the future. While we provide concrete recommendations for potential performance measures, the final decision as to the measures ultimately advanced to the OEB and the intervenors in the context of the current Final Settlement will be Kingston Hydro's, based on professional judgment of the utility's management, and other considerations as may be relevant.

In general, we note that the overall list of measures that we advance in this report is extensive and significant, especially in the short term. It is also important to point out that in some cases the appropriate systems required to collect, maintain and analyze the data needed to establish the metric will need to be created, such as a host of IT capabilities and operating processes supporting them. In this regard Kingston Hydro will need to carefully assess the merits of proceeding to implement some of these metrics. However, these recommendations are effectively aimed to help Kingston Hydro consider future operational and planning improvements over the long term.

We conclude our report with recommendations as to the potential peer group of comparable utilities that KH's DSP performance could be compared against in general terms. Although peer groups can be useful to compare performance we acknowledge that any such comparisons must be done carefully to ensure the metrics are similar in intent. The scope of our engagement did not include that type of analysis.

We also note that since our engagement was grounded in a review of Kingston Hydro's system needs and the state of its asset management tools and processes, the primary objective underlying our recommendations is a set of metrics that would assist Kingston Hydro specifically. While we believe that many of the measures we recommend would be suitable for cross-utility comparison in general, this would ultimately depend on the state of each utility's business process organization, data access, and respective asset management priorities.

Based on our experience and expertise in the area of asset management in the context of Ontario and beyond, it is our firm expectation that a number of potential combinations from among the measures that we propose in this report (as ultimately selected by Kingston Hydro's management) should meet the formal OEB requirements as defined in the Chapter 5 of the Distribution Rate Application Fling Requirements, and the expectations of parties to the Final Settlement that preceded the present engagement.

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Table of Figures:

2. Executive Summary

Kingston Hydro is a medium-size urban utility in Eastern Ontario, operating a looped distribution system connected to both Hydro One transmission and distribution systems. Kingston's system is comprised of 67% overhead and 33% underground assets, and includes a historical downtown core, which features a legacy underground secondary distribution system. The utility's current (2016-2021) Distribution System Plan is predominantly Capital Renewal oriented, with nearly 70% of system investments falling into this investment category.

As detailed in the subsequent sections of the report, Kingston Hydro has generally approached its capital renewal strategy in prioritized phases and leveraged the redundancies inherent in its looped system design to defer costly reactive repairs to a number of failed underground system assets. While the underground cables represent a frontier of asset renewal targeted in the medium term, the utility's current focus is on overhead infrastructure renewal, along with several major projects.

Kingston Hydro has also made material advancements in its capabilities to track and analyze system asset needs, including a new asset registry, which is being integrated with other utility IT systems, and an asset condition database for wood poles, based on six years of data (two full inspection cycles) collected by crews. Other ongoing enhancements to asset management systems and processes include the implementation of an Outage Management System ("OMS"), new approaches to vegetation management, and early work to determine the viability of underground cable life extension techniques, among others.

Based on our review of the utility's current strategic and operational approaches to capital and maintenance work planning and execution, and the examination of publicly available information regarding the industry approaches to performance measurement explored in Section 4, we recommend 20 potential performance measures that Kingston Hydro's management can consider in its selection of potential metrics for the purposes of meeting the terms of its Final Settlement. Section 6 of this report details METSCO's rationale for proposing each metric, along with the verbal representation of a potential formula that could be used for the purposes of measurement.

While all metrics have been proposed on the basis of observed issues specifically relevant to Kingston Hydro, METSCO recommends that the utility select no more than six to 10 total measures for the purposes of DSP performance measurement over a single incentive rate period. In our experience, and as extensively discussed in leading business management literature, adoption of a large number of metrics does not necessarily translate into operational or strategic success, given the loss of focus by both staff and management that often accompanies the pursuit of multiple objectives.

As some of the recommended options would necessitate the implementation of capabilities that Kingston Hydro is only beginning to implement (e.g. OMS) or is considering implementing in the future (e.g. DMS), the utility may wish to rank the metrics on the basis of potential planning horizons (e.g. near-term, medium-term, long-term) over which their implementation may be strategically beneficial, operationally feasible, and/or financially viable. However, aside from recommending that the selection of performance measures for the purposes of the Final Settlement balance all three categories of measures mandated by the OEB (see Section 3 of this Report), we leave the ultimate selection of the measures to the discretion of Kingston Hydro's management.

The table of measures proposed in this report is detailed below:

Figure 2-1 Summary of Recommended ed Measures

Customer-Oriented Performance	Planning and Execution Efficiency & Effectiveness	Equipment-Specific Performance
1. Average Customer Hours Interrupted (CHI) during "Severe Weather" Hours 2. Customer-Average Interruption Duration (CAIDI): "Top 10" Hours 3. Planned Road Cuts Sharing / Coordination Ratio (%) 4. Automated Outage Identification Implementation Progress (OMS-dependent) 5. Customers Experiencing Multiple Interruptions (CEMI) 6. Customers Experiencing Long Duration Interruptions (CELID)	1. Emergency Maintenance as a Portion of Total Maintenance (%) 2. Warehouse Materials on Time and in Full (OTIF %) 3. Design/Completion Project Spend Average Variance (%) 4. Wood Pole Asset Value Chain Breakdown ($ and %) 5. Warehouse Average Days in Inventory 6. Group Procurement Materials Cost Savings (%) 7. Percentage of Asset Base with Health Index Scores 8. Progress of OMS/GIS/CIS Systems Integration	1. Gas-Insulated Switch Planned Outage Customer Hours of Interruption (CHI) Avoided 2. Percentage of Station Transformers at 90%+ Subscribed Capacity 3. Average CHI for Defective Equipment Outages 4. Defective Equipment System Average Interruption Frequency Index SAIFI) by Asset Class: a. Poles b. Underground Cables c. Transformers 5. Replacement Value of Poles in Poor and Very Poor Condition 6. Most Vulnerable Feeder SAIDI/SAIFI/CAIDI

Notably absent from our recommended measures are any measures of unit costs of asset installation or maintenance work (such as $/pole). As explained in more detail in the industry scan contained in Section 4, we see these "gross" unit cost measures as largely unhelpful given the differences in factors not related to operational efficiency that they typically encompass, which must be isolated from the operating performance drivers prior to comparing costs across enterprises.

Given the practical issues associated with performing this level of analysis, among the measures we propose is the Wood Pole Value Chain Breakdown measure that separates the total capital cost of an average Wood Pole and Fixtures into the cost components (both in $ and %) corresponding to stages of its value chain – from materials procurement to installation. In our assessment, the breakdown of total costs of a representative asset into its value chain cost drivers provides an opportunity for Kingston Hydro to draw more detailed operational insights both over time and across utilities. While deriving this metric involves a more rigorous level of analysis than a simple comparison of total unit cost metrics, we believe that the additional effort in tracking is offset by the benefits of the insights that it can yield over time, provided that tracking is limited to one or two asset classes representative of the system or a particular capital program.

Based on our analysis of the system characteristics and Distribution System Plan submissions of Ontario utilities, we recommend the following peer group of broadly comparable Ontario utilities to include the following distributors:

- Waterloo North Hydro
- Festival Hydro
- Peterborough Utilities
- Westario Power
- Welland Hydro

The utilities identified above share some similarities in the size of their assets, percentage of overhead plant, customer numbers, the ratio between gross Property, Plant and Equipment (PP&E) and annual maintenance expenditures, among others. Further details underlying our proposed methodology are provided in Section 7.

The following section of this report recaps the existing OEB guidance with respect to DSP performance measures, along with METSCO's interpretation of this guidance.

3. Ontario Energy Board's Guidance on Distribution System Plan Performance Measures.

3.1. Formal Guidance

The formal guidance as to the form and function of performance measures accompanying distributors' Distribution System Plan submissions is provided in Section 5.2.3 of Chapter 5 of the OEB's *Filing Requirements for Electricity Transmission and Distribution Applications*. Distributors are required to "identify and define the methods and measures (metrics) used to monitor distribution system planning process performance,"[1] providing the purpose, definition, and motivation of each metric. Among other potential areas, the measures are expected to address three specific objectives, namely:

- "Customer Oriented Performance";
- "Cost Efficiency and Effectiveness with Respect to Planning Quality and DS Plan Implementation";
- "Asset and/or System Operation Performance."

Several examples are provided for the first two categories (namely "consumer bill impacts, reliability, power quality" for the Customer Oriented Performance metrics; and "physical and financial progress vs. plan; actual vs. planned cost of work completed" for Cost Efficiency and Effectiveness Performance Measures). Along with the definitions, the requirements state that utilities are expected to provide a summary of performance and performance trends over the historical period. This information must include the information (both aggregate and adjusted for Loss of Supply events) for SAIDI, SAIFI, and CAIDI. Finally, the requirements prescribe that distributors discuss how the information underlying the chosen measures has affected the Distribution System Plan and has been used to continuously improve the asset management and capital planning processes.

3.2. METSCO's Interpretation of Key Guidance Elements

METSCO is aware of two major precedents where the OEB has opined on appropriateness / compliance of proposed DSP metrics, namely the Decisions on Hydro One's and Toronto Hydro's respective Custom IR applications.[2] In both cases, the OEB's commentary emphasizes the need for measures that are focused on outcomes being achieved, rather than activities being accomplished, and enable evaluation of year-over-year performance improvement, including performance improvements for specific asset categories, and costs per unit installed, among others:

[1] This, and all subsequent references to the requirements are drawn from: Ontario Energy Board, "Filing Requirements for Electricity Transmission and Distribution Applications," Chapter 5, p. 11.
[2] EB-2013-0416 and EB-2014-0116 respectively.

> *"There does not appear to be any measurement of units of activity and their costs that would allow for year over year assessment of improvement in Toronto Hydro's proposed metrics. The OEB agrees with the parties which suggested that reporting measures such as specific performance improvements sought and achieved per asset class, tie-ins of capital program spending to the dollar value of OM&A savings achieved and how program spending specifically impacts the reliability and quality of service are desirable under the RRFE. However, as the RRFE is relatively new, the OEB does not expect all such measures to be implemented at once."* [3]
>
> ----
>
> *"A number of Hydro One's measures are activity-based such as the number of substations refurbished, rather than being outcome-based whereby the number of outages avoided or length of outages reductions as a result of the substation refurbishment would be measured. Furthermore, in some cases the trends in targets for the proposed measures do not show year-over-year improvement. Based on the evidence provided, it is unclear whether Hydro One's customers would understand the value proposition associated with Hydro One's plan."* [4]

The above quotes from both decisions make it clear that the OEB expects to see measures that demonstrate efforts to drive more value for money and demonstrate measurable change in performance over time. However, based on METSCO's review of the OEB jurisprudence on this issue to date, the Regulator has not specifically defined the three metrics categories beyond the language in the Filing Requirements referenced above. Accordingly, in attempting to define each of the categories below, METSCO is relying on its professional judgment, supported by input from OEB staff and other stakeholders consulted since the release of the filing guidelines in 2013. In addition to the examples provided by the OEB in the filing requirements, we interpret each of the three metric categories in the following way, and provide examples of performance areas relevant to Kingston Hydro's operating environment, which in our assessment correspond to these definitions:

3.2.1. Customer-Oriented Performance

METSCO Interpretation: System performance characteristics, agnostic to particular equipment types or feeders, that may be noticeable by, and relevant to regular customers and their expectations of the costs and/or levels of service provided by a utility.

KH-Specific Issues of Relevance: Severe weather events and their influence on system reliability, the impact and cost effectiveness of the new vegetation management approaches, multi-utility model planning, coordination and cost efficiency benefits.

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[3] OEB, EB-2014-0116, Decision and Order, p. 6, December 29, 2015
[4] OEB EB-2013-0416/EB-2014-247, Decision and Order, p. 19 March 12, 2015

3.2.2. Cost Efficiency and Effectiveness of Planning Quality and Implementation

METSCO Interpretation: Indicators of whether and how the utility's tools and processes enable it to control the cost, scope, and timing of its work program – while attaining targeted service quality standards.

KH-Specific Issues of Relevance: Major projects (Princess St and Municipal Station 1 Rehabilitation); group procurement savings exploration; operations/warehouse coordination, multi-year planning objectives, asset count tracking, engineering research.

3.2.3. Asset and / or System Operation Performance

METSCO Interpretation: Specific performance or condition characteristics of particular asset classes, feeders, or system sub-areas (be they geographical or electrical) prioritized by a distributor in a particular planning period.

KH-Specific Issues of Relevance: Mitigation of scheduled outages through oil breaker replacement, reduction of available system redundancies through deferral of reactive underground work, projected station capacity requirements by large customers, asset condition assessment data collection and utilization, cable injection effectiveness exploration.

METSCO advances these issue areas as potentially relevant and consistent with the OEB guidance based on the insights from our engagement with Kingston Hydro. However, we do so in full anticipation that Kingston Hydro may identify other areas that are equally or more relevant and responsive to the OEB and stakeholder expectations, as the sector collectively understands them today.

3.2.4. Historical Results, Forward-Looking Targets, and Manner of Metric-Plan Interaction

The final area of the OEB guidance on DSP performance metrics concerns presentation of historical results, setting of targets and demonstration of whether and how the proposed measures drive the objectives of the plan itself. Kingston Hydro finds itself in an unusual position of developing measures halfway through the planning period, which renders the task of showing how the measures drove the planning process somewhat redundant. It does, however, provide the utility with an opportunity to showcase the degree to which the metrics are representative of the planning objectives that drove the proposed and approved investments (essentially reversing the implied causality of the OEB requirements, without substantially changing the nature of the outcome).

With respect to target-setting, the Filing Requirements mention targets in association with measures. However, in the case of Toronto Hydro, who did not propose firm targets in its inaugural CIR filing,[5] motivating this decision by the novelty of the requirement and some of

[5] OEB, EB-2014-0116 Chapter 5

the metrics it proposed, the OEB permitted the utility to forgo the targets for the first CIR period, in spite of the criticism of this feature by the intervenors.[6] As such, it is reasonable to infer that the OEB generally expects there to be targets, but could be amenable to making limited exceptions if it saw that the proposed measures were sufficiently new, untested and represented continuous improvement on the part of a distributor proposing them.

Similar logic can be expected to apply to presentation of past results, with the exception of the system-wide reliability statistics (SAIDI, SAIFI, CAIDI), where results presentation is mandatory by way of the Distributor Scorecard. In other cases, the OEB may be amenable to accepting metrics without past experiences if an applicant demonstrates that the information underlying the measure(s) was not previously tracked, or that obtaining historical information would involve significant effort.

In conclusion, METSCO believes that given a limited amount of available precedents and limited prescriptiveness of the applicable OEB requirements, Kingston Hydro has an opportunity to define and substantiate the metrics it chose to advance on the basis of the utility's priorities and the state of its asset management tools and processes, thereby advancing the collective discourse in this issue area.

The following section of the report lays out the findings of an industry scan with respect to the relevant aspects of capital and operating performance measurement applicable to electric utilities.

[6] OEB, EB-2014-0116, Decision and Order, p. 47, December 29, 2015

4. Industry Scan

As a part of its engagement with Kingston Hydro, METSCO conducted an industry best practices scan, consisting of three broad areas:

- Approaches to benchmarking used in Operations Management theory
- Utilities industry approaches to capital- and operations-related performance measures;
- Utilities industry approaches to weather event-related performance measurement.

We chose to include a survey of select approaches recommended by Operations Management theory to supplement the scan of actual metrics deployed by utilities, in order to explore alternative approaches to those currently deployed in the industry, thus advancing the understanding of the issue area on the part of Kingston Hydro's management and other stakeholders that may review this report.

Given Kingston Hydro's commitments in the Final Settlement with respect to developing metrics related to equipment's performance during inclement weather events, we dedicate a separate subsection to this issue area, which is yet to be explored in significant detail in the context of Ontario's utility sector, beyond the Major Event Day (MED) performance reporting introduced by the OEB in 2016.

4.1. Operations Management Theory Approaches to Benchmarking

4.1.1. Operational Competitive Benchmarking

To date, benchmarking in the context of Ontario's electricity regulation landscape has been largely limited to comparisons of unitized metrics such as cost per customer or km of line, along with econometric efficiency benchmarking models where a utility's total cost performance is compared with model-derived expected total cost result, given the input variables like system length, customer counts, and peak load, among others.

While these approaches are favoured by a number of utilities and regulators, their arguable limitation stems from the fact that they are not optimally positioned to enable adjustments for considerations like management's strategic decisions (e.g. transferring rear-lot overhead assets to front lot underground services, replacing assets proactively based on condition assessments, etc.), or the impact of scale of operations, which is in many ways a function of historical developments (e.g. legacy asset mix selections) that are largely outside of a given utility's control in the short run.

Whether firms differ in their approaches to asset replacement strategies, their targeting of particular reliability performance levels, or their emphasis on certain customer service approaches, each utility's total cost performance reflects the trade-offs firms adopt. In a similar manner, each firm's total cost position reflects their access to scale economies for particular production inputs driven by size, location, and other factors that they may not be able to affect in the near term. To the extent that aggregate unit costs, or econometric model results are compared between two or more companies with different strategic priorities and available scale economies, these comparisons (whether made on total cost, or unit cost basis) would not yield meaningful comparative insights, as each captures the cost implications of a range of discretionary factors (like strategic choices) and non-discretionary operating realities (like scale economies access) that each company is subject to a varying degree.

Equally impactful for the purposes of comparisons may be internal accounting practices, including threshold criteria for deeming the assets to be in service, capitalization practices, useful life assumptions, and other criteria where a degree of managerial discretion may exist within the bounds of governing accounting standards. Without explicitly accounting for these factors, a benchmarking assessment may imply operating performance differences that are grounded in accounting process fundamentals.

Accordingly, it is METSCO's position that aggregate-level Dollars/Units measures produce limited operating insights, absent more detailed breakdown of the cost drivers underlying a particular utility's, or their peer group's cost structures. Without explicit adjustments for these factors, a reduction in any given $/unit ratio does not yield meaningful results of cost reduction given a particular strategic position, and instead becomes a measure of cost reduction *over all potential strategic positions* (e.g. various types of service territories or approaches to asset intervention and replacement scope and timing, etc.).

A more granular cost benchmarking approach[7] involves breaking down the total cost (and its changes over time) of a particular firm and its peers into three discrete components (and potentially more) captured in the expression below:

$$\Delta C = \Delta C_{OE} + \Delta C_{S} + \Delta C_{V\,(C)} - \Delta C_{V\,(P)}$$

ΔC – an aggregate cost differential between two or more firms, or between the costs of the same firm over time, as its operating conditions or strategy evolve (typically presented on a per unit basis).

ΔC_V – refers to the Volume- or utilization driven cost differential, and represents extra costs incurred by operating at less than optimal utilization level (that is below the optimal scale), leading to spreading the fixed costs over a lower number of output units. The subscripts V(C) and V(P) respectively refer to the Company being benchmarked and Peers against which the comparison is made.

[7] Methodology: Milner, 2017 "Operations Management Competencies and Competitive Threats," RSM5401 Winter 2017, University of Toronto, Rotman School of Management. Underlying concepts discussed in: Banker and Morey: "Efficiency Analysis for Exogenously Fixed Inputs and Outputs." Source: *Operations Research*, 1986 Vol. 34, No. 4; Yang and Paradi: "Cross Firm Bank Branch Benchmarking Using "Handicapped" Data Envelopment Analysis to Adjust for Corporate Strategic Effects" *Proceedings of the 39th Hawaii International Conference on System Sciences*, 2006.

ΔC_S – refers to the Strategy-driven cost differential, inherent in the way a company in the competitive market chooses to compete (e.g. a low-cost discount airline vs. a luxury carrier). In the context of regulated electric utilities, this can be thought of as the specific conditions of a particular utility's service territory and asset base, along with strategic choices made by management (such as maintaining a particular level of reliability that may be more or less costly than alternatives, or the approach to asset replacement).

ΔC_{OE} – the residual component of cost differential, after controlling for current scale/volume and strategic choices that the company is unable or unwilling (due to management's decisions) to change in the near-term. According to Operations Management theory, this is the one component of a firm's total cost position, along which meaningful comparisons of operating efficiency can be made, as it effectively compares the firms' performance efficiency levels if all firms in a sample operated at the optimal scale and provided identical product offerings.

As with most frameworks requiring rigorous analysis of multiple discrete factors, the practical implementation of operational effectiveness benchmarking using this model is both time-consuming and reliant on a number of assumptions.

The process typically proceeds by way of a detailed operations audit where (a) a notional efficient scale of operations is calculated or estimated; (b) a particular unit of comparison is established (e.g. a product batch or a standard service task); (c) a company's and competitors' costs are broken down into fixed and variable components; (d) cost differences across fixed and variable categories of benchmarked firms' costs in producing the defined unit of comparison are calculated; (e) cost differences are analyzed and assigned to either Strategic, Volume-based, or Operational cost differentials type; and (f) the difference between the entities Operational Effectiveness cost differentials is examined in detail to establish why one entity's costs are lower than its peers'.

4.1.2. Value Chain Impact Analysis

Another approach that may be useful for the purposes of more rigorous capital cost benchmarking comes from the field of Competitive Strategy. The Value Chain approach[8] as proposed here involves establishing the sequence of steps that a given product undergoes from being a raw material supplied to the firm to becoming an end-product, marketed and ultimately distributed to the end consumer. At each stage of the Value Chain, from Raw Materials to Marketing and Distribution, a product's total cost increases, as incremental economic value is added to it, along with a return margin earned by a business unit or a separate entity along the value chain.

The Value Chain analysis is thus used as a form of a "roadmap" that captures how much of a product's final cost is added at each step of the value chain. The results of this analysis are

[8] Porter, M. E. *The Competitive Advantage: Creating and Sustaining Superior Performance*. NY: Free Press, 1985.

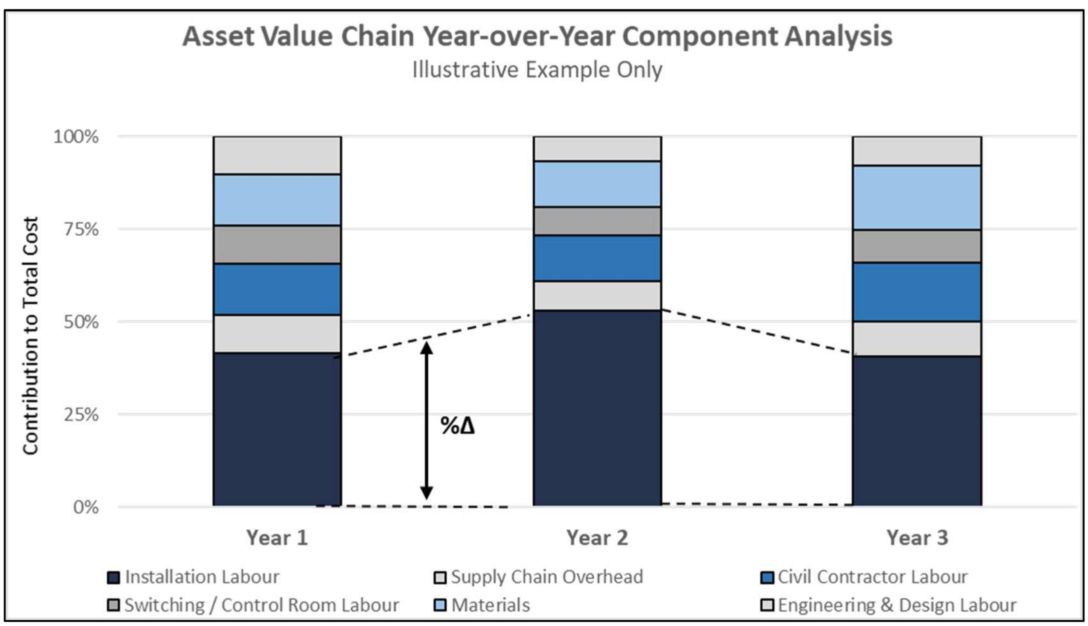
then used to formulate decisions regarding strategic or operational changes that a firm may consider to attain particular objectives (e.g. acquire a supplier, reduce marketing spend, implement new labor-saving capital equipment).

In the context of electric utility capital cost benchmarking, the concept of Value Chain can be used to track the relative breakdown of an asset's total capital cost (e.g. a wood pole) by various stages in utility's operation that add value (and corresponding costs to the final installed product) – from materials procurement, to supply chain and warehousing costs, engineering and design labour, installation and energization labor, corporate overhead, etc.

The numerical insights obtained from this type of analysis (displayed as Dollar Figures and/or Percentage of Total Cost) could entail a reasonably granular measure of a utility's operational capabilities in constructing capital projects over time, or relative to peers. Each value chain stage could have a certain "controllability" score associated with it – i.e. the extent to which the utility is able to affect the costs at its current scale and regulatory requirements. As with our discussion of Competitive Operations Benchmarking Theory above, allowance/adjustments for scale and strategy would make the analysis substantially more rigorous, particularly if peer-to-peer assessments are conducted. These adjustments, however, would not be necessary if benchmarking was conducted relative to one's own cost over time.

Figure 4-1 presents a graphic representation of this type of analysis (numbers and categories displayed are for illustrative purposes only):

Figure 4-1: Sample Value Chain Analysis - Illustrative Example Only



To avoid concerns about comparability across discrete projects, numbers of circuits, and other granular operating characteristics that legitimately differentiate otherwise similar projects, the analysis could apply a number of accepted statistical normalization techniques, focus on asset subcomponents that are generally common across similar installations, and/or control for factors like the area of installation within a utility's service territory (e.g. downtown core, midtown, outskirts). A more advanced methodology could also factor into the analysis a measure of lifetime maintenance costs that a utility would expect to incur in relation to a particular asset, based on assumptions of in-service life expectancy and the incidences (and cost) of reactive maintenance activities.

While the methodologies discussed above represent opportunities for Kingston Hydro and other Ontario utilities to explore new frontiers of performance measurement, we note that none of them are currently employed in Ontario, nor are we aware of their wide utilization elsewhere in North America. As such, we suggest that Kingston Hydro exercise caution with respect to the scale and pace of potential adoption of any such measures, by weighing the benefits of potential tracking relative to (considerable) costs involved, and the implications as to the lack of consensus involved in these tools. However, and as we discuss in our section on recommended metrics, Kingston Hydro and METSCO concluded that the Value Chain Analysis was the preferred and most practical option to implement.

4.2. Practical Examples of Capital Performance Measures Tracked

This section captures the results of METSCO's scan of relevant capital performance measures deployed in Canadian and foreign jurisdictions and reflected in publicly accessible documents. We note that in most cases, the specific metrics we highlight are taken from broader frameworks, such as balanced scorecards and were selected on the basis of relevance to the core objective of our engagement with Kingston Hydro. Accordingly, in preparing the following section, we omitted any metrics related to safety or customer satisfaction in particular – two areas that are of utmost importance to electric utilities and that are present in virtually every jurisdiction that we have examined. We chose to omit the presentation of these metrics given the extent to which they are already captured in the OEB's reporting requirements (most notably the Distributor Scorecard).

4.2.1. Canadian Jurisdictions

4.2.1.1 Ontario

Capital performance measurement is a relatively recent regulatory construct in Ontario, introduced in conjunction with the development of the Renewed Regulatory Framework (RRF) commencing in 2011. Utilities, particularly those filing Custom Incentive Regulation (CIR) applications are required to submit a set of Custom Performance Measures to track the efficiency, effectiveness and operating performance of their capital planning and implementation programs. While a limited amount of utilities submitted custom measures thus far, often proposing to track no measures beyond the standard OEB Scorecard metrics, several applicants have advanced specific measures, that in their assessment, were relevant to their planning and execution objectives.

Toronto Hydro

In its 2015-2019 CIR application, Toronto Hydro proposed the following Distributing System Plan (DSP) performance measures:

Figure 4-2: Toronto Hydro 2015-2019 CIR Metrics

Customer-Oriented Performance	Capital Plan Execution Efficiency and Effectiveness	Equipment-Specific Performance
System Average Interruption Duration Index (SAIDI) System Average Interruption Frequency Index (SAIFI) Customer Average Interruption Duration Index (CAIDI) Momentary Average Interruption Frequency Index (MAIFI) Feeders Experiencing Seven or More Sustained Interruptions (FESI-7)	Capital plan spend to date, vs. the 5-Year Total Plan spend (%). Supply Chain "On-Cost" Uplift Metric (%). Engineering Cost Efficiency - capitalized engineering labour in total system-related capital expenditures (%) External vs. Internal Crew Construction Cost Performance (%). "Asset Assembly" Initiative Progress Reporting.	Number of Network Stations with peak load in excess of 90% of capacity. Defective Equipment-caused Outages in a 12-month period.

Hydro One Distribution

Hydro One's 2018-2022 CIR Application includes a number of performance metrics corresponding to all four OEB RRFE outcomes. The following list captures a subset of these metrics, focused on those related to Capital and Maintenance activities. Given that Hydro One's application did not assign these measures across the three categories presented by the OEB, we present these metrics as a single list:

- Total Cost per Customer and Line Kilometer (km);
- *OM&A per Customer and Line km*;
- *Pole Replacement Cost per unit*;
- *Vegetation Management* – Cyclical Cost per km of line clearing
- *Station Refurbishments* – Cost per MVA
- *Rural and Urban SAIDI and SAIFI*
- *Large Customer Interruption Frequency*
- *Number of Substation-Caused Interruptions*
- *Number of Vegetation-Caused Interruptions*
- *Number of Line Equipment-Caused Interruptions*
- *DSP Implementation Progress (%)*

2011 Hydro One Productivity Study by Oliver Wyman

In the course of our research for this project, METSCO found a 2011 survey of productivity measures employed in the industry prepared by Oliver Wyman in support of Hydro One's 2011 application. Given that it represents a public document submitted to the OEB, we chose to reproduce the key findings of this report, as it provides a comprehensive (albeit dated) overview of the measures employed across the sector.

The study finds that there is a broad range in the number of metrics tracked by utilities and regulators surveyed, with the vast majority associated with Service Quality Requirements. An important finding of the study is that productivity measures that were collected were generally not benchmarked or reported to regulators. A median utility in the responder sample collected **six** Cost Tracking Metrics (Minimum: 1, Maximum :89), four Productivity Metrics (Minimum: 0, Maximum: 59) and 25 Service Quality Metrics (Minimum: 4, Maximum 176).

In exploring the range of productivity measures in particular, Oliver Wyman[9] identified four general measurement strategies, employed to varying degrees by participating utilities:

- Cost per Unit
- Unit per FTE
- Reducing Nonproductive Time (e.g. average travel time)
- Time Taken per Activity (e.g. average time per call).

Based on the survey, Oliver Wyman's recommendation to Hydro One was to select a relatively modest percentage of their total work activities by volume, that collectively represent a material portion of the total work program, around which potential productivity performance measures could be built. As a result, the consultant proposed a list of 25 measures reproduced on the following page. Of these, the utility selected three measures for tracking that were advanced in its 2013 Transmission rate application:

- Transmission Line Wood Structure Replacement
- Transmission Brush Control ($/treated hectare)
- Insulator Replacement ($/insulator).

[9] EB-2012-0031, Exhibit A, Tab 17, Schedule 2, Attachment 1, p. 2.

Figure 4-3: Measures Recommended in the Oliver Wyman Hydro One Study (2011)

#	Metric	Cost Coverage	% of total costs
1	Cost of brush control per km of line	$98M	4.6%
2	Cost per meter install	$82M	3.9%
3	Cost per pole set	$78M	3.7%
4	Cost per new service installed	$11M - $34M	1.1%
5	Cost per tower constructed	$13M - $26M	0.9%
6	Cost per tower foundation	$13M - $26M	0.9%
7	Cost per km of Tx line cleared (Capital)	$13M - $26M	0.9%
8	Cost per meter read	$22M	1.0%
9	Cost per upgrade	$14M	0.7%
10	Cost per km of transmission line refurbished	$14M	0.6%
11	Cost per insulator replaced	$8M - $13M	0.5%
12	Cost per cable locate	$12M	0.6%
13	Cost per km for line patrol	$6M - $10M	0.4%
14	Cost per breaker	$8M - $10M	0.4%
15	Cost per transformer	$9M	0.4%
16	Cost per RTU	$7M - $9M	0.4%
17	Cost per bill	$1M - $8M	0.2%
18	Cost per km of Tx line cleared (OM&A)	$7M	0.3%
19	Cost per protective device replacement	$2M - $5M	0.2%
20	Cost per Transformer Refurbishment	$4M	0.2%
21	Cost per service cancellation	$4M	0.2%
22	Cost per insulator inspection	$1M - $4M	0.1%
23	Cost per disconnect	$3M	0.2%
24	Cost per reconnect	$3M	0.2%
25	Cost per line inspection	$1M - $3M	0.1%
	Total	~$480M	~22%

Other Ontario Utilities:

A cursory review of other notable DSP submissions (e.g. Powerstream, Horizon, Ottawa), along with a survey of more than 10 utilities' Distribution System Plans that METSCO participated in, did not reveal any performance measures that are materially different from those described above in form or function, with few if any measures, going beyond the scope of the prescribed Distributor Scorecard.

Of note is also the fact that the OEB is yet to implement a standard province-wide measure of Distribution System Plan Implementation Progress, included as a part of the standard Distributor Scorecard metrics applicable to every regulated distributor. While this measure was expected to be put into effect in 2018, METSCO is unaware of any activities of the Working Group established to develop it, since that group's inaugural meeting in 2016.

4.2.1.2 Utilities in other Provinces:

Based on METSCO's work in other Canadian jurisdictions, we are aware of the following capital-related performance metrics that utilities in these jurisdictions track for the purposes of corporate or departmental performance measurement. We note that the following examples represent the metrics tracked at the corporate level only, while other metrics may be tracked on a department/functional level.

Saskatchewan

SaskPower's Balanced Corporate Scorecard[10] includes the following measures related to capital planning efficiency and effectiveness:

- *New Connect Construction Index (%)* – percentage of new connection delivery orders where construction was completed below the later of the need date indicated by the customer or the targeted cycle time for the relevant new connect order type.

- *OM&A / PP&E (%)* – the OM&A as a percentage of Property, Plant and Equipment is advanced as a measure of efficiency of SaskPower's management of its operating activities as the company's capital base continues to grow.

- *SAIDI and SAIFI* – SaskPower tracks both duration and frequency indices separately for its transmission and distribution systems.

- *Planned Maintenance %* - this measure captures the ratio of the sum of planned and corrective maintenance over the total annual maintenance spend – a higher ratio is preferred, indicating that more maintenance was completed ahead of time, rather in an emergency response situation.

Manitoba

Manitoba Hydro's Corporate Scorecard[11] includes several high-level measures related to capital activities that are tracked against the targets established by the company's Board of Directors:

- *SAIDI and SAIFI* – for the purposes of its corporate scorecard Manitoba Hydro tracks both duration and frequency indices together for its transmission and distribution systems.

- *Financial Expenditure Against Targets* – Manitoba Hydro tracks its overall OM&A expenditures, and total capital spend on Major Generation and Transmission Projects and Business Operations activities against the spend thresholds established at the beginning of the year.

[10] http://www.saskpower.com/wp-content/uploads/2016_17_Annual_Report.pdf
[11] https://www.hydro.mb.ca/regulatory_affairs/pdf/electric/general_rate_application_2017/03.1_appendix_3.1_integrated_financial_forecast_iff16.pdf

British Columbia

BC Hydro's Corporate Scorecard[12] includes the following measures related to capital performance:

- *SAIDI and SAIFI* – both reliability measures are tracked in a combined manner between transmission and distribution against the targets set by the Corporation's Board of Directors. A 10% annual deviation is considered acceptable given the range of external factors that can influence performance.

- *Project Budget to Actual Cost (%)* – the utility tracks the variance between originally approved "full scope implementation budgets" and final project costs. The measure is set on a five-year rolling basis and is measured against a target of +/- 5% variance.

Alberta

Both ENMAX[13] and EPCOR[14] track SAIDI and SAIFI as the only electrical capital-related performance measures on their respective corporate scorecards. A review of the Alberta Utility Commission's (AUC) website did not point to any other capital-specific performance measures in the context of service quality standards, with the exception of Meter Reading Accuracy.

4.2.2. Foreign Jurisdictions

The following is a list of performance measures tracked by utilities and regulators in other jurisdictions that METSCO has been able to identify through public document research and/or engagements with various clients, within the time parameters available for this project.

United Kingdom Office of Gas and Electricity Markets (OFGEM)

Under the OFGEM's RIIO ("Revenue= Incentives + Innovation + Outputs") Regulation Framework, the 14 UK distribution utilities report the following performance measures related to capital performance specifically:

- *Customer Interruptions and Minutes Lost* – total number of customers interrupted per 1,000 customers in a year, and average minutes duration of service lost per customer per year.

[12] https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/accountability-reports/financial-reports/annual-reports/bchydro-2016-17-annual-service-plan-report.pdf
[13] https://www.enmax.com/AboutUsSite/Reports/2017-ENMAX-Financial-Report.pdf
[14] https://www.epcor.com/about/Documents/EPCOR-MDA-2017.pdf

- *Average Time to Connect a New Customer to the Network* – relative to performance standards established by the regulator.

- *Undergrounding of Overhead Lines* (km length of installations and total expenditures) – the measure tracks the utilities' ability to meet their specific commitments to transfer overhead services underground in specific "environmentally sensitive areas" such as National Parks, Areas of Outstanding Natural Beauty, and National Scenic Areas.

- *Expenditure vs. Allowance* – the measure tracks the percentage of over/under-spend by utilities relative to the expenditure levels approved by the regulator for a given year.

- *Estimated Network Costs per Domestic Customer* – this long-term measure tracks the trends in total costs per customer for distribution companies relative to other components of a utility bill.

Beyond these specific performance measures, Ofgem-regulated Distribution Network Operators are also required to complete detailed worksheets for each functional area of the company, providing the work volumes and total costs and generating highly granular unit cost calculations that the regulator reviews as a part of its rate-setting process. While the unit cost analysis is factored into the ratemaking decisions, we see its primary purpose as being distinct from the performance measures described above.

Commerce Commission of New Zealand

<u>Regulator-Collected Performance Measures</u>

All 29 of New Zealand's distribution companies report annually on a broad range of operating and capital performance metrics, which the regulator condenses into a one-page dashboard that is made available to consumers. Along with the current year values, and where relevant, the reporting includes longer-term trends and/or performance relative to the vales estimated in utilities' regulatory filings (see Appendix for an example of the dashboard). The most relevant categories for the purposes of this analysis are the following:

<u>Capital Expenditures Measures</u>

- *Total Annual Capital Expenditures (Capex) / Asset Base*
- *Total Annual Capex / Number of Connections*
- *Total Annual Capex / Depreciation Spend*

<u>Operating Expenditures Measures</u>

- *Network Operating Expenditures (Opex) / Meter of Line*
- *Network Opex / Number of Connections*
- *Total Opex / kW of Deliveries*

- *Load Factor Percentage*
- *Loss Ratio Percentage*
- *Interruption Rate* – number of Interruptions per 100 km

Asset Health, Age and Replacement Plans

Data for all information categories noted below is presented for the following asset classes: Overhead and Underground Lines, Poles, Sub-Transmission Lines and Cables, Distribution Transformers, Distribution Switchgear, Substation Transformers and Substation Switchgear.

- *Asset Quantity*
- *Regulatory Book Value*
- *Average Health Score (1-5)*
- *Percentage of Grade 1 and 2 Assets (Very Poor and Poor)*
- *Percentage of Assets with Unknown Grade and/or Unknown Age*
- *Average Asset Age*
- *Percentage of Assets Estimated to Require Replacement over 5 years*
- *Percentage of Assets Planned for Replacement over 5 Years*
- *Forecast Average Annual Replacement Expenditures (5 Years)*
- *Five-Year Replacement Expenditure Trend*

Asset Management Process Maturity Evaluation Framework

In addition to the reporting metrics, the New Zealand Utility Regulator has also established a self-assessment framework[15] for utilities to gauge and report on their progress in enhancing the maturity levels of their overall planning processes. The framework is based on pre-determined criteria along 115 performance categories with corresponding parameters across five maturity levels. The utilities' self-assessment reports are subject to audits by the Regulator.

A sample of maturity level definitions comprising the framework is represented below:

Figure 4-4: Sample Maturity Assessment Questionnaire and Scale Definitions

Function	Question	Maturity Level 0	Maturity Level 1	Maturity Level 2
Life Cycle Activities	*How does the organization establish, implement and maintain process(es) and control of activities across the creation, acquisition, or enhancement of assets. This includes design, modification, procurement, construction and commissioning activities.*	The organization does not have process(es) in place to manage and control the implementation of asset management plan(s) during activities related to asset crteation, including design, procurement, construction and commissioning.	The organization is aware of the need to have process(es) and procedure(s) in place to manage and control the implementation of asset management plan(s) during activities related to asset creation, including design, modification, procurement, construction, but currently do not have these in place (note: procedures may exist but they are inconsistent / incomplete).	The organization is in the process of putting in place the process(es) and procedure(s) to manage and control the implementation of asset management plan(s) during activities related to asset creation, including design, modification, procurement, construction and commissioning. Gaps and inconsistencies are being addressed.

[15] http://www.comcom.govt.nz/regulated-industries/gas-pipelines/gas-information-disclosure/gas-information-disclosure-consultation/asset-management-maturity-assessment-tool-ammat-study-2/
Note: Representative partial example only. Maturity levels 3 and 4 are not shown.

Horizon Energy Distribution (New Zealand)

In addition to the performance statistics reported by the regulator, individual utilities in New Zealand have additional performance measures[16] that they track for the purposes of overseeing their asset management plans. The table below captures the relevant metrics tracked by Horizon Distribution Inc. (not to be confused with its former Ontario namesake).

Figure 4-5: Horizon Distribution (New Zealand) Reporting Measures

Key Service Criteria	Performance Parameters	Target Service Level
Quality	Voltage	Less than five legitimate voltage complaints per year
Environmental	PCBs	Zero Problems
	SF_6	Zero Problems
	Transformer Oil Spills	Zero Spills
	Asbestos	Zero Reports
Reliability	Faults per 100 Circuit km	5
	SAIDI	145 min
	SAIFI	1.8
	CAIDI	81 min
Service	Planned Outages Advertised Time Off	Meet 100% of planned outage timelines +/- 10 min.

Vector Distribution (New Zealand)

In addition to performance measures similar to those of Horizon, Vector Distribution – another New Zealand utility, tracks two specific capital efficiency metrics described below[17]:

Growth Capex Efficiency - this metric is designed to track the efficiency of investments made to support growth on the network – a ratio of annual increase in “effective capacity” to annual capex investment. The effective capacity measure (the numerator) includes both actual network capacity and demand side capacity managed (e.g. through load control).

Asset Integrity Capex Efficiency - the metric represents a ratio of annual increase in “Asset Life Value” to annual capex investment. The Asset Life Value is calculated by taking into account the Asset Replacement Cost and Asset Remaining Life. METSCO was unable to find a practical example of the calculation’s parameters within the timeframe of its assessment.

[16] http://www.hegroup.nz/sites/default/files/Horizon%20Energy%20Annual%20Report%202015.pdf
[17] https://vectorwebstoreprd.blob.core.windows.net/blob/vector/media/vector-regulatory-disclosures/electricity-asset-management-plan-2016-2026.pdf

4.3. Equipment Performance Measures Related to Weather Events.

As a final dimension of or inter-jurisdictional research endeavor, we explored industry best practices in relation to measures of system or equipment-specific performance in relation to weather phenomena, and particularly severe weather events that affect utility networks and their customers from time to time.

METSCO understands that Kingston Hydro has committed to explore the development of such metric(s) in the Final Settlement pertaining to its last CIR application. More generally, the utility is interested in the measures of this nature as a way to gauge improvements in system resilience as the utility's capital plant undergoes replacement, and the utility adopts new operating and maintenance practices. Given that Kingston Hydro has made specific commitments with respect to developing performance measures in this issue area, and the fact that the state of relevant industry practices has been explored to a lesser degree in the context of Ontario's regulatory regime, we dedicated a separate sub-section to explore the issue in sufficient depth.

The focus of our research was to explore whether and how utilities and/or other relevant entities have established any measures of system, or specific equipment performance (resilience) during weather events of particular severity. In other words, we sought to identify any examples of quantitative thresholds (in degrees, wind speed m/s, precipitation mm, etc.) that are used or could be deployed to evaluate ongoing operating and capital performance during poor and/or extreme weather events.

4.3.1. Environment Canada Weather Event Alert Thresholds

The starting point of our review were the Environment Canada standards[18] for issuing public alerts regarding upcoming weather events. METSCO saw this as a logical starting point to explore the climatic / weather threshold issue area, given that most utilities use these warnings and alerts to prepare for any significant weather events. Accordingly, while these threshold values have been devised for application beyond the context of utilities industry in particular, they are at once broadly applicable and relevant from an operational perspective.

Of the various categories listed on the Environment Canada website, METSCO compiled a table located on the following page, which contains the most potential relevance to Kingston Hydro's service area, given its geographical location, system equipment, and the types of weather phenomena associated with the area. Weather events are listed in an alphabetical order.

[18] https://www.canada.ca/en/environment-climate-change/services/types-weather-forecasts-use/public/criteria-alerts.html

Figure 4-6: Environment Canada Threshold Weather Parameters

Event Type	Alert Threshold Criteria (Environment Canada)	Relevance to Kingston Hydro (METSCO)
Extreme Cold	Temperature reaching -35°C for at least two hours	Increased loading due to higher and sustained demand on cold days (heat pumps, etc.), causing transformation equipment failures and malfunctioning of various other mechanical components. Extensive freezing around underground cables, faster insulation erosion due to freezing of moisture built up through natural ingress.
Freezing Rain	Freezing Rain (rain that freezes on impact to form a clear glass coating on the surface of contact) is expected for at least two hours.	Overhead system failures (poles, cables, pole-mounted transformers, insulators etc.) due to added weight of ice buildup and increased incidence of vegetation contacts.
Heat	Two or more consecutive days of expected daytime maximum temperatures of 31°C +, and nighttime minimum temperature of 20°C+, OR, Two or more consecutive days with humidex of 40°C+.	Increased loading due to higher and sustained demand on hot days (heat pumps, etc.), causing transformation equipment failures.
Hurricane	Average sustained wind speed of 118 km/h expected within the next 36 hours.	Widespread damage to overhead infrastructure through tree contacts and flying debris, dislodgment of poles, severing of conductors, etc.
Heavy Downpour Rainfall	50 mm or more of rainfall is expected within one hour.	Flooding of cable chambers and underground transformer chambers, flooding of above-ground transformer stations, increased incidence of vegetation contacts etc.
Long Duration Rainfall (Summer)	50 mm or more of rain is expected within 24 hours, OR, 75 mm or more of rain is expected within 48 hours	Accumulation of water cable chambers and underground transformer chambers, flooding of above-ground transformer stations, increased incidence of vegetation contacts, etc.
Long Duration Rainfall (Winter)	25 mm or more of rain expected within 24 hours	As above, with additional potential of damage caused by subsequent freezing of water accumulated in the underground chambers or absorbed over time by other equipment.
Severe Thunderstorm	One or more of the following conditions are met: a) Wind gusts of 90 km/h or greater; b) Hail of two cm+ in diameter; c) Heavy rainfall ("Downpour" criteria)	Various types of damage to overhead and underground equipment associated with severe wind and precipitation events.
Snowfall	When 15 cm or more of snowfall is expected to occur within 12 hours or less	Damage to above-ground infrastructure due to excessive mechanical loading caused by accumulation of snow on conductors, cross arms, nearby tress, branches, etc.
Wind	70 km/h or more sustained wind; and/or Gusts to 90 km/h or more.	Damage to overhead infrastructure associated with contacts by vegetation and other debris. Dislodgment of conductors, guy wires etc.

The preceding table illustrates a variety of weather phenomena where a particular threshold is associated with an event posing material risk to human activities in their normal course. While Environment Canada does not appear to discuss the exact rationales underlying their selection of particular thresholds, it is reasonable to assume that they are driven by the results of observational or empirical work. Notwithstanding the rationales for particular thresholds, the Environment Canada definitions provide useful directional indication of approximate magnitudes that can be investigated in the context of Kingston Hydro, subject to the following considerations:

- Confirmation of availability of weather data of sufficient comprehensiveness and granularity for Kingston Hydro's service area;
- Analysis of Kingston Hydro's actual reliability performance data relative to the occurrences of the above-noted weather phenomena, in a standalone manner or combination;
- Review of any relevant practices of similar nature that other utilities or standard-setting bodies may have adopted, or listed rationales for not adopting them;
- Consideration of managerial implications of such measures – including the extent to which the utility can materially affect performance in poor conditions in an economic manner.

The following section discusses the relevant industry practices identified through our research.

4.3.2. Industry Approaches to Weather Event Impact Measurement

METSCO's research has revealed several instances where weather thresholds are used as either regularly monitored indicators in the context of network operations, or longer-term planning parameters for the purposes of long-term system resilience planning and/or modification of existing industry standards.

Control Centre Operating Thresholds

One set of examples known to METSCO through its general industry interactions is employed by several urban utilities with extensive overhead systems. Operations staff at these utilities monitor wind speed and/or direction as a part of their regular Control Centre / Dispatch functions. Based on previous experience, these utilities use a threshold of wind speeds above 50-60 km/h sustained for two or more hours, as an indication of potential increase in the occurrence of overhead system outages, and the ensuing need to issue additional crew standby orders.

In addition to the speed, some utilities also monitor the forecasted direction of winds over the coming 24 hours, noting any forecasted instances of sustained shifts away from the prevailing wind directions for a given season. While, to METSCO's understanding, these practices primarily reflect operational experience rather than formal empirical work, the sustained wind direction changes phenomenon has been historically linked with increased incidences of overhead equipment failures in locations that are more shielded from the prevailing wind directions by natural and/or human-made features, and as such, are less likely to have been recently reinforced, compared to the areas exposed to the more regular wind occurrences.

METSCO understands that both of the above-noted thresholds are employed in addition to regular monitoring of weather warnings and alerts for the relevant service areas.

Long-Term Planning and Standard-Setting Thresholds

Beyond the above-noted anecdotal examples known to METSCO, specific weather-related thresholds in the field of electric utilities are also utilized for the purposes of long-term system resilience planning. In these instances, a utility, a planning authority or a standard-setting association may forecast a number of days over the long-term planning horizon (e.g. next 20-50 years) with expected weather events exceeding certain quantitative thresholds of severity, typically established on the basis of past experience and retrospective analysis of weather data accompanying major interruption events.

One such example is the 2015 joint AECOM/RSI Report "Toronto Hydro-Electric System Limited Climate Change Vulnerability Assessment: Application of the Public Infrastructure Engineering Vulnerability Assessment Protocol to Electrical Distribution Infrastructure."[19] The report contains multiple weather parameter thresholds, which are deemed to pose increased risk of interruption to certain types of overhead and underground equipment.

The study indicates that the thresholds have been derived by way of historical analysis, equipment standards review, and interviews with subject matter experts. However, we note that the public version obtained by METSCO did not contain the appendices that provide the details of the analysis underlying the threshold definitions

The following figure reproduces the specific thresholds for the events analyzed:

Figure 4-7: AECOM/RSI Report Threshold Criteria for Equipment Performance

Weather Type	Relevant Thresholds			
Daily Temperature Maximum	25 °C	30 °C	35 °C	40 °C
High Daily Average Temperature	30 °C	35 °C	40 °C	-
Heat Wave	3 consecutive days with temperature of 30 °C+			
High Night Time Temperature	night time low temperature of 23 °C+			
Freezing Rain (Diameter or Duration)	15 mm	25 mm	60 mm	6+ Hours
High Winds	70 km/h	90 km/h	120 km/h	-
Tornado	Event Force 1+		Event Force 2+	
Lightning	flash density of 1.12+ per km² / year			
Snowfall	days with 5+ cm		days with 10+ cm	

[19] https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/energy-resources/Toronto_Hyrdo-Electric_System_Limited-Climate-Change-Vulnerability-Assessment.pdf

METSCO's understanding on the basis of reviewing the report is that the weather categories where multiple thresholds are displayed (such as temperature) represent the notional cutoff points beyond which the probability and/or impact of subsequent failures increases over the preceding categories. We note that a number of the thresholds used are aligned in their nature and magnitude with the Environment Canada threshold standards described earlier.

In assessing the applicability of particular events and thresholds, the Report in question adopts a "systemic" perspective, wherein each weather phenomenon is potentially seen as being impactful for a particular portion of the system most vulnerable to its influence (e.g. transformation equipment for sustained heat, overhead conductors for wind speeds, etc.).

4.3.3. Operational Assessments of Weather Event Management Efforts

An instructive broad-based threshold of event severity has been in place in the State of New York in the aftermath of the 2012 Hurricane Sandy. The "Emergency Performance Response Scorecard" that has been established by the state Governor following extensive investigations into the impact of Sandy and other similar major events, requires utilities to provide extensive reports on the effectiveness of their efforts to restore normal service after major events.

The results of these reports are organized in a scorecard-like format, where multiple measures, grouped in the higher-order categories, are assigned particular weightings to determine a total composite score, or a rating of a given utility's success in containing and restoring the impact of major weather events. The threshold triggering the reporting obligation is both simple and transparent: if the last outage linked to a given weather event has been restored later than three days after the initial report of weather-related outages, the utility is obligated to file an extensive report, comprised of more than 20 individual metrics. The following graphic provides a condensed version of the scorecard, highlighting the operations- and capital-related categories we see as most relevant for the purposes of this engagement.

Figure 4-8: Select New York State Utility Event Response Effectiveness Measures

Key Categories	What is Being Measured?	Measure Range	Category Weighting
Event Anticipation	Evidence of Employee / Contractor Planning	**Various**	**10%**
	Press Release Issuance		
	Municipal Conference Calls Held		
	Emails / Text Messages Sent		
	Life Support Equipment / Critical Customers Notified		

Key Categories	What is Being Measured?	Measure Range	Category Weighting
	Adequate Inter- and Intra-Utility Information Sharing Procedures Established		
Wires Down Call Response	Average Response Time by Employees and Contractors	**4-12 Hours**	**60%**
Damage Assessment Timelines	Completion Time for 90% of Damage Assessments	**24-72 Hours**	
Crew Availability	Percentage of Forecasted Crews Available Relative to Event's Peak	**From Peak to 48 Hours Post Peak**	
Crew Deployment	Crew Idle Time during Designated Work Hours	**< 1 Hour**	
Estimated Time of Restoration (ETR) Publication Timelines	Time from Event Start when Global, Regional and Local ETRs are Published	**< 24-48 Hours**	
ETR Accuracy	Margin of Accuracy for ETRs	**+/- 6, 12, 24, 48 Hours**	
Communication Measures	Multiple Measures (e.g. Answer Call Rates, Municipal Briefings).	**Various**	**30%**

Our inclusion of this particular framework in the context of search for threshold-based operating and capital performance metrics may not be apparent, since it does not include any such metrics aside from the high-level three-day reporting threshold. However, we do so in an effort to illustrate two findings. First is the sole fact of absence of weather-based thresholds in what we understand to be considered one of the most comprehensive performance reporting frameworks to date.[20] Second, and perhaps more instructive to our research endeavor, are the type of operating measures that are included. Most, if not all, of them are geared towards measuring a utility's performance in managing and liquidating the *impact* of an event, notwithstanding the specific climatic factors that combined to cause it.

Having reviewed the practices across more than a dozen of other jurisdictions, we found no directly relevant precedents where system- or equipment-specific performance effectiveness is measured in the context of a particular weather-related threshold. In attempting to substantiate our lack of findings we turned to scientific and policy literature that examines weather and climate change in a holistic manner – beyond a single industry or human activity area. Reviewing our findings in the context of insights obtained from sources like the Intergovernmental Panel on Climate Change, it is our observation that the lack of specific

[20] For the full list of metrics comprising the New York framework visit http://www3.dps.ny.gov/W/PSCWeb.nsf/All/F2791D3C4CA0925D85257B5700680B03?OpenDocument

weather performance measurement thresholds is a function of conceptual difficulties of defining such thresholds in the context of the following three considerations:

(a) ***Not all severe or extreme weather events (in a statistical sense) lead to significant impact on society.*** At the same time, events that are not statistically extreme can be more impactful depending on exposure and vulnerability of affected systems or communities.[21]

(b) ***Impact (e.g. outages) during a given event can be caused by a variety of weather phenomena, both acting independently and in conjunction with others.***[22] For instance, in 2013, Toronto Hydro's distribution system experienced Major Event Days both in July and December,[23] owing, to a severe summer rainstorm and an ice storm that primarily affected the underground and overhead systems respectively.

(c) ***A changing climate leads to changes in the frequency, intensity, duration, and timing of extreme weather events***,[24] thereby consistently redefining the threshold of what constitutes an extreme occurrence.

In light of these considerations, our limited findings of particular standards of system/equipment performance tied to weather thresholds appears somewhat less surprising, given the practical considerations of capturing all potential causal criteria into a comprehensive and universally applicable standard, and the constantly rising threshold of weather event outliers. Importantly, these insights are consistent with the letter and intent of the IEEE 1366 standard, widely adopted in the electricity industry as a measure of defining the thresholds for Major Event Days (MEDs). Instead of defining thresholds in terms of nature and severity of the phenomena causing outages – the IEEE standard defines MEDs in terms of impact that successive events cause.

The standard itself uses statistical probability distribution of event occurrences, to define a threshold in terms of likelihood of a given event's impact given the past experience, along with establishing criteria relating to a given event's predictability, preventability and controllability. Given that the IEEE 1366 threshold is based on probability of an event of particular impact relative to the events experienced in the past, the MED threshold for subsequent events automatically rises with each incremental event that meets the criteria, thereby incenting utilities to enhance their system resilience following each major event. As such, even though MED events are typically caused by severe weather phenomena, the standard does not include any particular weather event parameters, such as those used by Environment Canada to issue alerts and warnings

Having defined an event itself in terms of severity of its impact on customers (rather than the forces that caused it), the IEEE 1366 standard enables utilities and regulators to measure their

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[21] https://www.ipcc.ch/pdf/special-reports/srex/SREX_Full_Report.pdf p. 33
[22] http://empslocal.ex.ac.uk/people/staff/dbs202/publications/2008/extremes.pdf p. 13
[23] https://www.oeb.ca/documents/scorecard/2013/Scorecard%20-%20Toronto%20Hydro-Electric%20System%20Limited.pdf
[24] https://www.ipcc.ch/pdf/special-reports/srex/SREX_Full_Report.pdf p.7

efforts in terms of addressing this impact – with measures typically focused on the timing and success of restoration efforts to affected customers (e.g. time to restore 25%, 50%, etc.), as well as performance effectiveness of particular utility functions (restoration time estimate communications, call centre processing times, etc.).

4.3.4. Broader Metrics of Severe Weather Event Mitigation

The manner in which utilities prevent, manage and rectify the impact of major weather events is the predominant theme underlying other performance metrics related to weather events we encountered in our search. Willis and Loa (2015)[25] provide a helpful framework for classifying weather resilience metrics according to the nature of the actual factors being measured.

Figure 4-9: Weather Resilience Measure Classification Framework (*Reproduced and modified from Willis and Loa, 2015*).

Weather Event Resilience Measure Classification Framework

Operational Perspective →

← Strategic Perspective

Inputs	Capacity	Capabilities	Performance	Outcomes
What Resources are Available?	*How Are Inputs Organized?*	*What Tasks Can be Performed?*	*Which Operating Aspects are Targeted?*	*What Outcomes are Attained?*
Examples:	**Examples:**	**Examples:**	**Examples:**	**Examples:**
Type & Detail Level of Budgets	Type and Number of Teams	Outage Detection Capabilities	Efficiency Improvement	Reduced Outage Restoration Costs
# of Workers	Mutual Aid Agreements	Redundnacies Available	Reliability Improvement	Increased Economic Activity
# of Spare Parts	Control Centre Processes	Standby Generation Available	System Resilience Enhancement	Increased Socital Welfare

Inputs metrics track the physical or financial units of resources available for utilization during weather event days, including amounts of special budgetary provisions, number of staff trained in key disaster response functions, the volumes of inventories for critical spares and arrangements for replenishing them during emergencies, number and type of special vehicles and equipment, etc.

Capacity metrics assess the organizational aspects of how the key inputs of weather response processes are organized, maintained in ready state and leveraged during emergencies. These metrics examine the manner of personnel organization into discrete units and the frameworks that govern their interaction, the form of other key processes for governing utility operations

[25] https://www.rand.org/pubs/research_reports/RR883.html

during major events (e.g. The Incident Command Framework), and the agreements and processes put in place for cooperation with other organizations, among others.

Capabilities metrics assess the scope, nature and robustness of the actual tools, systems and equipment the utilities have in place to leverage during the major weather events. These include the breadth and sophistication of advanced metering / smart grid capabilities, the extent of availability of system redundancies, backup generation, etc.

Performance metrics are concerned with the efficiency and effectiveness of utilities' actual performance during the event days (which is, arguably, determined by the state of the Inputs, Capacities and Capabilities measured in the preceding categories). This is the grouping most commonly understood as performance measurement in the context of Ontario utility regulation.

Finally, the ***Outcomes*** metrics assess the broader impact of utility performance on the economic and social welfare of the utility itself, its customers and the society as a whole. Tracked within this group are the changes and/or degree of avoidance in costs of restoration, direct and indirect economic impact sustained by customers and partner organizations, reduction of damage, and other related measures.

Of the five categories, the final two (Performance and Outcomes) appear most relevant to the scope of our current engagement, given the manner in which the OEB articulates its guidance on utility performance measures. We note, however, that all five categories represent valid and important aspects of measurement – both within and outside of a given utility. As we discuss earlier, a utility' ability to deliver a given outcome in the context of storm response is ultimately a function of inputs, the manner of their organization, along with their cost implications. Accordingly, explicit tracking of these outcomes enables visibility into the state of utilities' emergency preparedness and particularly the financial and operational trade-off decisions they face. Figure 4-10 captures a subset of operational effectiveness / outcomes metrics related to weather events that METSCO identified in the course of our research. While none of these metrics are introduced in the context of a particular weather threshold, we see their definitions as being potentially compatible with the "before" and "after" comparisons inherent in threshold-based measurement. These measures are:

Figure 4-10: Select Measures Amenable to "Threshold-Based" Definitions

Measure	Description	Key Assessment Factor
Load Not Served (MW)	Measures propose to track difference in inmpact between "baseline" and "improved" system design / condition parameters over time, using a consistent definition of a threshold event	Overall economic outcomes for the utility
Added Operating Cost ($M)		
Lost Regular Labour (people hours)		
Mean Time to Repair an Overhead / Underground Line Segment (hours)	$\frac{Total\ Repair\ Time\ on\ Line\ Infrastructure}{\#\ of\ Afefcted\ Line\ Segments\ per\ Event}$	Operating effectiveness improvements
Permanent Failure Rate (%) vs. Temporary (Repairable) Failure Rate of Damaged Overgead and Underground Equiment	$\frac{\#\ of\ Segments\ w.\ Permanent\ Failures}{Total\ \#\ of\ Segment\ Failures\ per\ Event}$	Long-term capital efficiency (increasing equipment's lifespan despite failures)
Customers Experiencing Longest Interruption Durations (CELID, # of customers)	Measures the number of customers per event that meets the threshold magnitude who experience outages beyond a particular length	Customers experiencing extreme inconvenience due to outages

Although the preceding list is relatively brief, it reflects the fact that most of the metrics that METSCO encountered in part of our research are either sufficiently similar to those already in use in Ontario (e.g. SAIDI/SAIFI, activity-based unit costs), or are more relevant to the Inputs/Capabilities/Capacity-related strategic considerations that are generally outside of the scope of our engagement.

On the other hand, the preceding list depicts the measures that we see as both relevant in the context of current OEB discourse, and incremental in terms of granularity and specificity relative to the metrics deployed today. In making this observation, we are cognizant of the fact that most of these measures would require enhancements to the existing IT capabilities and operating processes more generally. Notwithstanding this reality, we present them for Kingston Hydro's consideration as a potential input into the longer-term operational capabilities planning processes.

4.3.5. Implications of METSCO's Weather Metrics Research Insights

As the preceding discussion illustrates, METSCO did not find any practical examples of utilities, regulators or system operators tracking performance of assets of systems in relation to a particular weather threshold. As stated earlier, we hypothesize that the observed lack of such measures may stem from practical difficulties with determining thresholds that are consistently relevant in relation to the type and extent of damage caused, particularly in the context of the increasing frequency of impactful weather events over time. In light of these observations, the industry as a whole appears to focus on measuring the impact of such events, along with the utilities' practical ability to prepare for and rectify this impact as efficiently as possible.

Notwithstanding the lack of directly applicable examples, we did locate the examples of thresholds being used for the purpose of same-day operational planning and long-term capital strategy and standard development. Moreover, nothing in our review would suggest that threshold-based performance measurement is either impossible or impractical to the point of being ill-advised.

For instance, Stephenson (2008), suggests that thresholds for extreme weather analysis and related performance tracking can be grounded in generally accepted absolute criteria for poor weather (e.g. those similar to Environment Canada threshold alerts), or relative criteria such as weather parameters that represent a particular percentile within a running sample of temperature, wind speed, or precipitation data. Acharya (2005), proposes a three-state weather model ("Normal", "Adverse" and "Extreme" within each year) based on relative frequency of occurrences and duration of events within a given year, to account for the reality that most systems are not designed to withstand the events of certain severity. In both cases, the authors suggest that threshold selection be grounded in statistical analysis of sufficient quantities of relevant performance data.

In light of these considerations and recognizing Kingston Hydro's commitments to investigate threshold-based weather metrics as a part of their Final Settlement, METSCO constructed potential threshold measures and evaluated the utility's past performance in the context of these metrics using its actual reliability performance statistics and the publicly available Environment Canada weather data for its service territory. We provide the summary of our findings and recommendations in this area in section 7 along with other recommended measures.

4.4. Overall Industry Scan Conclusions

Having reviewed the practical examples of operating and capital related metrics (including those related to severe weather events) across a number of jurisdictions, we find that the greatest consistency appears to exist in relation to tracking of reliability. This is not altogether surprising, given that indices like SAIDI and SAIFI have been broadly in use for several decades, and are well understood and accepted by industry participants.

While we found some examples of cost metrics unitized over a high-level form of an "output" such as total number of connections, kWh deliveries, or a particular type of work, we note that most of these examples come from New Zealand and the United Kingdom, where the overall level of data availability to utilities appears to be substantially ahead of Ontario's, as evidenced by a degree of detail in metrics related to asset health / condition. To our knowledge, Hydro One remains the only Ontario utility that has explicitly presented unit cost metrics for discrete asset classes in the context of both transmission and distribution businesses.

METSCO acknowledges these examples and the insights they may be able to generate in the particular setting where they are used. However, we maintain our position that broad (or "gross" – as we refer to them) unit cost measures offer limited managerial insights, given the number of cost factors unrelated to operational efficiency that they encompass.

This is particularly salient in the context of cross-utility comparisons, where a review of unitized metrics derived from unadjusted cost categories can lead to problematic inferences regarding one utility's efficiency relative to others'. However, these unadjusted comparisons are also problematic for year-over-year comparisons of a single utility's results, as annual changes (be they positive or negative), can be grounded in factors that are not related to operational efficiency per se. Most importantly, tracking of such metrics does not provide the utility or its regulator with operationally meaningful insights as to the scope, scale, and nature of opportunities inherent in the differential cost positions implied by comparisons.

Our best practices scan references an alternative methodology for the derivation of unit costs that isolate efficiency-related cost factors from those related to the utility's strategic decisions, and scale-based considerations. While we present this methodology for Kingston Hydro's consideration, we do not encourage the utility to adopt it at this time, given that it has received no scrutiny in the context of Ontario's utilities sector, the requisite effort underlying its adoption, and the granularity of Kingston Hydro's legacy data systems.

METSCO does, however, encourage Kingston Hydro to consider adopting a Value Chain-based analysis of cost tracking for one or more types of assets, to track whether and how the relative contributions to an asset's final installed cots change year to year across the various value chain stages – from materials procurement through to field installation. This tracking methodology could provide Kingston Hydro with more actionable and operationally relevant insights than aggregate-level unit cost tracking, while also advancing the granularity at which the utility examines the input units and implementation processes underlying its capital work program.

Beyond unit costing, our jurisdictional scan highlighted several higher-level metrics aimed at exploring the capital-maintenance interplay, and/or reduction of reactive maintenance expenditures overall. Given the emphasis that the Ontario Energy Board has placed on this issue area in recent years, and the generally high level of tracking of maintenance expenditures at Kingston Hydro to date, we believe that this area may present a potential opportunity for where the utility can explore more granular tracking. In making this observation, however, we are cognizant of the fact that the Distribution System Code contains a number of prescriptive provisions regarding the minimal maintenance cycles obligations that all utilities must meet.

While we expect this to limit the opportunities for potential cost improvements, we do see merit in Kingston Hydro exploring the area of planned vs. unplanned maintenance in more detail, given the manner in which the maintenance expenditures have been tracked prior to the recent introduction of the new Financial Management System.

Of all the jurisdictions examined, New Zealand and the United Kingdom stand out as an example with the greatest diversity and sophistication of capital metrics tracked, particularly in the area of asset condition. While it represents a notable example to emulate in the future, we note that this level of capabilities reflects an outcome of concerted effort to collect detailed information over a number of years. To enable this end state (or for that matter, any advanced asset management capability mandating data or system enhancements), METSCO believes that it is both useful and reasonable to track a utility's progression towards such objectives as a measure in itself.

While tracking such measures would not amount to tracking outcomes, it would showcase meaningful progress towards the operational state where new and improved outcomes could become feasible. Of note is the fact that our discussion of severe weather-related metrics highlights the examples of Input- or Capacity- or Capability-related metrics, aimed at enabling preparedness and continuous improvement in the areas where improvement opportunities exist. Accordingly, our ultimate list of recommendations reflects a number of metrics related to the utility's planned or ongoing efforts to enhance its capabilities in areas related to capital and maintenance planning and execution.

Finally, with respect to severe weather-related metrics, we see significant focus on measures exploring preparedness planning and restoration efforts to events according to the severity of their impact, rather than strength of particular weather factors that caused them. However, in light of Kingston Hydro's commitments in its CIR Final Settlement, we explore the possibility of establishing utility specific weather severity thresholds in the following sections.

5. Results of METSCO's Review of Kingston Hydro's Operations and Weather-Related Performance

5.1. Overview

Utilities Kingston (UK), affiliate of Kingston Hydro (KH), operates a 44- and 5-kV system, 67% of which is made up of overhead assets. The system is looped in its design (a source of historical efficiencies), but features several challenging subsystems, including extensive rear-lot service area and a downtown underground secondary network. Kingston Hydro serves approximately 27,500 customers, about 88% of which are residential. The utility's service area is 36 km^2, making it a distributor with the second highest customer density by service area kilometers among all Ontario utilities.[26]

Kingston Hydro is connected to both Hydro One's transmission and distribution systems at western and eastern ends of its service territory. The utility itself serves a number of large customers including Canadian Forces Base (CFB) Kingston, Queen's University, and a number of institutional customers, including federal and provincial government offices and facilities, educational establishments and various industrial operations.

While load growth has been modest over the past decade, Kingston Hydro's most recent engagements with key customers highlight potential growth plans that may put more pressure on station capacity in parts of the system in the coming years. Like many mature distribution utilities in Ontario, System Renewal has been the major investment driver over the past decade, followed by System Access investments to enable connection of new developments.

In an arrangement that is distinct from other Ontario distribution companies, Kingston Hydro operates as a part of an integrated "Multi-Utility Model" where the municipal electricity, natural gas, water and wastewater services, commonly known as Utilities Kingston (UK) share a number of key capabilities, including the engineering work, a customer call centre, an operations control centre, billing and collections departments, and procurement and facilities functions, among others.

METSCO's engagement included ten on-site interviews, along with 20+ hours of follow-up telephone discussions with Kingston Hydro's staff and senior management employed in and accountable for the following functions:

- Engineering / Asset Management;
- Field Operations and Capital Construction;
- Control Centre and Dispatch;
- Supply Chain and Warehousing;
- Regulatory Affairs
- Finance and Strategy

[26] OEB 2016 Yearbook of Electric Distributors Data

- Fleet and Facilities;
- Metering, Customer Care and Key Accounts.

In our interviews, we sought to engage a variety of employees, ranging from front-line professionals to Vice Presidents. We dedicated the vast majority of our inquiries to matters surrounding capital and maintenance planning and execution matters. In the course of our engagement, METSCO also reviewed a variety of internal documents, including operational manuals and reference documents, strategic plans, financial databases of capital and maintenance work records, reliability tracking information, pricing schedules, and many others.

The following discussion contains our key insights with respect to the areas most pertinent to the scope of our engagement – namely the development of custom DSP metrics.

5.2. Asset Management and Operations Functions

5.2.1. Capital Planning Approach

Over the past decade, Kingston Hydro has approached its capital renewal activities in stages, prioritizing a particular subsystem or a given asset class on the basis of factors like the state of equipment repair, age, outage occurrences, and/or operating and safety risks. Having addressed a number of deteriorated underground vaults and the related equipment over the last decade, Kingston Hydro is now focusing on renewal of its overhead distribution system, and two large standalone projects – the first phase of the Municipal Station 1 expansion (with the second phase planned for the next incentive regulation period) and the final phase of the Princess St. Revitalization Project.

Upon substantial completion of the capital work in these three priority areas (which collectively represent over 60% of the currently approved DSP spend), Kingston Hydro anticipates to target the underground cable infrastructure as the next major driver of its capital renewal. The underground system is reportedly showing increasing signs of deterioration and outage incidence. In multiple cases, the redundancies inherent in the looped design of the utility's system have enabled Kingston Hydro to restore supply and reconfigure the system without undertaking costly emergency repairs to the underground system in the short term. However, as the load requirements gradually increase, the amount of redundancies available to the system operators is decreasing, necessitating underground system repairs to manage outage risks and maintain requisite operating flexibility.

While METSCO was not mandated to review and/or comment on the effectiveness of Kingston Hydro's planning processes, our general observation is that a structured approach of prioritizing particular asset classes or subsystems over successive planning horizons, as Kingston Hydro has done, represents a clear and effective way to address system renewal. Doing so enables the utility to capitalize on the incremental planning and implementation insights gained through planning and implementation, and potentially leverage materials/equipment procurement efficiencies.

In our impression, Kingston Hydro is keenly aware of the value of continuous improvement, and consistently dedicates some Engineering and Operations staff time to what can be generally described as proactive review of industry best practices – to advance the understanding of major issues affecting its system and explore industry best practices for resolving them. We cite the examples of such initiative throughout the following sections of this document.

Also indicative of the utility's quest for continuous improvement are the sequential enhancements of the utility's asset analytics capabilities and the ensuing understanding of the issues affecting its system. Over the course of the last decade, Kingston Hydro's asset management IT capabilities have evolved from a "Priority Database" spreadsheet that tracked the individual equipment issues identified during the course of inspections, to a comprehensive and GIS-integrated Asset Registry that tracks performance information for all assets across a number of relevant categories.

Over the last three years, the Asset Registry has also been continuously populated with asset condition data on wood poles, using a Health Index methodology developed by Kinectrics. Future plans include the integration of the Asset Registry capability with the OMS/SCADA data, to further enhance the amount of information available to system operators and asset managers for both reactive and long-term planning work.

METSCO also understands that Kingston Hydro has been making efforts to explore on a limited basis the Tan-Delta (also known as the Loss Angle and Dissipation Factor) approach to testing underground cables, which enables utilities to prioritize among potential cable replacement projects on the basis of failure risk established through diagnostics. We note that Kingston Hydro's choice of this particular new area of exploration among many potential competencies is consistent with its future plans to target underground cable replacements as the next major frontier of its capital renewal program.

5.2.2. Capital Budgeting, Cost Estimation and Project Cost Governance

Based on the insights obtained through interviews with staff and senior executives, Kingston Hydro appears to be highly disciplined in its approach to capital and maintenance expenditure management, utilizing robust top-down spending constraints and extensive ongoing controls by subject matter experts. The utility's executive establishes a single combined top-down budgetary envelope for capital and maintenance expenditures, covering both planned and reactive work. The Engineering and System Operations teams then work together to allocate the total budgeted amount across the planned capital project scopes and regular maintenance activities, with a provision for reactive work and customer-specific work volumes forecasted on the basis of past experience.

Where emerging priorities (e.g. additional customer requests or higher volumes of reactive work) mandate reactive spend allocations beyond the anticipated amounts, the total annual budget remains unchanged, while planned projects may be de-prioritized and/or rescoped to remain within a budgeted amount. In general, Kingston Hydro's Executive does not entertain possibilities of in-year increases to the overall spending envelope, thereby requiring its management to work within constraints of a hard expenditure cap. While this leads to a stable and predictable expenditures management process from a utility-wide perspective, we note that Kingston Hydro's current financial and operational management processes do not currently incorporate dedicated monitoring of amounts spent on planned vs. reactive capital and maintenance expenditures.

Project-specific work execution labour cost management is tracked by way of regular electronic time sheets. A dedicated Project Manager tracks expenditure progress on a weekly basis and alerts key management personnel as soon as they notice any anomalies. The relatively small number of discrete annual projects (75-100) enables strict control and individual project-level attention by key management team members, empowered to investigate any unanticipated issues and authorize subsequent courses of action. Project-specific information is entered into the company's financial system, to enable periodic reporting as per the internal reporting needs and OEB requirements.

A recently implemented upgrade to the utility's financial system appears to be well-suited for detailed examination of project/program-specific data, once it is fully integrated with the utility's operating processes. At present, however, Kingston Hydro's legacy work completion records are not optimally suited to conduct a detailed assessment of past expenditures on the basis of individual unit and labour activity types, quantities and related information that would facilitate the development of asset class-specific and/or unit-based performance measures on the basis of past expenditures. In making this assessment, we observe that the current systems that track program- and project-specific expenditures are comparable to those employed by other Ontario distributors and are adequate for generating reporting information at the level of detail required by the OEB. Notwithstanding the sufficiency of the current systems to meet the current regulatory reporting requirements, Kingston Hydro's management is aware of the benefits of more granular information tracking and cite the desire to acquire these capabilities among the drivers for the ongoing implementation of the new financial system.

METSCO found Kingston Hydro to be effective in integrating its planning, design, and work execution functions, using regular consultative meetings in preparation of project scopes and designs. All project-specific costs estimates are jointly developed by the Engineering, Operations and Control Centre staff on the basis of zero-based budgeting, utilizing available asset condition and system information, current materials and equipment cost schedules maintained by the Supply Chain team, relevant past project cost reports, and the individual subject matter experts' knowledge of the operating areas in question.

The project costs estimates used for operations planning and OEB rate application are developed by a single team of experts, who are also directly involved in monitoring these projects' eventual execution. As such, Kingston Hydro's capital cost estimates are largely unaffected by the issue of variances between the plan-level and project design-level cost estimate assumptions that exist in some of the larger utilities, whose annual project volumes mandate a multi-stage estimation process involving different groups of professionals.

Notwithstanding the positive aspects of the project planning and cost estimation, these activities do not currently utilize any formally governed standard asset-specific labour cost inputs that could be used as a starting point for the development of a particular cost estimate, and subsequently refined on the basis of actual project results. Use of centrally governed and periodically revisited labour cost planning inputs could enable Kingston Hydro to continuously improve the precision of its planning process, track crew productivity and/or special costing considerations applicable to specific task types and facilitate effective knowledge transfer between experienced staff and newer hires.

Although we commend the cohesion of Kingston Hydro's coordination of project planning activities between Engineering and Operations staff, we note that this process does not currently involve representatives from the utility's Procurement / Supply Chain function. METSCO believes that integration of a Supply Chain SME's participation into the current process would amount to a relatively simple and effective process enhancement. We especially suggest that Kingston Hydro explore this recommendation in light of several anecdotal examples of construction crews failing to notify the warehouse staff in time of the need for particular materials and equipment, reportedly resulting in the occasional need to execute rush orders and re-prioritize crew work planned for the day.

5.2.3. Operating and Capital Construction Processes

Operating Activities

From our discussions with Kingston Hydro, we understand that a material source of its operating efficiencies comes from a unique in Ontario multi-utility operating model, where the bulk of administrative overhead, facilities, fleet, underground locates, warehouse and engineering staff expenses are shared among the hydro, gas, and water/wastewater utilities that comprise Utilities Kingston. METSCO understands that the cost allocation method received scrutiny from the OEB and intervenors in the context of the utility's last CIR application. While our interviews with Kingston Hydro staff highlighted a number of instances where the multi-utility model appears to drive meaningful cost synergies that benefit Kingston Hydro and its customers, the scope of our engagement did not include review or validation of the value proposition that the multi-utility arrangement provides.

Beyond the multi-utility model, staff across functions and seniority levels are open to process improvements (including measurement), provided they align with the utility's needs and are justified in terms of implementation costs and benefits. Among the initiatives already underway that can be expected to lead to improvements in capital asset management and maintenance, is the ongoing work to develop and implement an Outage Management System (OMS) solution over the next two-three years.

By integrating an OMS Into its operating practices, Kingston Hydro expects to further enhance the speed of its access to detailed information regarding the timing, impact and restoration efforts of system outages, as well as enable proactive simulation of scheduled outages to determine their impact and select the most optimal switching sequences. Over time, the utility also plans to integrate the OMS data with its GIS system and the Asset Registry capabilities, both of which contain information regarding the operating characteristics and condition of the utility's assets.

In discussions with METSCO, Kingston Hydro officials also acknowledged the possibility of integrating the "Last Gasp Signal" technology available in its smart meters with the OMS system, thereby increasing the speed and accuracy of outage identification. While METSCO sees a number of potential benefits associated with this initiative, we observe that Kingston Hydro's employees that we spoke to had varying views as to the key benefits targeted by the OMS project, potentially suggesting that project benefits had not been as clearly articulated by management as they could have been.

A notable recent change to operating practices came from adopting more aggressive Vegetation Management practices starting in 2014. The new program involves more extensive trimming of branches in the areas neighboring the overhead circuits in an effort to reduce the instances of tree-related outages, to improve reliability and limit the number of trouble calls. We understand that the incremental cost of this approach is not significant in comparison to the benefits that the utility derives from these initiatives. METSCO sees this as a potentially promising endeavor, particularly in light of the fact that as much as 40% of Kingston Hydro's overhead system is comprised of rear-lot overhead services, which feature extensive vegetation and present access difficulties for restoration efforts particularly during the poor weather season. We explore the potential impact of this initiative further in our discussion of recommended weather-related measures.

With respect to scheduling capital construction work that involves road or laneway closures – particularly work involving road or laneway closures – Kingston Hydro reports a high degree of coordination with other municipal services and/or relevant private sector parties with underground assets. Effective coordination of work that involves significant costs (e.g. cuts, excavation, resealing) and interruptions to the normal flow of vehicular and pedestrian traffic are both efficient in terms of cost sharing arrangements that they typically involve, limiting the impact of the utility's operations on the everyday functioning of the city and its dwellers, and optimizing the lifecycle costs of public infrastructure more generally.

While Kingston Hydro officials' accounts of the degree of coordination were based on anecdotal evidence, it is METSCO's opinion that the efforts to coordinate the work with other entities that operate on underground infrastructure is at once an example of prudent capital cost management and consideration of impact of utility's everyday activities on the lives of local residents, who are also its customers.

The utility is also taking steps to improve its access to equipment and materials savings by actively exploring joint procurements of common equipment types with a number of other utilities by way of the Utilities Standards Forum (USF) group as well as the GridSmartCity consortium. While at the time of our interviews the discussions were in relatively early form, management saw exploration of a systematized multi-utility procurement framework as a key priority for both Engineering and Supply Chain functions. Outside of common procurements, the Supply Chain function leverages cost sharing benefits provided by the Multi-Utility Model (e.g. a single warehouse, yard, staff), and explores discount opportunities where available.

We note, however, that the warehouse operations presently rely on manual inventory management, staging and picking processes. While Kingston Hydro's management is aware that technologies exist that could enhance the operational effectiveness of its supply chain processes, this area has not deemed a priority to date, relative to other required IT enhancements, such as the implementation of the new Financial Management and Outage Management systems. METSCO sees this as a reasonable prioritization, reflective of a conscious strategic trade-off decision. Notwithstanding this conclusion, we see warehouse operations as a potential candidate area for performance measurement in the course of continuous improvement work.

5.2.4. Capital-Related Activities

In its capital construction activities, Kingston Hydro relies on external third-party contractors for the performance of civil work, such as installation of concrete ducts and excavation of holes ahead of pole replacements. In retaining third party services, the utility uses competitive procurement processes that leverage the insights of previous years' experience of working with contractors. Similarly, Kingston Hydro outsources the execution of vegetation management activities to the City of Kingston, along with specialized technical work required infrequently (such as Paper-Insulated Lead Covered (PILC) underground cable splicing). While the utility has also explored outsourcing the elements of its overhead electrical construction work, it has reportedly found that the use of internal crews was more cost-effective for these purposes.

In terms of capital equipment-specific developments, Kingston Hydro and its customers are reportedly realizing material benefits from the utility's recent replacement of the legacy oil-insulated switches with the more modern gas-insulated switch technology. The new switches enable Kingston Hydro's crews to perform capital and maintenance work on the associated equipment "live" – without the need for prolonged scheduled outages that affected its customers in the past, requiring additional effort in the form of outage notifications and hold-off procedures. We understand that Kingston Hydro has apprised the OEB of these particular benefits in the course of its most recent CIR proceeding and committed to devising performance measures that track their ongoing impact.

Beyond the gas-insulated switches, the extensive replacement / refurbishment program that targeted the utility's underground vaults enabled Kingston Hydro to increase standardization of equipment and enhanced data accuracy on the vault locations and condition. By phasing out some of the older technology used in underground vaults and installing more submersible equipment, Kingston Hydro has also reportedly facilitated the faster, safer, and more cost-effective maintenance of this equipment and the related facilities, while increasing its overall reliability.

A notable source of historical short-term capital efficiencies is inherent in the looped design of Kingston Hydro's system, where supply to a given area can be configured through a number of alternative paths. Over the recent years, Kingston Hydro experienced a number of outages on its underground system, repairing of which would entail significant restoration costs and extensive outages. Leveraging the looped system design where possible, the utility made a strategic decision not to repair the underground system faults in the near-to-medium terms, and instead to re-establish supply to the affected areas by way of the overhead system.

While this approach enabled Kingston Hydro to defer material reactive repair costs in the near term, Kingston Hydro is cognizant that this arrangement mounts to a temporary solution that warrants direct intervention into the underground system in the coming years. METSCO observes that this manner of managing underground system outages is consistent with Kingston Hydro's phased approach to capital renewal, where underground cables represent the next anticipated major focus area, upon the substantial completion of the overhead system renewal work.

To the extent that this near-term measure was informed by diligent consideration of the underlying risks and benefits (which appears to have been the case based on our discussions with Kingston Hydro's staff) METSCO observes that the decision to defer underground system repairs where they are not critical in the near term, is a sensible strategic approach to capital and operating cost pacing and prioritization. Beyond the direct cost deferral benefits, this approach can be seen as enabling the utility to stay the course with its planned capital renewal work, without compromising on stated operating objectives.

5.3. Impact of Poor Weather

The climate within Kingston Hydro's service area is characterized as *Dfb* (Warm-Summer Humid Continental) by the Köppen-Geiger Climate Classification System[27], which corresponds to areas with relatively uniform distribution of precipitation throughout the year, the coldest month averaging below -3 °C, all months with temperature averages below +22 °C, and at least four months with the average temperature above 10 °C. The following table provides select comparative climate parameters between the city of Kingston and the two largest Ontario cities that it is positioned amidst.

Figure 5-1: Select Climatic Data: Kingston, Toronto, Ottawa[28]

Category / City	Kingston	Toronto	Ottawa
Avg Temperature (°C)	**7.6**	9.2	6.3
Avg Wind Speed (km/h)	**32**	33	25
Avg. Annual Rainfall (mm)	**780**	709	733
Avg. Annual Snowfall (cm)	**179**	133	202
Avg. Days of Precipitation per Month	**13.1**	12.1	13.5
Avg. Days w. Freezing Rain / Drizzle per Year	**9**	2	11
Avg. Days w. Thunderstorms per Year	**19**	17	18

[27] https://en.climate-data.org/location/987262/
[28] https://www.theweathernetwork.com/ca/weather/historical-weather/caon0349; https://www.windfinder.com/windstatistics/kingston_ontario

Kingston receives comparatively more annual rainfall and average thunderstorm days per year than both Toronto and Ottawa, and experiences other precipitation-related parameters comparable to Ottawa's. Kingston's average wind speed is comparable to Toronto's and is significantly higher than Ottawa's. Both Kingston and Toronto experience six months a year with average wind speeds above 35 km/h, compared to only one month for Ottawa, although Toronto's winds are more severe with four months of average wind speeds at or above 40 km/h compared to two for Kingston. Of note is also the average of nine days per year with freezing rain or drizzle for Kingston, compared to two for Toronto and 11 for Ottawa.

In discussions with METSCO, Kingston Hydro identified weather events as a significant reliability driver, both as a function of its overhead system that is also surrounded by mature urban canopy, and parts of its underground equipment periodically subjected to water accumulation during rainstorms. Although weather resilience has not been the predominant driver of Kingston Hydro's capital renewal program over the recent decades, improved performance during inclement weather was among the expected outcomes. Moreover, the recently adopted aggressive vegetation trimming program was specifically motivated by improved reliability. While Kingston Hydro's management possessed anecdotal evidence of improving weather resilience as a result of recent capital investments and changes in operating practices, they sought empirical validation of these expected improvements. Moreover, in recognition of its commitments as a part of the Final Settlement, Kingston Hydro requested that METSCO explore the viability of establishing weather parameter-based thresholds for the purposes of measuring its system performance on the going forward basis.

To perform this work, METSCO obtained Kingston Hydro's detailed outage tracking data for 2008-2016 years, along with the Environment Canada's hourly and daily weather statistics for its Kingston weather station for the same time period. In seeking to establish the hypothetical threshold values against which the utility's system performance could be tested, METSCO referred to the Environment Canada and AECOM/RCI weather thresholds described in the Jurisdictional Scan part of this report.

5.3.1. Methodology

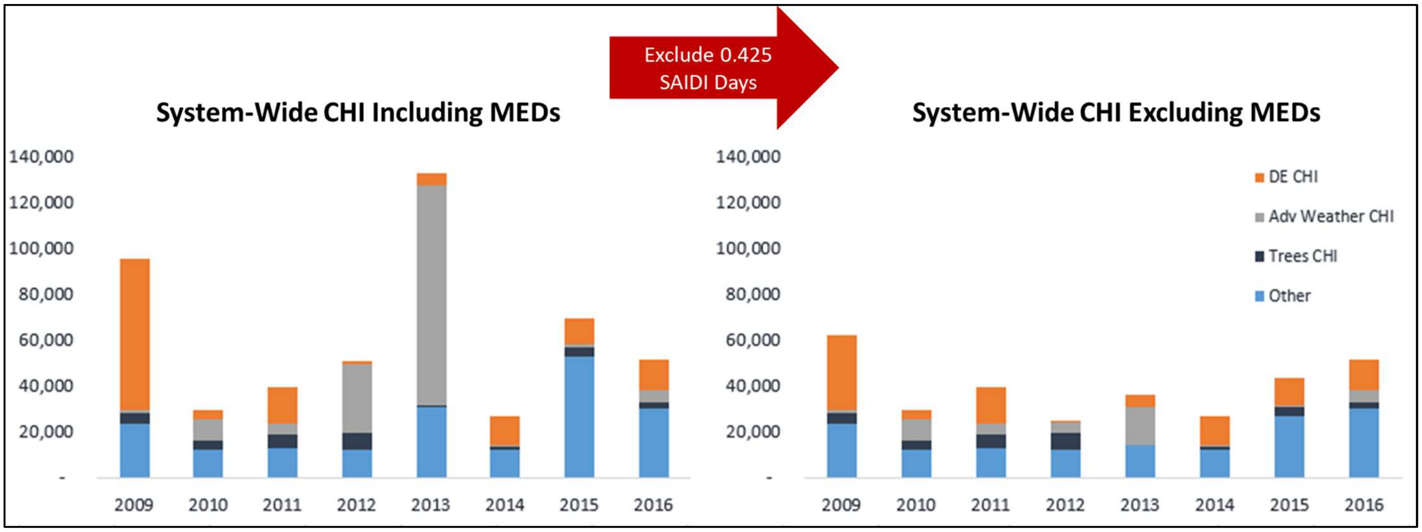
Prior to proceeding with data analysis, METSCO sought to adjust the reliability data for the impact of Major Event Days, to focus our inquiry on severe weather events that did not represent statistical outliers that would significantly skew the analysis. While system disturbances that trigger the IEEE 1366 definition of Major Event Days are themselves usually triggered by poor weather, successive MED events represent statistical outliers by definition, and as such, warrant exclusion from analysis of average weather-related system performance to reveal trends that would otherwise be concealed by the impact of major events.

Using the *2.5 Beta* method[30] consistent with the IEEE 1366-2012 definition, METSCO to stratify the performance data into fair/poor weather days and major event days. Using the 2009-2016 dataset six MED Days annually were identified within the 2.5 Beta cutoff (average daily SAIDI

[30] http://grouper.ieee.org/groups/td/dist/sd/doc/2003-01-Major-Events-Classification-v3.pdf

threshold of 0.425)On these days, Kingston Hydro customers experienced an average of 0.425 hours, or 25.5 minutes of interruption. We subsequently removed the interruption data for these days[31] from our dataset to obtain a more uniform distribution of reliability events desirable for our purposes, and to focus our inquiry on the system's performance during normal operating conditions

Figure 5-2: Impact on CHI of removing reliability data for MED Days. *Note: similar effect holds on the basis of Customers Interrupted (CI) or total number of outages.*

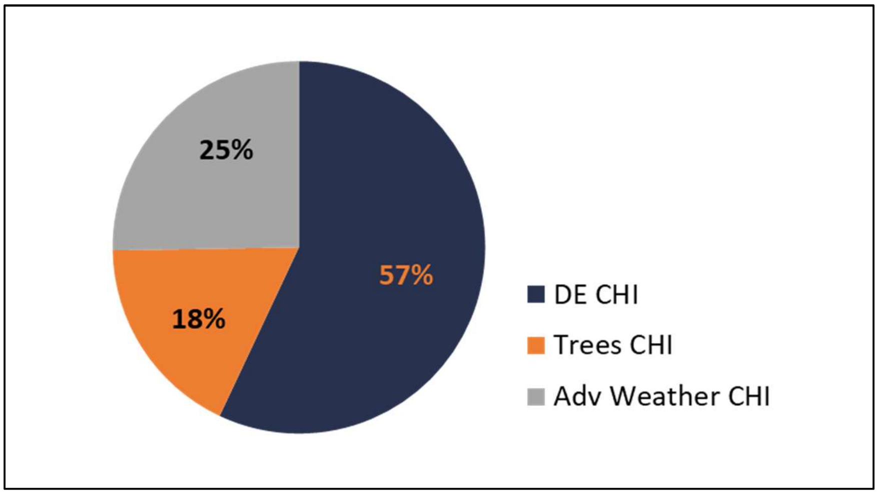


To further focus our analysis of weather-related system performance during poor weather days, we concentrated on the three Outage Cause Codes that can be reasonably associated with equipment performance during inclement weather – namely Defective Equipment (DE), Vegetation (labelled as Trees in the above figure), and Adverse Weather Cause Codes.

Having removed the data associated with other cause codes, our dataset now contained 320 days with positive daily Customer Hours Interrupted (CHI) parameters, broken down between the three cause codes in the manner displayed in Figure 5-2 on the following page.

[31] June 23, 2009, January 12, 2012, December 17, 21 and 22, 2013, and October 27, 2015.

Figure 5-3: CHI Contributions Across the Three Cause Codes Examined.



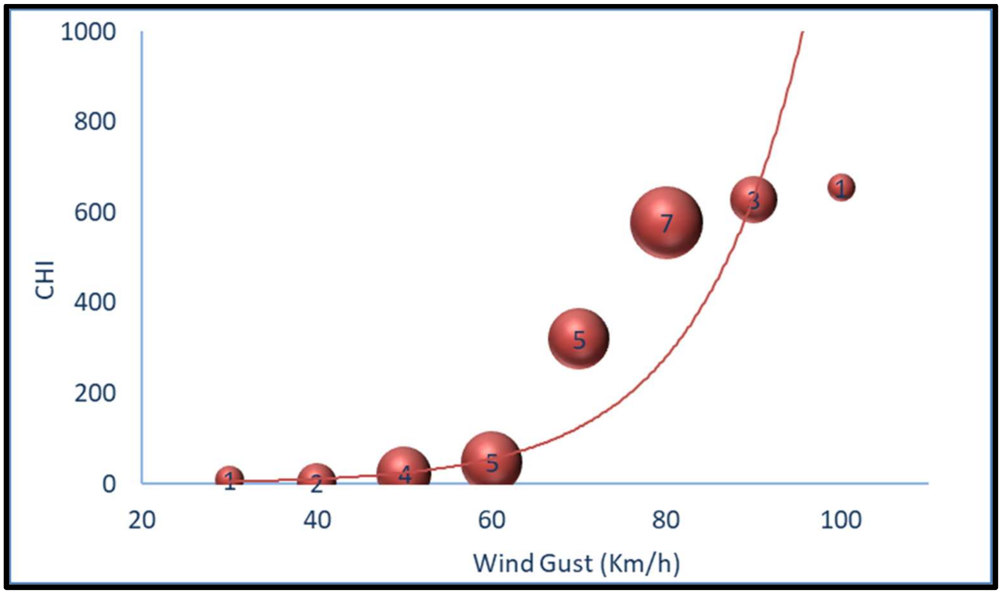
5.3.2. Results

Having completed these adjustments, we set out to test the relationship between the available weather data deemed relevant (total daily precipitation, maximum daily wind gust speed, hourly wind speed, and hourly temperature). While METSCO also sought to analyze the data pertaining to freezing rain and lightning, this information was not available. By way of performing both data visualization and regression analysis (see Appendix), we found meaningful statistical correlations between combined Defective Equipment, Vegetation and Adverse Weather CHI (our MED-adjusted reliability proxy) and the following weather parameters:

- Precipitation (0 mm, 2.5mm, and 25 mm thresholds saw material increases in CHI)
- Wind Gust (maximum daily gusts of 50 km/h and above)
- Wind Speed (sustained two-hour average speed of 50 km/h and above)
- Temperature (below -10 °C and above + 20 °C - when combined with precipitation)

Figure 5-4 below showcases an example of the relationships between weather events and outage severity (CHI) identified through our analysis of 2009-2016 MED-adjusted data. It showcases an exponential relationship between CHI and wind gust speeds, with sizes of bubbles also indicating relative amount of precipitation associated with certain events.

Figure 5-4: Wind Gust and Precipitation Relationship with CHI



Based on our insights regarding relationships between weather phenomena and outage events, METSCO devised a series of potential threshold definitions of what constitutes a "Poor Weather Day." In an effort to provide comprehensive analysis, we constructed multiple definitions on the basis of both single and combined weather factor (that is thresholds triggered by one, vs. multiple weather phenomena).

To test the robustness of our analysis, we also developed two levels of restrictiveness for our thresholds – namely "Mild" definitions with lower thresholds, corresponding to about 50 days a year, and "Strong" thresholds, where the necessary conditions occur only several times per year. The following graphic provides the range of the threshold definitions we tested:

Figure 5-5: Threshold Day Definitions Tested by METSCO

Definition Type	Poor Weather Day Definition (Mild: ~50 threshold days/year)	Poor Weather Day Definition (Strong: ~15 or less threshold days / year)
Single Factor	• Maximum Wind Gust: 50 km/h+ • Precipitation: 0 mm+ • Precipitation: 2.5 mm+	• Maximum Wind Gust: 70 km/h+ • Sustained 2-hour Wind: 50 km/h+ • Precipitation: 25 mm+
Multifactor	• Maximum Wind Gust: 50 km/h+ **OR** Precipitation: 2.5 mm+ • Maximum Wind Gust: 50 km/h+ **AND** Precipitation: 0mm+	• Maximum Wins Gust: 70 km/h **OR** Sustained 2-hour Wind: 50 km/h **OR** Precipitation: 25 mm+ **OR** Summer Temperature: 2 days with daytime 30 C+ and night time Temperature of 20 C+ **OR** Winter Temperature: 2 days with daytime -10 C and night time -15 C

METSCO further tested the validity of our chosen thresholds by comparing the average CHI values for "Poor Weather" days under each of our threshold definitions, relative to the average

CHI values of the "normal days" using three-year running averages to smooth the impact of natural weather-related variability. As showcased in the Appendix in all cases with the exception of the Severe Precipitation (25 mm+) definition, the average three-year running CHI for Poor Weather Days was between two and 90 times higher than the same three-year running average CHI for the Normal Weather days when the particular thresholds have not been met. This finding validated the practical and managerial significance of our chosen thresholds, since they represent the days when Kingston Hydro customers experience on average a materially worse reliability than during the days when during the other days.

Using simple and three-year running average trending analysis, we also established that the total frequency of occurrence of threshold days has either stayed consistent, increased or declined slightly in the case of events related to precipitation (see Appendix). In other words, before testing whether Kingston Hydro's reliability performance has improved on the days satisfying our weather-related thresholds, we determined that the frequency of occurrence for such events has stayed relatively consistent over the eight years of our analysis, and that the relative reliability impact during these days is higher than the corresponding impact during all other days. This ensures that our threshold values are both impactful and are occurring with relative stability throughout our eight-year analysis period.

Having completed the tasks described above, we were in a position to test whether and to what extent Kingston Hydro's reliability performance within the three Cause Codes of interest has improved on Poor Weather days across our threshold definitions.

Figure 5-6 on the following page presents our findings for both Mild and Strong threshold definitions on a three-year moving average basis to highlight the observed trends emerging over time.[32]

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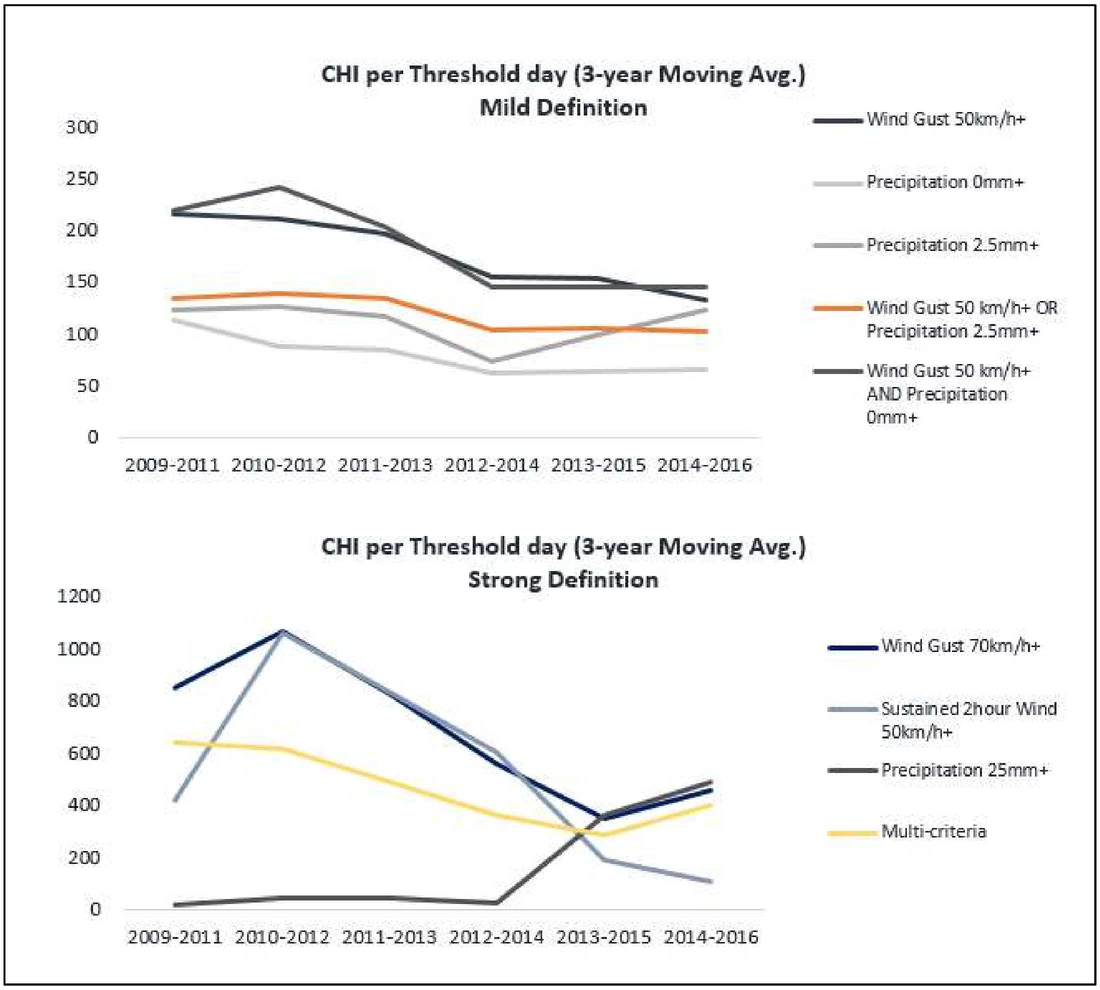
[32] Appendix contains the same graphs presented on a year-over-year basis where downward trends are also observed but are more difficult to discern given the natural year-over year fluctuations typical of weather events.

Figure 5-6: Customer Hours Interrupted (CHI) Moving Average for Threshold Event Days

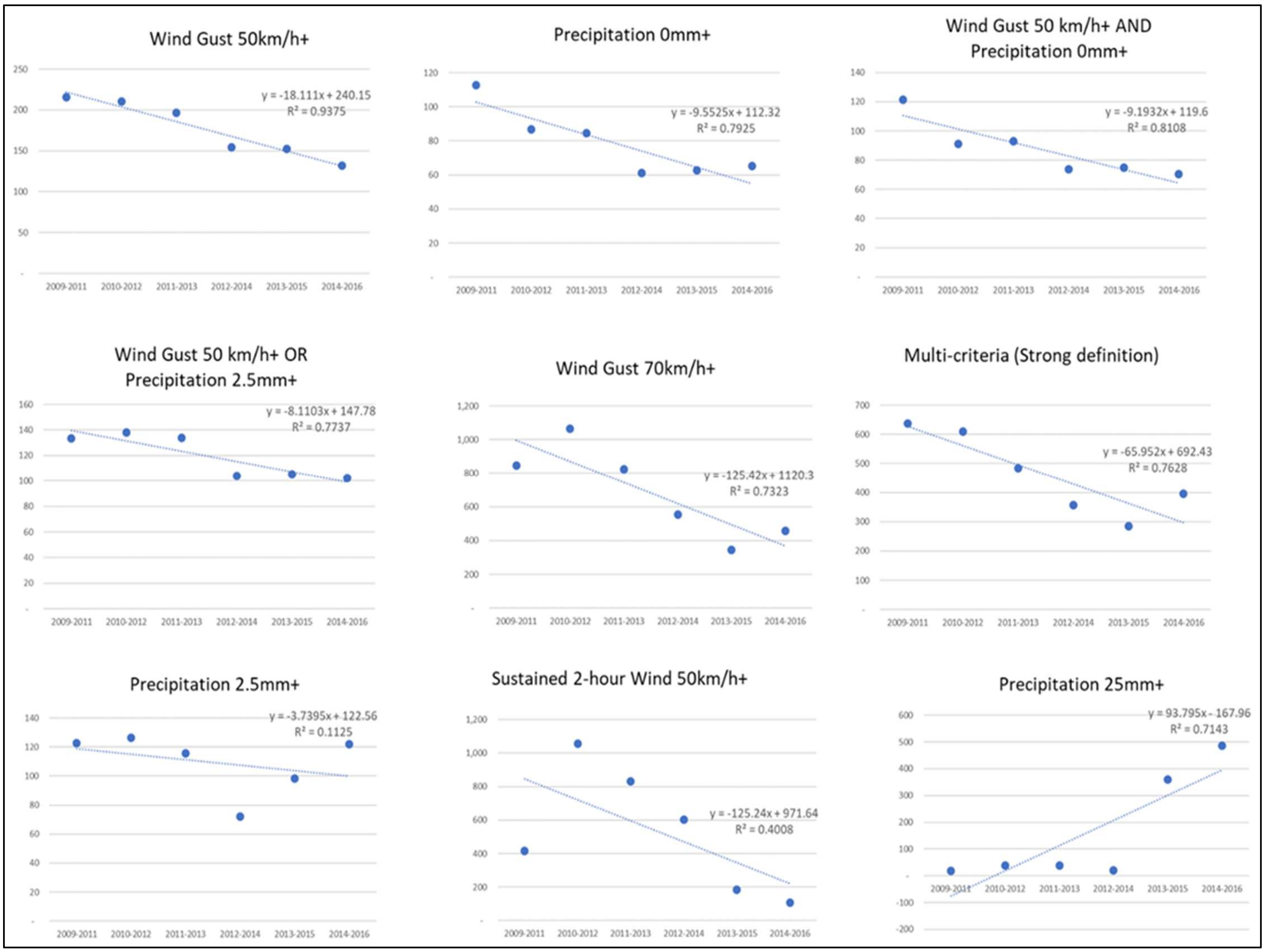


As the above figure indicates, in all cases with the exception of Precipitation above 25mm+ definition, Kingston Hydro's Poor Weather CHI is reducing – suggesting improved weather resilience over time, as capital renewal continues and new vegetation management practices take hold. Appendix confirms that similarly shaped trends are observable when the measurement is performed on the basis of Customer Interruptions (CI) and Number of Outages, rather than CHI.

While METSCO is not in a position to speculate as to the reasons for the recent decline in reliability performance on days with higher rainfall, one possible explanation could stem from the fact that Kingston Hydro has predominantly focused on overhead infrastructure renewal over the period we examined, while major rainfall events are more likely to affect underground and/or stations infrastructure (by ways of flooding). While this is only a hypothesis, we encourage Kingston Hydro to examine it in greater detail.

As a final step, METSCO confirmed the observed improvement in Kingston Hydro's reliability performance on poor weather by way of regression analysis. The following charts indicate the clearly declining trends for all but the variables with the most robust R-squared results. We note the example of 25 mm+ precipitation, once again indicating an increasing trend, with a reasonably strong R-squared of 0.71 – lending further support to our suggestion that Kingston Hydro explore this issue further.

Figure 5-7: Regression Analysis Results - Three-Year Running Average CHI during Poor Weather Event Days



As the preceding analysis indicates, Kingston Hydro's reliability performance in relation to weather-related events has shown statistically significant signs of improvement across a number of different threshold definitions of poor weather. METSCO notes that the threshold definitions that we tested were consistent with those used by Environment Canada and outlined for the long-term planning purposes in the AECOM / RSI Toronto Hydro report, providing a degree of industry practices-based validation to our empirical findings.

Importantly, the robust R-squared results derived for the majority of threshold values in in the final step of our analysis also suggest the possibility of constructing reasonably robust variables for the purposes of tracking going forward. We recommend several of these variables in the Recommendations section.

As Kingston Hydro’s data tracking capabilities improve over time to capture more granular information on capital project construction (an outcome expected by way of the ongoing implementation of the new Financial System), the utility can perform similar analysis on reliability performance trends across particular types of equipment and/or particular parts of this system where significant capital renewal expenditures take place. In doing so, the utility can seek to validate the value proposition of its capital work beyond the instances of poor weather and/or prioritize among the contemplated investment projects.

6. Proposed Metrics Framework

6.1. Overview and Structure of Proposed Metrics Framework

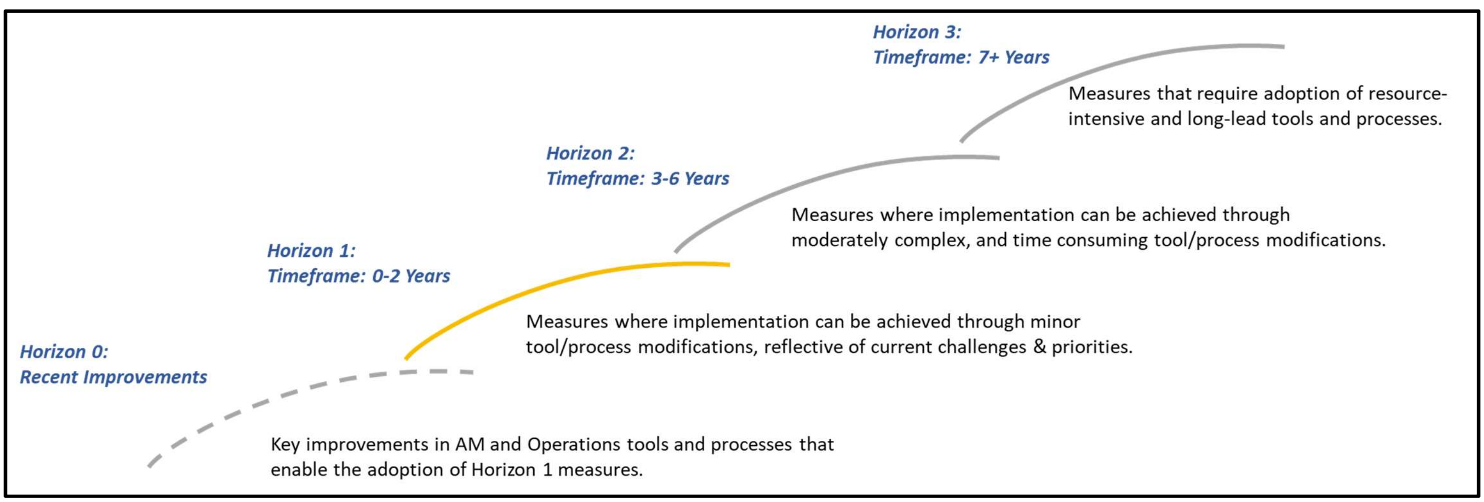
This section contains the list of performance measures METSCO presents for Kingston Hydro's consideration following our review of the utility's operations and documentation supporting them. We structure our metrics recommendations along the three groups of metrics articulated in the OEB's Chapter 5 *Filing Requirements for Distribution System Plans*, reflecting our understanding of each category as discussed in Section 3 of this report.

METSCO notes that the list of metrics that we recommend in each category is substantially larger than what we advise Kingston Hydro to adopt for the purposes of fulfilling its Final Settlement commitments. In several cases, the recommended measures rely on implementation and consolidation of tools and processes that are not currently in place, and which Kingston Hydro is only potentially exploring. However, we present these metrics in an effort to outline a potential evolution path of Asset Management and Operating capabilities that Kingston Hydro may explore in its strategic planning beyond the current needs and commitments.

As such, METSCO relies on Kingston Hydro's management to ultimately select and prioritize the measures in terms of their relevance, urgency and/or feasibility. Our only recommendations with respect to selection is to make sure that the ultimate framework reflects all three OEB categories, addresses the explicit Final Settlement commitments, and includes no more than six to 10 measures for immediate implementation.

To facilitate the prioritization process, we propose that Kingston Hydro consider the following dynamic framework, comprised of four implementation Horizons, based on consideration of requisite implementation capabilities and expectations of timelines over which these capabilities can be developed.

Figure 6-1: Proposed Four Horizons Framework for Measure Prioritization



As illustrated in Figure 6-1, each Horizon is associated with an anticipated implementation timeframe, ranging from zero to two years, to seven years and beyond. Each horizon is grounded in the acquisition of capabilities underlying the previous one, along with implementation of additional tools and processes within the phase itself that may be planned or contemplated and which are required to enable the activities or outcomes being measured. Horizon 1 represents the measures that are being explicitly targeted for implementation in the immediate future, and/or already in use for performance measurement today.

Each subsequent horizon represents the metrics that are being broadly contemplated or aimed for but are by no means firmly committed to by the utility. This is especially the case for Horizon 3, which represents a long-term strategic consideration frontier for contemplating the longer term means of dealing with impact of emerging technologies, business needs, or external constraints. Accordingly, while Horizons 2 and 3 represent the “goalposts” that a utility aims for with some degree of determination and certainty, the instances of outer horizon measures being amended or discarded should be expected in accordance with the evolving circumstances.

A crucial feature of the framework is the Horizon 0 – which represents a realistic assessment of existing and recently acquired capabilities, required for informed consideration of feasibility and desirability of measures considered for the following phase. As such, Horizon 0 is dynamic – in that every subsequent horizon is viewed as Horizon 0 when contemplating the following phase.

Beyond this prioritization framework, METSCO expects that Kinston Hydro will apply a number of its own criteria to select the measures that it wishes to implement, including relevance, costing considerations, and alignment with strategic and operational priorities beyond the scope of METSCO’s engagement, among others.

6.2. Proposed Performance Measures

Figure 6-2 summarizes the performance measures that METSCO recommends for Kingston Hydro's consideration following our engagement with the utility.

Figure 6-2: Proposed Performance Measures

Customer-Oriented Performance	Planning and Execution Efficiency & Effectiveness	Equipment-Specific Performance
1. Average Customer Hours Interrupted (CHI) during "Severe Weather" Hours 2. Customer-Average Interruption Duration (CAIDI): "Top 10" Hours 3. Planned Road Cuts Sharing / Coordination Ratio (%) 4. Automated Outage Identification Implementation Progress (OMS-dependent) 5. Customers Experiencing Multiple Interruptions (CEMI) 6. Customers Experiencing Long Duration Interruptions (CELID)	1. Emergency Maintenance as a Portion of Total Maintenance (%) 2. Warehouse Materials on Time and in Full (OTIF %) 3. Design/Completion Project Spend Average Variance (%) 4. Wood Pole Asset Value Chain Breakdown ($ and %) 5. Warehouse Average Days in Inventory 6. Group Procurement Materials Cost Savings (%) 7. Percentage of Asset Base with Health Index Scores 8. Progress of OMS/GIS/CIS Systems Integration	1. Gas-Insulated Switch Planned Outage Customer Hours of Interruption (CHI) Avoided 2. Percentage of Station Transformers at 90%+ Subscribed Capacity 3. Average CHI for Defective Equipment Outages 4. Defective Equipment System Average Interruption Frequency Index SAIFI) by Asset Class: a. Poles b. Underground Cables c. Transformers 5. Replacement Value of Poles in Poor and Very Poor Condition 6. Most Vulnerable Feeder SAIDI/SAIFI/CAIDI

6.2.1. (A) Customer-Oriented Performance Measures

A1. Average Customer Hours of Interruption (CHI) During Severe Weather Days.

Definition: Three-year running average of combined CHI for Tree Contacts, Defective Equipment and Adverse Weather cause code outages, occurring on days that meet the threshold definition of Severe Weather, less any CHI recorded on Major Event Days (MED) as per the IEEE 1366 methodology. We recommend that Kingston Hydro select one or more of the following definitions of Severe Weather Days:

- Days with Maximum Wind Gust of 50 km/h or higher;
- Days with Maximum Wind Gust of 50 km/h or higher AND any amount of Precipitation (0mm+);

- Days with Precipitation of 2.5 mm of more;
- Days with Wind Gust of 70 km/h or higher.

Discussion:

The proposed metric is responsive to Kingston Hydro's commitments in the Final Settlement to track system performance on the days with severe weather. Each of the thresholds we recommend has a reasonably high R-squared value (indicating causation) and is reasonably simple to track and calculate in the context of Kingston's current reliability tracking processes and capabilities. It would, however, require periodic downloading and merging of reliability data with publicly available Environment Canada's weather station information.

METSCO also advises to track the measure on a three-year rolling basis, to account for natural fluctuations in weather year over year. A measurement approach for reliability using a rolling average is consistent with the OEB's approach for reporting of SAIDI and SAIFI, where a longer five-year period is used. Our recommendation of using CHI as opposed to CI or outage numbers reflects our opinion that CHI is the measure best aligned with the OEB's outcomes-based approach, as it at once incorporates the incidence of an outage and the time it took the utility to resolve it. As such, it is a measure that encompasses both the performance of the utility's capital equipment and its outage restoration operating functions. Finally, we suggest the removal of IEEE- and OEB-compliant MEDs since utility systems cannot be reasonably expected to sustain the impact of events which are statistical outliers in terms of their impact. Given that the impact threshold for outlier events becomes more stringent with each subsequent

A2. Customer Average Interruption Duration (CAIDI) "Top 10".

Definition: A three-year rolling average of the output of a ratio of System Average Interruption Duration Index (SAIDI) over System Average Interruption Frequency Index (SAIFI), less the impact of Loss of Supply and MED events for the top 10 days contributing to CAIDI in each year:

$$3Yr\ Average\ \left(\frac{SAIDI\text{-}\ (\text{Loss of Supply} + Planned + \text{MED})}{SAIFI\text{-}\ (\text{Loss of Supply} + Planned + \text{MED})}\right)(Top\ 10\ Days)$$

Discussion:

METSCO acknowledges that CAIDI as a metric is no longer required for regulatory reporting by the OEB. However, in the context of Kingston Hydro's efforts to measure its performance during poor weather days, and the stated benefits of the system's looped design, METSCO believes that measuring the trend in CAIDI for the 10 days with highest contributions in a year, represents a viable and easily derivable operations-focused metric.

The focus on the 10 worst CAIDI days in a year represents a dynamic non-weather threshold-based way to explore the operational effectiveness of the utility's field restoration crews and control room operators during the most operationally challenging days, which often coincide with poor weather. The proposed removal of MED, Loss of Supply and Planned Outage-driven stats accounts for instances where efficient outage restoration may be beyond Kingston Hydro's control, and where outages involve reactive response. As with the weather-related CHI metric, we propose to use a three-year rolling average to smooth out annual variability.

A3. Planned Road Cuts Sharing/Coordination Ratio (%)

Definition: A ratio of total planned projects in a single year involving asphalt cuts / excavation on public roads where only Kingston Hydro work took place, over the total number of planned projects involving road cuts /excavation involving Kingston Hydro's work, and by extension work of other private- or public-sector entities:

$$\frac{\textit{Planned Projects with Road Cuts Involving KH work only}}{\textit{All Planned Projects with Road Cuts}}$$

Discussion:

The impact of utilities conducting their daily operations on the lives of residents in its service territory (and particularly in a municipal context) is a dimension of operations that has not received a broad degree of formal consideration in the context of utility regulation. Nevertheless, pedestrian and vehicular traffic flow interruptions cause material inconvenience for residents, business and other municipal services relying on unconstrained access or affected by traffic congestions (e.g. transit systems, garbage collection etc.).

Coordination with other parties that own or operate underground assets also facilitates cost sharing arrangements, which helps utilities manage their costs of intervention. In our discussions with Kingston Hydro, the utility's management highlighted their focus on attempting to coordinate planned underground work with other municipal service delivery entities. To quantify the effectiveness of this approach, we propose this simple metric that tracks the ratio of planned underground work on public roadways where only Kingston Hydro's work was executed, relative to the total roadway excavation projects that Kingston Hydro participated in over the course of a year. Our assumption is that the total number of excavation projects includes the instances of coordination with other public services (sewage, gas, water) or private sector companies (e.g. cable providers) and/or particular customers that may be interested in conducting some work that is not related to Kingston Hydro's work.

In proposing this metric, we rely on Kingston Hydro's discretion as to how to define an individual "project" and whether a materiality threshold (in terms of dollars spent or effort involved) is appropriate to remove the instances of smaller-scale low-impact work. Should this ratio be adopted, success over time would be indicated by keeping the ratio as low as possible.

A4. Automated Outage Capability Detection Implementation Progress

Definition: Percentage completion of the contemplated project to enable automatic identification of outages using smart meter last gasp technology. The percentage can be expressed as a ratio of predetermined milestones over total milestones, completion count of phases, or progress of enablement as a percentage of total number of meters, among other possible expressions.

Discussion:

We understand that Kingston Hydro is yet to formally decide on this project, though it has considered it broadly. Moreover, its implementation is dependent on the completion and consolidation of the OMS project, along with potential further enhancements to the control centre and AMI infrastructure. As such, we advance this measure for consideration in the longer term – as a potential outer-horizon objective and measure.

Utilization of last-gasp technology (which is available on Kingston Hydro smart meters) to automatically detect instances of outages can help the utility detect the instances and triangulate the extent of impact of outages faster and more efficiently. While this proposed metric is not meant to capture the achievement of customer outcomes, it represents a no less valid measure of Input or Capability development, consistent with the classification of weather-event related metrics discussed in the Industry Scan section. While outcome-based measurement should always be an end goal, it is, in METSCO's opinion, no less valid to measure the progress of actions taken to enable the realization of newer and/or enhanced outcomes.

A5. Customers Experiencing Multiple Interruptions (CEMI)

Definition: Number of customers in the last year (rolling basis) who have experienced a total number of sustained interruptions meeting or exceeding a pre-determined threshold number (e.g. CEMI-10 measuring the number of customers who experience 10 or more outages).

Discussion:

This measure is focused on determining particular customers and/or areas of the system experiencing a larger number of outages than the system average, to target and prioritize short-term intervention measures like additional tree trimming, insulator washing, animal guard installations, or other types of reactive measures. The threshold is typically determined by way of analysis of past interruption data to isolate a portion of customers (e.g. 90th percentile and up) that experience the highest number of interruptions. As the number of customers beyond a given threshold decreases over time as a result of proactive and reactive intervention work, the threshold can be reduced to ensure that performance improves on an ongoing basis, up to the point when the number of interruptions experienced across the customer base becomes more uniform.

As with a number of other advanced reliability measures we recommend for Kingston Hydro's consideration, this metric requires advanced outage management and detection capabilities, and as such, may be suitable as an outer-horizon consideration. METSCO also notes that CEMI was among the advanced customer-specific reliability measures that the OEB was exploring through an expert working group in 2014-2015. However, we are not aware as to the outcomes of this group's work and/or any specific recommendations ensuing from its activities.

A6. Customers Experiencing Longest Interruption Durations (CELID)

Definition: Number of customers in the last year (rolling basis) who have experienced interruptions longer than a particular pre-determined threshold duration value, in minutes or hours.

Discussion: Similar to CEMI, this advanced customer-specific reliability measure is used to identify particular customers and/or areas that are experiencing abnormally long durations of interruptions, to conduct near-term investigations and remedy issues as necessary. The establishment of a given threshold value and its gradual adjustment as performance improves follows an approach equivalent to CEMI. Like CEMI, tracking this measure also relies on advanced outage detection and tacking capabilities, and was under consideration by an OEB working group in the recent past.

6.2.2. (B) Planning and Execution Efficiency and Effectiveness Measures

B1. Emergency Maintenance as a Portion of Total Maintenance Work.

Definition: Percentage of total annual maintenance expenditures represented by emergency maintenance activities:

$$\frac{\$\,Emergency\ Maintenance\ Work}{\$\,Total\ Maintenance\ Work}$$

Discussion:

At present, Kingston Hydro does not separate its tracking of maintenance expenditures by whether they were planned, reactive (i.e. identified and rectified following regular inspections) or emergency (driven by unanticipated equipment failures or outages). In light of the utility's focus on capital renewal, tracking whether and to what extent the utility's emergency maintenance expenditures are being affected by the capital spend would provide the utility with an enhanced understanding of the capital-maintenance causal relationship in relation to capital renewal work. Understanding the interplay of these factors is also among the OEB priorities, as articulated in Chapter 5 Distribution System Plan filing requirements. Finally, this measure is in place in at least two utilities identified in our industry scan.

We note that implementing this metric would require for Kingston Hydro to set up several new billing codes to be used by field crews reporting on work completed, and subsequently entered into the new information system. At this point we do not recommend separating out any particular outage causes or equipment types to establish a broad baseline relationship over a number of years. However, in the future, Kingston Hydro may consider tracking this information for specific types of equipment – for instance those that it targets at a particular stage of its replacement efforts.

B2. Warehouse Materials on Time and in Full Availability (OTIF %)

Definition: The rate of same-day availability of materials and equipment requested by crews in the warehouse over the course of the year:

$$\frac{\$\,Total\ Materials\ \&\ Equipment\ Available\ Upon\ Request}{\$\,Total\ Materials\ \&\ Equipment\ Requested}$$

Discussion:

Our interviews with Kingston Hydro revealed anecdotal instances where materials for non-emergency work are occasionally requested from the warehouse without sufficient lead time, resulting in some items not being available, requiring some adjustments to scheduled work and issuance of rush equipment orders to the utility's suppliers. In suggesting this metric, we echo our earlier recommendation for the Engineering and Operations teams to integrate their Supply Chain counterparts into the project planning activities to maintain clear lines of communication throughout the capital value chain.

We understand that implementing this measure would entail establishing a new tracking process in a warehouse that currently relies on manual practices. To potentially simplify this task, we suggest using the total Rush Order records in a year as a reasonable proxy for items that were not available, but removing the rush premium prior to conducting the calculation, as the metric is about availability (i.e. effectiveness) rather than cost management. Nevertheless, the amount of rushed order premium costs that would be derived as a result of such calculation would itself entail an important piece of information for management.

Finally, we note that this metric could incent Kingston Hydro's staff to inefficient behaviors – such as overordering the equipment, which would increase the overall inventory costs. For this reason, we recommend that this metric be considered for implementation in conjunction with a Days in Inventory metric discussed below.

B3. Design/Completion Project Spend Average Variance (%)

Definition: Dollar-weighted average variance of all capital project costs estimated at the design stage, vs. the project actual final completion cost, tracked annually:

$$Weighted\ Average\ \left(\frac{\$\ Design\ Stage\ Estimate\ Cost}{\$\ Actual\ Completion\ Costs}\right)$$

Individual project variances are to be calculated prior to being averaged on a dollar-weighted basis, with larger (more expensive projects) having a proportionally larger effect on the calculated weighted average variance than smaller projects.

Discussion:

In our interviews with Kingston Hydro, we were impressed with the close coordination between the planning and work execution functions throughout the project planning and implementation cycle. We propose that the utility implement a formal measure that tracks the difference in costs between the project cost estimates at the time of producing project designs, relative to these projects' final costs. This metric would act as an indicator of any significant variances between the input assumptions and actual field conditions, while also incenting the utility's construction crews to explore opportunities for work execution efficiency gains in order to better adhere to the planned costs.

We note that this metric can be particularly effective if both field crews and asset planners review the results periodically and explore opportunities for adjusting the input assumptions or the operating procedures. As with any utility construction project, we urge Kingston Hydro to keep employee and public safety as the top priority – above any potential efficiency gains.

B4. Wood Pole Asset Value Chain Breakdown ($ and %)

Definition: Year over-year changes in relative cost contributions ($ and %) to the cost of a fully dressed wood pole (poles + fixtures), broken down by (a) Materials, (b) Installation Labour, (c) Engineering Labour, (d) Trucking, (e) Warehouse Overhead, (f) Other (e.g. equipment rentals, corporate overhead, etc.). The results are to be reported as an average of all units analyzed in a given year. Certain exclusions, such as non-typical equipment, customized installations to meet client-specific demands etc., can be considered for exclusion from the calculation.

Discussion:

Consistent with our exploration of advanced operations management approaches to tracking work execution efficiency, we proposed that Kingston Hydro implement a measure tracking relative contributions of the key stages in a full value chain of a typical wood pole installed by the utility. Tracking the average changes across each component year-over-year can enable the utility to identify trends and opportunities for more detailed investigation and action. By breaking down the total installed cost of a pole (or any other asset) into its core value chain components, the utility is effectively tracking unit costs, but in a manner than provides managerially meaningful insights across all major functions of the utility that contribute to the final cost of capital installations. We understand that implementing such a metric would entail adding incremental billing codes to the utility's financial system and making other process adjustments to ensure that the procedures are followed and regular reviews of results take place.

We note that the total number of poles that Kingston Hydro installs or replaces in a given year may not be sufficient to draw robust conclusions in the first few years of tracking, as the influence of outliers can materially affect the results. Accordingly, we propose that Kingston Hydro may wish to build up a baseline dataset of at least three years prior to using this measure for external reporting. This, however, does not imply that the interim reviews could not be used to inform management's ongoing decision-making.

B5. Warehouse Inventory Turnover (Days in Inventory).

Definition: The length of time (in days) that materials and equipment spend in the utility's inventory in a given year. A lower number of days implies that the utility is managing its inventory effectively and is not keeping unnecessarily high amounts of materials on hand (which would imply incurring additional working capital costs). The metric, as proposed here, is calculated in the following three steps:

Step 1: Determine Average Annual Inventory Amount – the average value of supplies and materials on hand throughout the year ($):

$$\frac{\$Opening\ Inventory + \$\ Closing\ Inventory}{2}$$

Step 2: Calculate the Inventory Turns – the number of times that the inventory is "turned over" (replenished) in a given year:

$$\frac{\$\ Materials\ Used\ in\ a\ Year}{\$\ Average\ Annual\ Inventory}$$

Step 3: Calculate Days in Inventory:

$$\frac{365}{Inventory\ Turns}$$

Discussion:

While this metric is primarily used by the private sector commercial organizations to determine the efficiency of the production process volumes relative to the speed and volume of sales, METSCO believes that this standard financial accounting framework, modified for use in a utility environment, could provide another dimension of tracking capital spending efficiency and effectiveness. Materials and equipment are a key input factor into construction of electricity assets and one of the steps in the Value Chain we described earlier. As such, tracking the efficiency of inventory management may enable the utility to identify and act on additional opportunities to manage the cost of its capital installations and reactive maintenance work.

Since this is a new metric for Kingston Hydro, we suggest establishing a baseline of at least three years ahead of commencing external reporting on this measure. As we noted in our discussion of the Warehouse on Time and in Full (OTIF) metric, tracking both Days in Inventory and OTIF metrics, balances the risk of the utility keeping too much or to little inventory on hand – the potential perverse incentives associated with either metric.

B6. Group Procurement Materials Cost Savings (%)

Definition: Equipment and materials savings enabled by way of group procurements through the GridSmart group, relative to the baseline cost of the same basket of goods procured in recent past by Kingston Hydro on its own:

$$1 - \left(\frac{\$ \text{ "Basket of Goods" } Procured\ through\ GridSmart}{\$\ Historical\ Baseline\ Basket\ of\ Goods}\right)$$

Discussion:

METSCO endorses Kingston Hydro’s efforts to capitalize on additional procurement efficiencies by exploring group procurements along with other utilities in the GridSmart group. To track the benefits of this initiative once it is fully underway, METSCO proposes that Kinston Hydro calculate the percentage savings on the basis of a “standard basket of goods” (e.g. 10 units of 40-ft poles + 10 pole tope transformers + 100 m of overhead conductor). The Historical reference basket should use the most recent actual procurement costs as defined in existing supplier contracts. The difference in costs (adjusted for inflation) would represent the vale of savings that the utility generated by way of GridSmart procurements.

METSCO recognizes that this measure is only suitable on a limited -time basis, such as measuring the savings in the first year of GridSmart implementation vs. the last year of the previous procurement approach (as the baseline becomes less relevant the longer the new approach has been used). However, it is potentially feasible to track aggregate savings over the first several years of implementation (such as a five-year CIR period). In this case, however, it would also be appropriate to adjust the baseline number for inflation for each of the years over which the aggregate savings are tracked.

B7. Portion of Asset Base with Health Index Scores (%)

Definition: The percentage of utility’s assets, either within a single asset class or across the system for which comprehensive inspection- and testing-based Health Index scores are available, adjusted for assets where collection of condition / diagnostic performance testing is complex and/or impractical.

$$\left(\frac{\#\ of\ Units\ with\ Recorded\ Inspection\ HI\ Scores}{Total\ \#\ of\ Units\ Across\ Key\ Asset\ Classes}\right) - \#\ of\ "Infeasible"\ \&\ "Impractical"\ Assets$$

Discussion:

In our industry scan, we noted the extent of measures related to asset health tracked and reported by the New Zealand utilities, enabling the local regulator to keep aggregate indices across the asset classes. Noting Kingston Hydro's progress in collecting Health Index parameters for its population of wood poles using the methodology developed by Kinectrics, we recommend that the utility adopt a broader measure, covering all of its assets classes to track its progress in obtaining empirical asset condition data to better inform its asset management decisions.

We note that in tracking this measure, Kinston Hydro should adjust the total base number of asset units (i.e. the denominator) for assets where access issues prevent cost-effective collection of information (e.g. most underground assets or assets requiring destructive testing), along with inexpensive assets where condition monitoring is not economical (e.g. animal guards). The utility should update both numerator and denominator each time the ratio is calculated to account for retirements and new installations. Changes in the percentage of assets would indicate progress on enhancing the utility's understanding of its own asset base.

B8. Progress of OMS / GIS / CIS Integration Activities.

Definition: Percentage completion of the contemplated project to enable the integration between the utility's Outage Management, GIS Asset Registry and Customer Information System (CIS) capabilities. The percentage can be expressed as a ratio of predetermined milestones over total milestones, or completion count of phases.

Discussion:

We understand that Kingston Hydro is yet to formally decide on the timing of this project, however it targets it broadly. As such, we advance this measure for consideration in the longer term – as a potential outer-horizon objective and measure. The full integration of customer-specific data with outage management and asset management systems would enable the utility to derive more comprehensive insights as to the impact of planned and ongoing activities, leading to opportunities for planning, operating, and work execution efficiencies, along with calculation of customer-specific reliability performance measures, among others.

6.2.3. (C) Equipment-Specific Performance Measures.

C1. Gas Insulated Switches Planned Outage CHI Avoided

Definition: Total number of hours of avoided planned outages enabled by installation of Gas-Insulated Switches that do not require equipment outages to conduct live-switching and maintenance work:

# of Hours for live-switching and maintenance in a Year on Assets with new gas-insulated switches × Average Customers Connected to these Assets

Discussion:

METSCO is aware that Kingston Hydro has already committed to develop a measure of positive impact of its recent installation of gas-insulated switches in many areas of its system. As such, we endorse the measure and propose that the impact be expressed in the form of Total Customer-Hour Interruptions avoided, to capture the positive impact on Kingston Hydro's customers who would otherwise be affected by planned outages. We also note, however, that the installation of switches that enable "live" work on surrounding equipment carries additional financial and coordination benefits in terms of reduced workload for the control centre staff, customer outreach, public notification requirements, etc.

C2. Percentage of Station Transformers at 90%+ of Available Capacity.

Definition: The portion of Kingston Hydro's transformers at or beyond the 90% subscription of firm capacity thresholds:

$$\frac{Station\ Transformers\ at\ 90\%+\ Firm\ Capacity}{All\ Station\ Transformers}$$

Discussion:

We propose this measure as a leading indicator for identifying potential need for capacity enhancements and/or long-term load transfer projects as a result of changes in customer connection capacity requirements. We also see this measure as a means of assessing Kingston Hydro's power system planning effectiveness, to ensure that system reconfiguration and/or expansion takes place sufficiently early to avoid the instances where subscription levels could pose risks to continued equipment operation.

Our interviews with Kingston Hydro revealed the instances where anticipated load increase requirements from new and existing customers may push one or more station transformers to the levels approaching the limits of their normal operating capacity. As such, an aggregate system-wide measure would enable the utility and regulator to track these developments on an ongoing basis. We also note that a similar measure is in place at Toronto Hydro, as indicated in our industry scan.

C3 Average CHI for Defective Equipment Outages.

Definition: Annual average CHI for all Defective Equipment Outages Experienced, less any MED-attributed outages.

Discussion: We propose this measure to track the extent of impact on Kingston Hydro's customers by outages caused by defective equipment, as an indication of the state of repair of the utility's capital plant. The assumption underlying the proposal is that targeted equipment mitigates the aggregate duration of customer interruptions that would occur otherwise. Over time, this metric's results could be used to inform the utility's planning decisions as to which assets to replace. As with other reliability-centered measures we recommend that the utility use CHI as a measure of customer outcomes related to equipment outages.

C4 System Average Interruption Frequency Index – Defective Equipment by Major Asset Class: Poles, Underground Cables, Transformers.

Definition: Contribution to SAIFI of defective equipment outages attributed to specific asset classes, deemed to be in a particularly poor condition, or otherwise prioritized by the utility or considered for future prioritization.

Discussion:

This measure (or rather a set of measures for multiple asset classes) is similar to the aggregate Defective Equipment CHI measure proposed above. However, unlike the previous measure that is meant to track the aggregate impact of defective equipment on Kingston Hydro customers overall (a lagging "outcome" indicator of the system's overall state of repair), we see this measure as a type of a leading indicator for the purposes of long-term planning.

Measuring system-average interruption frequency of defective equipment-caused outages across multiple asset classes provides the utility with indication of the relative impact magnitude of each equipment type's failure on the system as a whole. As such, observation of changes in multi-year trends across different asset classes may present the utility with another way to plan and prioritize its future replacement work across a number of potential capital allocation options.

Should Kingston Hydro elect to pursue this measure, we leave it up to the utility's discretion what asset failure contributions should be tracked in this manner. We note, however, that tracking of this metric may require certain enhancements to the utility's outage tracking tool and processes.

C5 Replacement Value of Poles in Poor and Very Poor Condition ($)

Definition: The aggregate value (in dollars) of the portion of Kingston Hydro's population of wood poles in Poor and Very Poor Condition:

(# of Poles in Poor Condition + # of Poles in Very Poor Condition) x Average Cost of New Pole (Materials + Installation Labour)

Discussion:

Aggregate replacement value of poles (or other equipment types) at or near critical condition installed in the field is a means of quantifying the potential financial implications of a backlog of assets requiring replacement in the near future. A utility's goal would be to reduce the total value (by way of clearing the backlog) over time, and/or manage it at a certain level deemed to be acceptable. The utility would be expected to investigate and take appropriate measures in cases where the backlog value begins to increase over time.

In deriving the average replacement value, the utility can use the material costs only, which would significantly simplify the tracking and reduce the number of assumptions underlying it. Directional changes in the value of replacement value based on materials costs alone would be suitable for the purposes of signaling changes in trends. However, supplementing them with the estimated standard removal and installation labour costs (as measured by way of the Value Chain metric we propose above) would present a more complete picture in terms of potential financial consequences of slowing down the pace of replacements. As such, should Kingston Hydro elect to accept this measure, we propose that it begin measuring the equipment costs only, and eventually supplement them with labour costs as well, once sufficient data is in lace to derive reliable average labour unit cost estimates.

C6. Most Vulnerable Feeder SAIDI, SAIFI and CAIDI.

Definition: SAIDI, SAIFI and CAIDI calculated for a particular subset of feeders, selected on the basis of factors such as (a) complexity of restoration efforts (due to switching, number of circuits on poles etc.), (b) access (e.g. rear-lot feeders), (c) number of and/or criticality of customers; (d) condition of assets, or (e) combination of the above.

Discussion:

Kingston Hydro does not currently track a Worst Performing Feeder Metric, such as the one in place at Toronto Hydro and a number of other utilities. While this measure (based on a certain performance threshold like a number of outages) would be useful, we believe that a slight modification may be more appropriate given the dynamic nature of Kingston Hydro's looped distribution system.

Instead of measuring the number of Worst Performing feeders with the aim of reducing this number over time, we propose that Kinston Hydro select a subset of most *vulnerable* feeders and track their reliability performance over time. The selection of most vulnerable feeders could be expressed in a number of different ways, such as the feeders where an outage would be most costly or complex to rectify should it occur. Our recommendation of this particular metric stems from our finding that a material portion of Kingston Hydro's feeders is made up of rear-lot feeders, which are notorious for access issues due to surrounding vegetation and recreational equipment on customer properties, lack of paved surfaces, and lack of illumination in the evening hours (among others). However, we note that factors other than access may form equally valid basis for selecting a subset of feeders.

The insights from this measure can help the utility monitor the performance of its "most problematic" areas and explore specific intervention options as needed.

7. Potential Peer Utility Group for Comparisons

As the final dimension of our engagement with Kingston Hydro, the utility asked METSCO to explore a potential peer group of Ontario utilities that would represent potentially suitable comparators for the purposes of performance measurement. We understand that Kingston Hydro has no formal basis on which to request that potential peer utilities consider adopting consistent metrics that would enable cross-utility comparisons. Moreover, and as we state throughout this report, METSCO's primary objective was to select the metrics that are relevant for Kingston Hydro's specific issues, which may limit their applicability to other specific utilities that may otherwise appear as suitable comparators on the basis of the comparability assessment we performed. Notwithstanding these potential limitations, we attempted to develop a simple methodology based on publicly available data. METSCO relied primarily on information contained in utility rate applications and the OEB Yearbook of Utility Distributors.

We strongly advise that Kingston Hydro consider additional factors to determine the appropriateness of these comparisons, including targeted discussions with the identified utilities, and others that it may see as better comparators.

7.1. Methodology

Our selection methodology was comprised of two phases as described below:

Phase I – Establish Numerical Comparability:

Identify a shortlist of utilities with numerical indicators (OEB account balances or ratios) comparable to those of KH on the following parameters:

- Property, Plant and Equipment (PP&E) value,
- Current Depreciation Spend as a percentage of PP&E
- Percentage of Overhead Lines
- Maintenance Spend as percentage of Gross PP&E
- OM&A Spend as percentage of Gross PP&E

Phase II – Assess Broad Operational Comparability:

Using professional judgment and available information about key system characteristics, narrow down the list of potential utilities. We used the following additional criteria to assess Phase II comparability:

- Number of Customers;

- Aggregate Service Area Population Growth in the Past 10 years;[33]
- System Renewal Spend as percentage of Total DSP spend advanced in the most recent OEB application;
- Whether the utility was a part of Kingston Hydro's former Peer Group for the purposes of Pacific Economics Group's (PEG) group benchmarking analysis performed in the past;
- Key system renewal needs by asset category, as determined by way of review of most recent rate applications;
- Total Expenditures per Customer, Kilometer of the Line and PEG Efficiency Cohort.

7.2. Findings:

As the Figure 7-1 illustrates the 10 utilities with financial metrics and ratios closest to Kingston Hydro's (where applicable) on the basis of the 2016 OEB Yearbook of Electricity Distributors. METSCO looked for five utilities with the closest values above and below Kingston, to identify ten utilities that were comparable to Kingston Hydro.

In doing so, METSCO sought to find the utilities whose scale of operations could be broadly comparable to Kingston's on the basis of ratio analysis of publicly available financial information. Our goal in performing this assessment was to select utilities which would have as many "Similarity Hits" within the selected framework of ratios as possible, as a broad proxy for some similarity of capital asset base, operating and maintenance expenditures, and the interplay between the two.

Figure 7-1: Ontario Utilities with Financial Stats and Ratios Nearest to Kingston Hydro's

					← Larger	Nearest 10 Utilities	Smaller →				
Property, Plant & Equipment (PP&E)	Festival Hydro	Welland Hydro	Westario Power	Innpower Corp	Lakeland Power	**Kingston Hydro**	Niagara-on-the-Lake	Eerie Thames	Grimsby Power	St Thomas Energy	Orillia Power
Depreciation as % of PP&E	Grimsby Power	Guelph Hydro	Hydro One	PowerStream	Orangeville Hydro	**Kingston Hydro**	Atikokan Hydro	Canadian Niagara Power	Westario Power	West Coast Huron	Hydro Hawkesbury
Overhead Lines Percentage	Welland Hydro	Eerie Thames	Energy+	Peterborough Distribution	Grimsby Power	**Kingston Hydro**	Waterloo North Hydro	Midland Power	Festival Hydro	COLLUS PowerStream	EnWin Utilities
Maintenance as % of PP&E	-	-	-	Horizon Utilities	Cooperative Hydro Embrun	**Kingston Hydro**	Sioux Lookout Hydro	Oakville Hydro	Waterloo North Hydro	Peterborough Distribution	Essex Powerlines
OM&A as % of PP&E	Horizon Utilities	Hydro Hawkesbury	Sioux Lookout Hydro	Oakville Hydro	COLLUS PowerStream	**Kingston Hydro**	Rideau St Lawrence	Waterloo North Hydro	Peterborough Distribution	Cooperative Hydro Embrun	Westario Power

[33] METSCO used Statistics Canada's population databases and our understanding of the boundaries of utility service areas.

Having selected the utilities with the highest number of "Similarity Hits," METSCO proceeded to consider additional publicly available information related to each of these utilities, comparing it to Kingston's. This analysis included consultation with publicly available sources, including census data, rate application materials and OEB 2016 Yearbook. While in most cases we relied on direct numerical data, our assessment of key Asset Renewal needs was based on qualitative evaluation of available rate application materials.

Figure 7-2: Additional Evaluation Parameters for Utilities Examined

Utility / Category	Similarity Matches	Customers	Population Growth Last 10 Years	Former KH OEB Peer Group?	PEG 2016 Productivity Cohort	System Renewal as % of DSP	Cost Per Customer	Cost Per Km of Line	Key Renewal Needs (per Rate Filing Info)
Kingston Hydro	-	27,541	2.38%	-	3	68%	$531	$43,562	Poles, Overhead Assets, Underground Lines
Westario Power	3	23,168	2.59%	Yes	3	n/a	**$578**	**$25,258**	Poles, Overhead Conductors
Grimsby Power	3	11,169	7.85%	No	2	44%	**$611**	**$27,753**	Poles, Overhead Lines, Underground Lines
Waterloo North Hydro	3	56,230	5.54%	No	4	48%	**$809**	**$28,094**	Poles, Overhead Conductors
Peterborough Hydro	3	36,574	2.31%	Yes	4	n/a*	**$604**	**$39,184**	Poles, Overhead Equipment
Festival Hydro	2	20,825	9.70%	No	4	57%	**$645**	**$51,669**	Poles, Pad-Mounted Transformers
Welland Hydro	2	22,853	8.02%	Yes	2	73%	**$510**	**$24,268**	Substations, Poles
Oakville Hydro	2	68,810	6.20%	No	3	47%	**$720**	**$26,324**	Poles, Station Equipmet
Average (Excluding Kingston)	-	**34,233**	**6.03%**	-	-	**54%**	**$640**	**$31,793**	

*n/a in the System Renewal as % of DSP column indicates that METSCO was unable to locate a utility filing where proposed investment categories were grouped on the basis of standard DSP four-category nomenclature

Of the subset of utilities with the highest number of matches within the "+/- five" group, Kingston is right in the middle in terms of customer size, has the second highest percentage of DSP spend allocated to System Renewal, and the lowest 10-year population growth of all the utilities. Three other utilities were a part of Kingston Hydro's former OEB benchmarking peer group, indicating another dimension of potential comparability.

Our cursory review of these utilities' replacement needs, as identified in their respective rate filings, identified that all utilities are facing material overhead system replacement needs, with varying degrees of station and underground system upgrades. However, the extent of publicly available information did not permit us to confirm the degree to which these distributors' system configurations are similar to Kingston Hydro's – a consideration that we suggest the utility explore further should it elect to engage any of these distributors.

Of the utilities shortlist reproduced on the previous figure, METSCO believes that Oakville Hydro and Grimsby Power are the most significant outliers among other utilities, given the combination of factors including their respective customer counts, comparatively low percentages of system renewal spend, high population growth in the last 10 years, high percentage of undergrounding in Oakville's case, and substantially different general service territory characteristics. Accordingly, we excluded these two utilities from further consideration.

As the final step of our comparability assessment, we reviewed Kingston Hydro's total costs per customer and km of the line based on the 2016 Yearbook of Distributors data. The results of this assessment illustrate the general concern with relying on unadjusted unit costs for utility comparisons that METSCO expresses elsewhere in this report. Across the remaining group of distributors, Kingston Hydro has second lowest expenditures per customer, which are 15% lower than the average expenditures for the remaining subgroup excluding Kingston.

At the same time, however, Kingston Hydro has second highest expenditures per line kilometer, which are 33% above the group average.

Aside from Welland Hydro, which has the lowest unit cost metrics across both categories, all other utilities in the sample change their ranks by an average of two spots between a Per Customer and Per KM ranking, which is significant considering the small size of the group. Considering the rankings across both categories, Kingston is tied for third, placing it right in the middle of the group.

Accordingly, and notwithstanding our concerns regarding the implications of comparisons on the basis of these unitized metrics, Kingston Hydro's costs appear to be generally comparable to the selected peer group. This conclusion is further supported by the most recent results of PEG's 2016 total cost benchmarking, which places Kingston and another utility in the sample into the third cohort, with one other utility being in the second, and the three remaining ones in the fourth cohort.

Based on the results of our methodology, we propose the following group of utilities depicted as the potential peer group that Kingston Hydro can explore further, should it determine the need to proceed with further engagements in this regard.

- Waterloo North Hydro
- Festival Hydro
- Peterborough Utilities
- Westario Power
- Welland Hydro

As we note above, our consideration was focused exclusively on higher-order, publicly available information, and does not reflect the level of rigour that we applied to Kingston Hydro's information in developing our proposed metrics. As such, METSCO's recommended list of utilities reflects their broad similarities to Kinston Hydro on a set of publicly available metrics, but does not necessarily indicate whether the specific metrics we propose are of relevance to these utilities given their respective strategic priorities and operating circumstances.

8. Concluding Observations

The framework of capital-related performance measures that METSCO proposes in this report is grounded in multiple modes of review and analysis, including in-person SME interviews, independent data analysis, review of the utility's systems, operating practices and databases, and an extensive review of best approaches to performance measurement deployed elsewhere in the industry, and the operations management community more broadly. While we believe that many of the measures comprising our recommendations would be appropriate for most mid-sized Ontario distributors, we note that this particular framework reflects our consideration of Kingston Hydro's specific circumstances, priorities, strengths, and improvement opportunities that we saw as both attainable and potentially impactful.

As noted earlier, METSCO expects that Kingston Hydro selects a subset of measures that we recommend for the purposes of tracking in the immediate term, using the prioritization framework recommended and/or other criteria that it may find relevant. Our only recommendations with respect to selection process is to ensure that the ultimate framework includes no more than six to 10 total measures, spanning all three of OEB-mandated categories, and responsive to the commitments made in the Final Settlement.

With respect to implementation of the measures chosen in the immediate term or beyond, we encourage Kingston Hydro to consider the following steps:

- Introduce the selected measures framework to planning, operations, and finance staff in a manner that clearly communicates the background of the initiative, along with the management's reasons for selecting a particular mix of measures;

- Emphasize the operating objectives underlying the subset of selected measures, rather than the obligations stemming from the OEB process;

- Develop a short but detailed implementation plan that would clearly articulate:

    - data input scope for each measure, including inputs to be excluded (if any);
    - timelines for process / IT system augmentations to enable tracking;
    - staff positions responsible for data collection and verification;
    - timelines within which the implementation process is to take place;
    - a framework for interim results reviews;
    - communication protocols (if any) for periodic performance updates to staff.

- Communicate to the OEB and other relevant parties the proposed terms of reporting, including the timing, frequency, and extent of supporting information to be filed alongside the results.

- Given the novelty of many of the measures we propose, establishing a clear process for identification, recording and discussion of any issues arising in the implementation process that may challenge the validity or practicality of certain selected measures.

- Avoid establishing targets in the first three years of implementation, to collect the appropriate baseline for further exploration in the future;

- Attempt to capture the costs of one-time and ongoing efforts to track the measures, to enable future assessment of the value proposition of additional tracking for the purposes of internal decision-making support and external sharing of experiences with fellow utilities and the OEB.

METSCO thanks Kingston Hydro and its staff for the opportunity to collaborate on this innovative project and looks forward to hearing about the outcomes of the implementation of its results. It is our hope that this report will serve to advance the understanding of the issue area of capital-related performance measurement both for Kingston Hydro, and the Ontario utilities industry more broadly.

9. Appendix

Figure A1 – Customer Hours Interrupted (CHI) during Poor Weather Threshold days divided by CHI in Non-Poor Weather Threshold Days. (*over time, the portion of outage minutes in "bad weather days" is reduced relative to those occurring on "regular days"*).

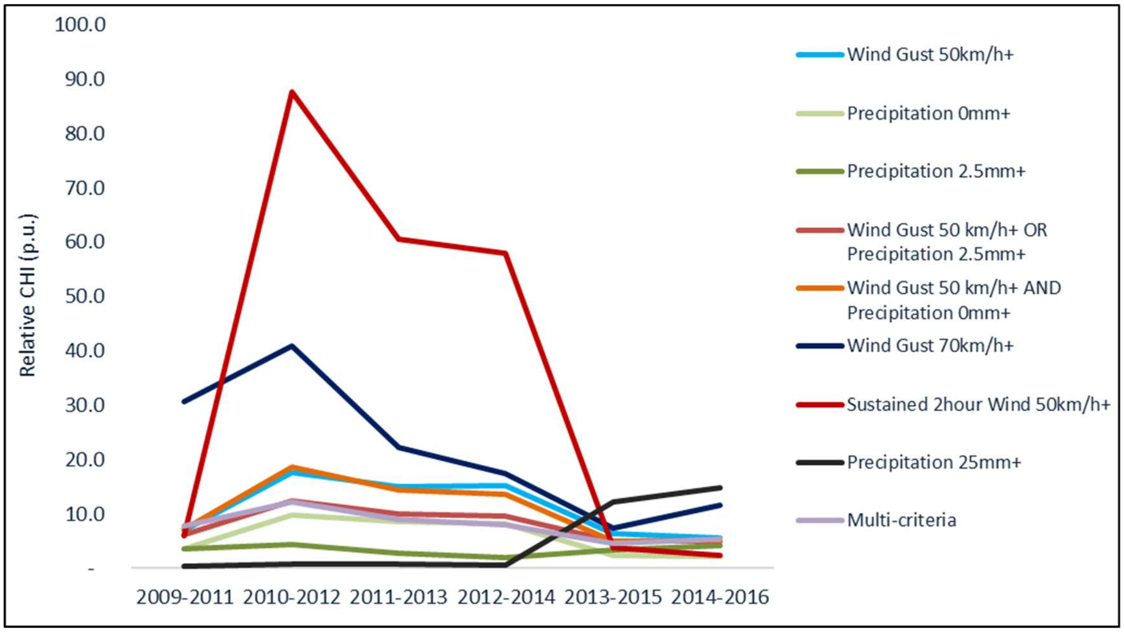


Figure A2 - Frequency of Poor Weather Threshold days across most definitions (3-year running average) increases over the years examined (*the total number of "bad weather days" stays constant or increases over the study period – while CHI on those days decreases as per Figure A1*).

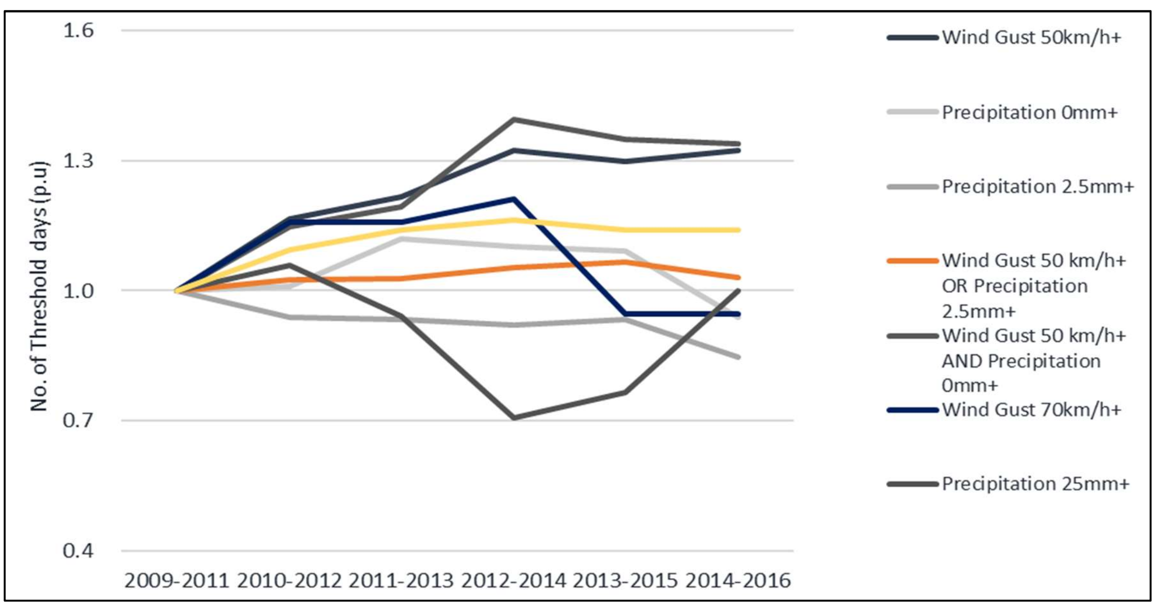


Figure A3 – Average CHI trend year-over-year basis during Poor Weather Threshold days
(*the average CHI in "bad weather days" goes down over time formost definitions, but the trend is more difficult to see year due to year-over-year volatility of weather*).

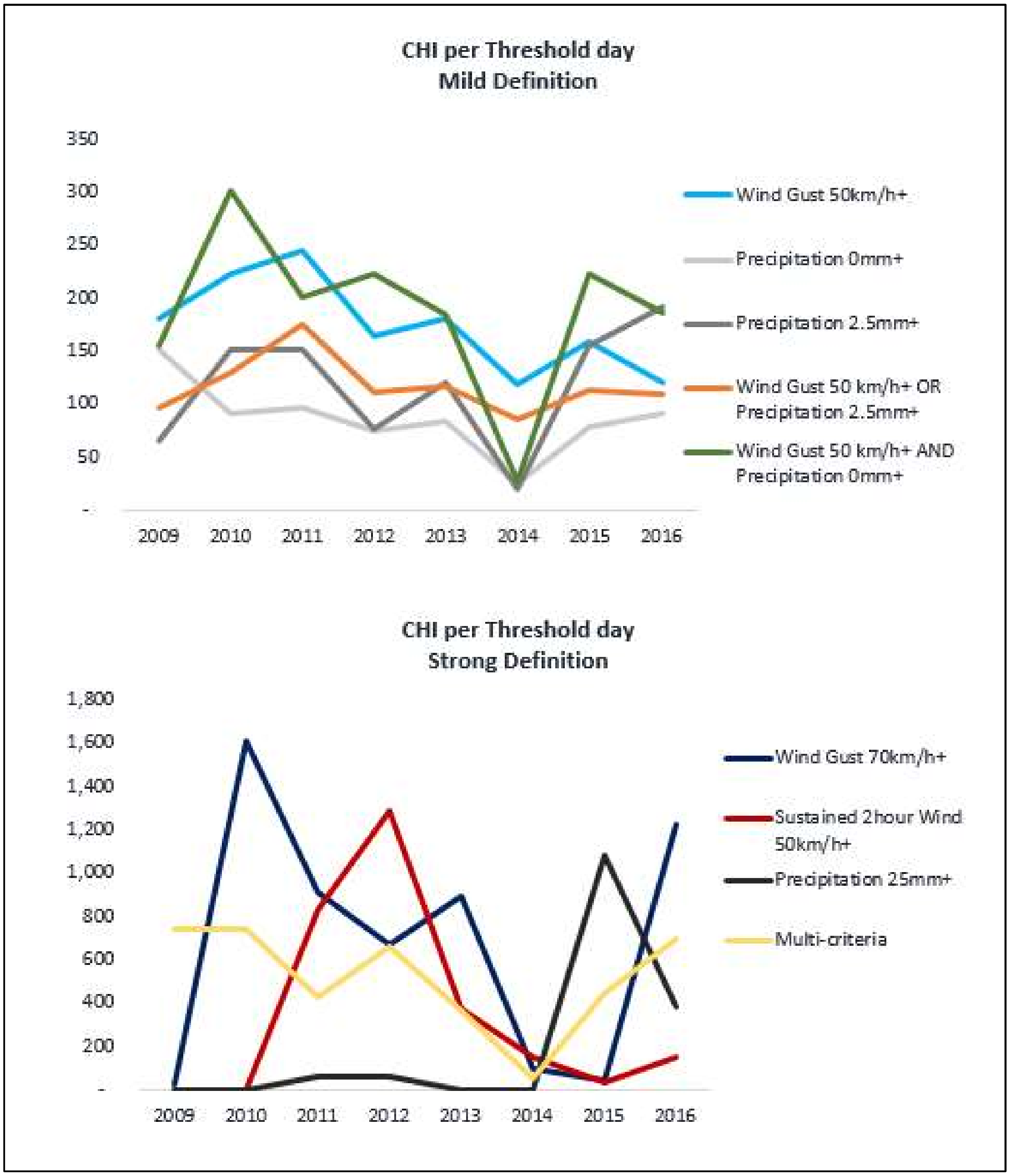


Figure A4 – Customers Interrupted (CI) per Threshold Days: 3-Year Moving Average *(as with CHI with poor weather threshold days, CI across most definitions decreases over time)*

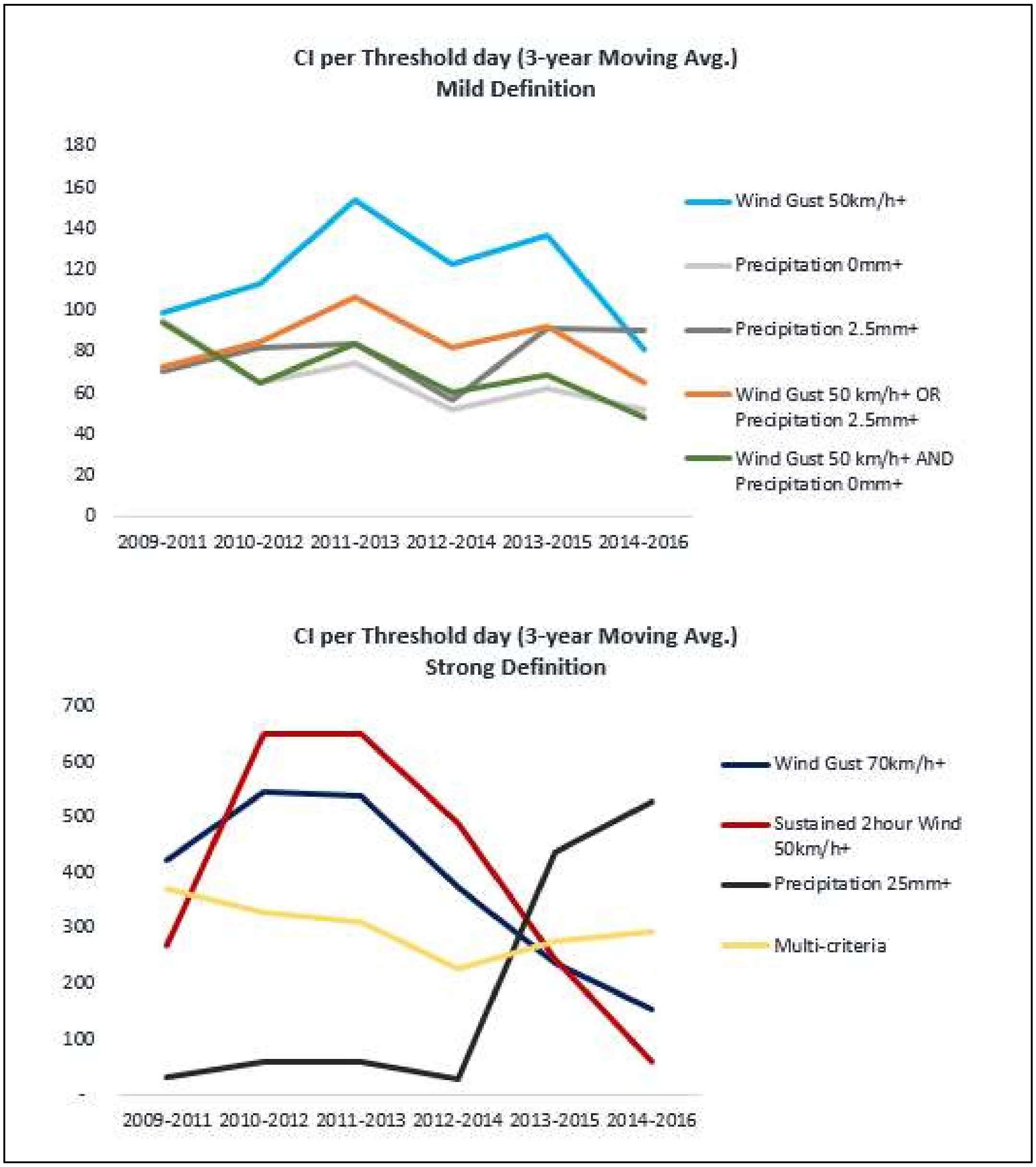


Figure A5 - Event Count per threshold day: 3-Year Moving Average. *(As with CHI and CI – the count of events occurring on "poor weather days" goes down over time)*.

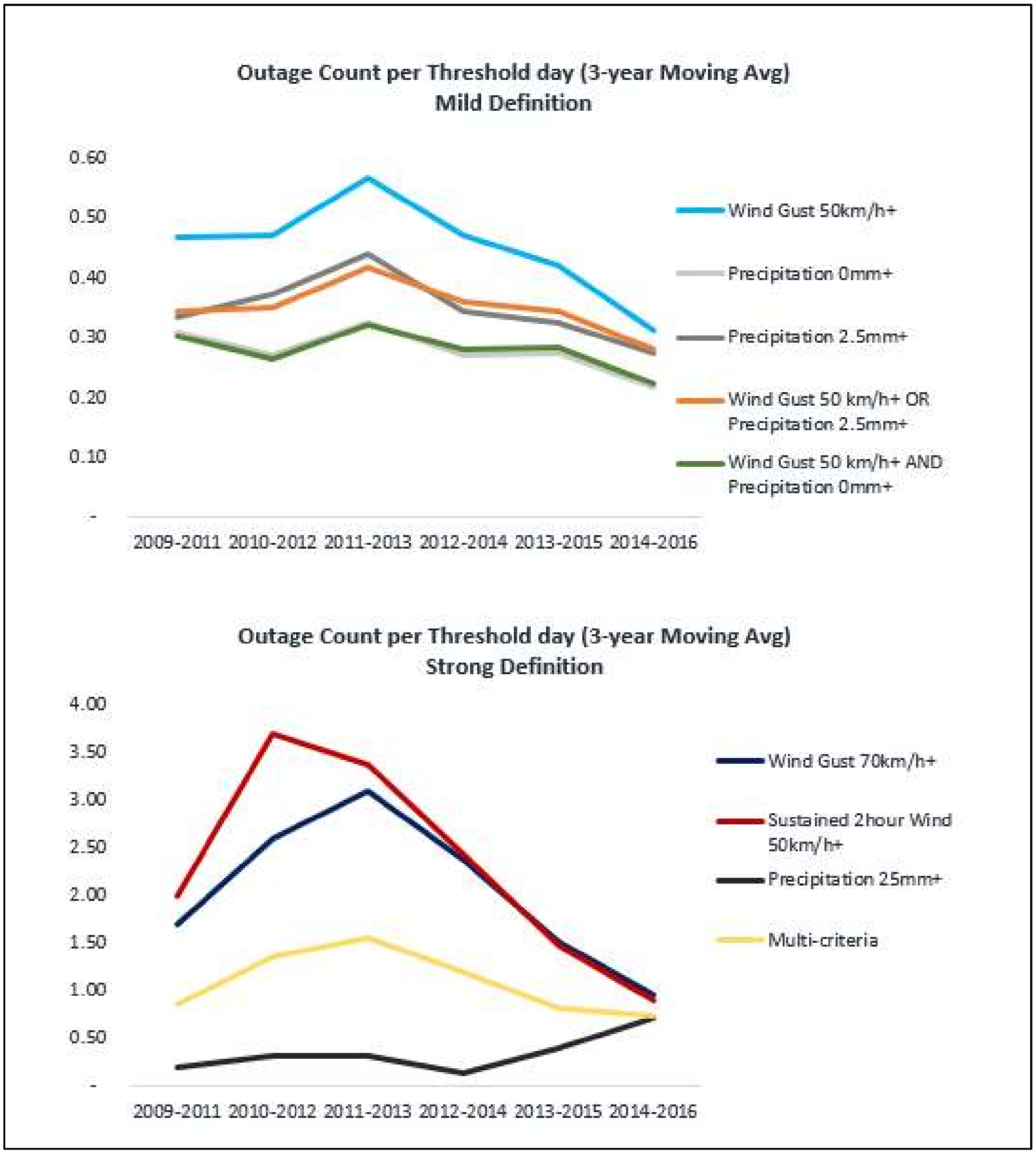


EXHIBIT 1 – ADMINISTRATION

<u>Interrogatory 1-Staff-4</u>

Engagement Survey
Ref: Exhibit 1, Tab 5, Schedule 1, page 3

Preamble:

Kingston Hydro retained UtilityPULSE to perform a third-party customer satisfaction survey in the fall of 2019 and again in the fall of 2021.

Question(s):

a) Please provide the engagement survey that was administered to customers.
b) Please explain how customer preferences were used to reshape Kingston Hydro's capital plan.

<u>Response</u>

a) See attached UtilityPulse surveys from 2019 and 2021.

b) Page 21 of the 2021 UtilityPULSE survey report identifies the following 6 priorities that Utilities Kingston should focus on:

1. Maintaining and upgrading equipment to ensure a safe and reliable electricity supply 90%

2. Investing to ensure that more frequent and severe weather events will cause less damage to distribution system 85%
3. Investing in projects to reduce the environmental impact of Utilities Kingston's operations 82%
4. Preventing data breaches and system disruptions due to cyberattack 82%
5. Investing more in the electricity grid to reduce outages 80%
6. Reducing response times to outages 80%

The 2021 survey report also states the following:

> "Utilities Kingston should take a look at their current strategic goals and assess whether any of the above contribute to said goals or what could be done to align any of the above mentioned programs/initiatives into Utilities Kingston's operational plans."

The development of the near term 2022 - 2023 capital plans presented in the DSP, was reinforced by the UtilityPULSE customer satisfaction surveys as follows:

1. Maintaining and upgrading equipment remains a key part of Kingston Hydros capital planning. System renewal expenditures representing 43% of the 2023 capital budget are the largest total capital expenditure by OEB category and will ensure a safe, reliable distribution system. The survey conducted with our customers has reinforced that this is important to our customers.
2. Kingston Hydro prioritizes overhead infrastructure upgrades based on their condition to mitigate risks and damage due to severe weather events. A recent report by Metsco studied the system reliability of the Kingston Hydro grid and determined that system reliability during poor weather events has improved. This

improvement in system reliability is attributed to the significant capital investments made by Kingston Hydro over the past 10 years.

3. Kingston Hydro plans to remove all distribution transformers containing PCBs by the end of 2025 to meet environmental regulations
4. Cybersecurity is critically important to Utilities Kingston and Kingston Hydro. Cybersecurity is ranked as the greatest risk within the enterprise risk management program. Among other priorities, the UtilityPulse survey highlighted "Preventing data breaches and system disruptions due to cyberattack 82%". This was helpful in reinforcing the importance cybersecurity has to the business as well as our customers. Capital dollars have been allocated for the purchase of software to help monitor and administer our cybersecurity program, software to help deploy cyber policies and monitoring of end point devices, and software upgrades for the tools that monitor the operational technology side of the business
5. Maintaining and upgrading equipment remains a key part of Kingston Hydros capital planning. System renewal expenditures representing 43% of the 2023 capital budget are the largest total capital expenditure by OEB category and will ensure a safe, reliable distribution system. The survey conducted with our customers has reinforced that this is important to our customers.
6. Kingston Hydro will, as a result of it's capital spend, maintain status quo on response times to outages which vary depending on the nature and cause of the outage.

Response to Ontario Energy Board (OEB)

Interrogatory 1-Staff-4 (a)

Attachment 1 of 1

(23rd Annual Electric Utility Customer Satisfaction Survey)

Utilities Kingston

23rd Annual Electric Utility Customer Satisfaction Survey

UtilityPULSE

Utilities Kingston

The purpose of this report is to profile the connection between Utilities Kingston and its customers.

The primary objective of the Electric Utility Customer Satisfaction Survey is to provide information to support discussions about improving customer care at every level in your utility.

The UtilityPULSE Report Card® and survey analysis in this report are intended to capture the state of mind or perceptions about your customers' need and wants – the information in this report will help guide your discussions for making meaningful improvements.

All comments and questions should be addressed to:

UtilityPULSE division, Simul Corporation

Sid Ridgley	David Malesich
President	Chief Research Officer
Email: sridgley@simulcorp.com	Email: david@utilitypulse.com

Continued Satisfaction and Rise of Increased Digital Communication

Nearly two years ago, the world was caught off-guard by the COVID-19 pandemic. While it may not be over quite yet, there seems to be light at the end of the tunnel, and a “new normal” appears to be emerging. There was fallout in many industries, but the pandemic has also brought about new changes to how the world conducts its business. Face-to-face communications and even telephone have decreased as more and more people opt to serve themselves online. Comfort and willingness to make purchases online, conduct online banking, and find answers to frequently asked questions have grown across the board.

Although e-commerce growth might not be as sky-high in 2020/21, online activities will continue to expand and accelerate far more than they did before pandemic-driven shutdowns and social distancing. Businesses have been more cognizant of online growth and technologies are being improved to meet the rising demand. The surge in accelerated digital transformation is expected to continue throughout the recovery from COVID-19, and electricity customers are no exception to this overall trend. Compared to before the pandemic, more electricity customers than ever before want to communicate via electronic means (e.g., email, text) with their utility. For example, customer preference for an email or text notification for an unexpected outage has grown by over 50% from 2019.

The sped-up transition to a digital world was not expected and not without its challenges. Companies, including utilities, have been forced to make changes to their websites and ensure that they can meet customers' changing needs and demands. Pre-authorized automated payments and e-billing have also increased in importance. Many digital options that were once considered 'nice to have' options have become widely expected standards. "Inbound" methods of communication are very expensive, so although challenging, especially at an accelerated pace, ensuring an effective self-service strategy can help reduce costs and ensure customers are satisfied.

Customers are showing increased comfort levels with technology, but now they are not always knowledgeable about what they can do or get online from their LDC website. Any changes or enhancements should be consistently communicated as well as be easy to navigate and understand.

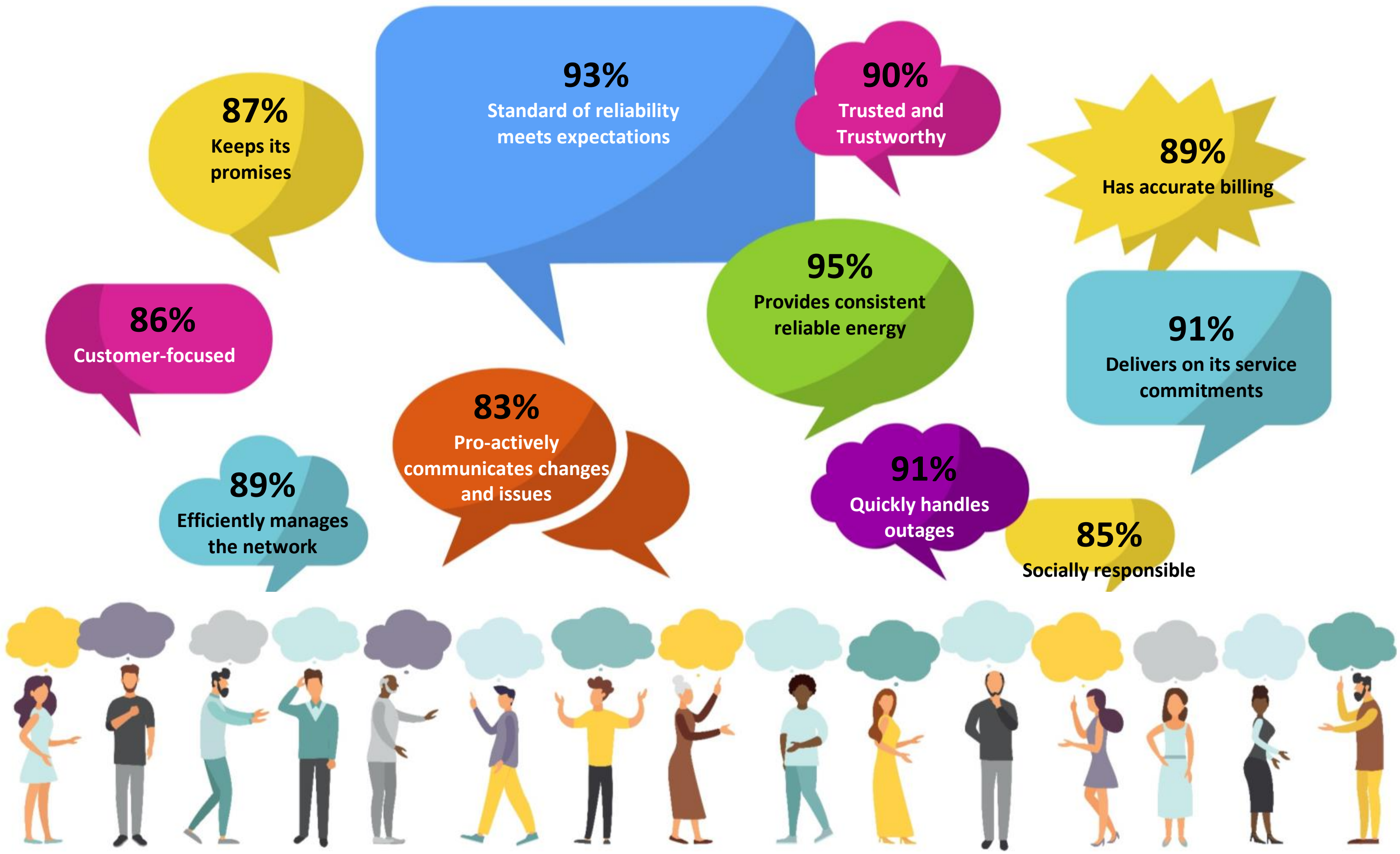
To better understand the self-service impact on utilities and track this metric going forward, a new question was added this year: "Before contacting your utility, did you visit the utility website to try to resolve your issue on your own, or to get more clarity on the issue before contacting the utility?" Prior to contacting the utility, 47% of Utilities Kingston's customers visited the website first to try to resolve their issue on their own or get more clarity.

Visited website to try to resolve issue on own, or get more clarity, before contacting utility

	Utilities Kingston	UP Database
Yes	47%	41%
No	53%	58%

Base: total respondents; small data sample; total respondents from the 2021 UtilityPULSE Database

The “COVID halo” continues. Scores were high last year, and people's utilities were one less worry on their plates during a terrible year. Scores remain high, which is very encouraging; for example, Utilities Kingston's satisfaction score is 96%, and ‘delivers on its service commitments to customers’ is 91%.



Base: total respondents with an opinion

Going forward, we recommend continuing your efforts toward improving online ease and contactless self-service strategies, which are necessary to maintain a positive customer experience. Despite an appetite for more self-service, this does not mean the death of traditional forms, such as telephone. What is continually changing— are the many ways in which utilities can engage with their customers. Therefore, utilities will have to offer a wide mix of options to satisfy a customer base that increasingly wants the flexibility to interact with their utility based upon their preferences and situation. The result of all of this technological advancement is that customers are more informed and connected than ever before. Customer engagement is no longer characterized by one-way, utility-initiated communication. It’s now a dynamic, multi-channel, two-way communication stream.

Customer Centric Engagement Index (CCEI)

Customer engagement is the emotional connection achieved by the ongoing interactions between a customer and the organization. Highly engaged customers are far more likely to support the LDC as it responds to changes than customers with little-to-no engagement. Highly engaged customers are less likely to complain publicly about disappointing shopping experiences, choosing to resolve issues with the company directly.

Utility Customer Centric Engagement Index (CCEI)

	Utilities Kingston	National	Ontario
CCEI	88%	83%	82%

Base: total respondents

Utilities Kingston has scored well on this index.

The Core Responsibilities

Survey respondents gave Utilities Kingston excellent operational and representative scores.

Core Operational Attributes	Utilities Kingston	National	Ontario
Provides consistent, reliable energy	95%	90%	90%
Quickly handles outages and restores power	91%	87%	87%
Has accurate billing	89%	87%	88%
Has a standard of reliability that meets expectations	93%	88%	88%
Makes electricity safety a top priority	90%	88%	89%

Base: total respondents with an opinion

Core Customer Service Quality Attributes	Utilities Kingston	National	Ontario
Deals professionally with customers' problems	91%	84%	84%
Is 'easy to do business with'	89%	84%	84%
Customer-focused and treats customers as if they're valued	86%	79%	79%

Base: total respondents with an opinion

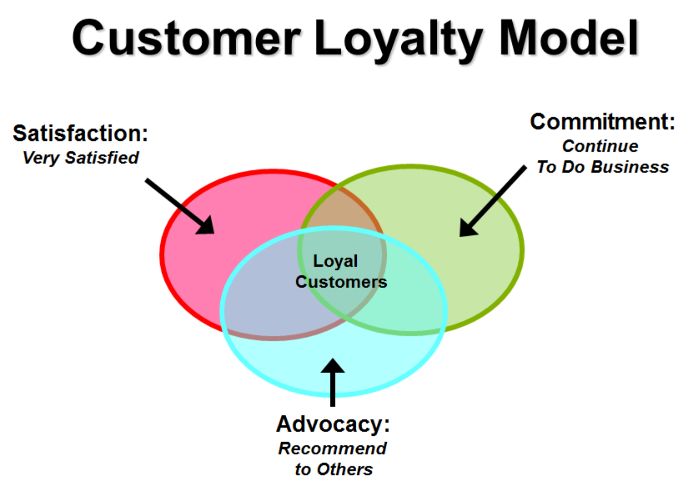
Customer Satisfaction

Measuring satisfaction is the bedrock, or starting point, for the creation of loyal customers. One must do the job as expected before there is an opportunity to emotionally connect in a positive way hence the need to focus on the overall customer experience. Customer satisfaction is an effectiveness measure (not an efficiency measure) on the historical relationship or delivery of services to customers.

SATISFACTION SCORES – Electricity customers' satisfaction			
Top 2 Boxes: 'very + fairly satisfied'	**Utilities Kingston**	**National**	**Ontario**
PRE: Initial Satisfaction Scores	96%	94%	93%
POST: End of Interview	94%	93%	92%

Base: total respondents

When it comes to the question of satisfaction, UtilityPULSE has designed the survey so that customers are asked twice, once at the beginning – this is to garner first impressions and set the tone for the survey, and again at the end – because now the respondent has context of what is being asked and is more aptly ready to address it in an informed state of mind.



Loyalty Groups – Customer Affinity

Customer loyalty (affinity) is an intangible asset with positive consequences or outcomes associated with it, no matter the industry. Data shows that Secure customers have fewer outages and billing issues than At Risk customers, i.e., those that hate the utility. In private industry, Loyalty is a behavioural metric; in a monopoly, it is an attitudinal metric.

Customer Loyalty Groups

	Secure	Favorable	Indifferent	At Risk
Utilities Kingston	38%	20%	39%	3%
National	29%	17%	47%	7%
Ontario	28%	16%	48%	8%

Base: total respondents

What is the importance of Net Supporter Score™ [NSS] for LDC's?

The NSS is a metric which measures how likely customers could ***support*** policy changes, actions, programs, or service changes or enhancements the LDC wishes to make. The NSS is a metric developed to help the organization, and its people, continue on a path of improving customer experiences, whether those experiences are in-person, over the telephone, online, or a combination. In a nutshell, the NSS reflects the net number of customers who have confidence in the LDC to continue to serve in their best interests.

Net Promoter Score™ (NPS)

The Net Promoter Score™ (NPS) is a popular metric that measures how likely customers are to recommend a business's products and services. Your NPS score, when compared to the benchmarks, can provide some insight into the affinity level of survey respondents towards your brand image. The NPS metric was developed by and is a registered trademark of Fred Reichheld, Bain & Company, and Satmetrix in 2003.

Utilities Kingston has a Net Supporter Score™ (NSS) of 35%**.** The Ontario benchmark is 20%, and the UtilityPULSE database average is 26%.

Net Supporter Score™ (NSS)			
	Opportunity Range <20%	**Good Range 20-40%**	**Very Good Range 40+%**
Utilities Kingston	--	35%	--
Ontario Benchmark	--	20%	--

Base: total respondents; range bands represent 2021 data and can change year-to-year

Utilities Kingston has a Net Promoter Score™ (NPS) of 44%**.** The Ontario benchmark is 24%, and the UtilityPULSE database average is 35%.

Net Promoter Score™ (NPS)			
	Opportunity Range <5%	**Good Range 5-25%**	**Very Good Range 25+%**
Utilities Kingston	--	--	44%
Ontario Benchmark	--	24%	--

Base: total respondents; range bands represent 2021 data and can change year-to-year

Issues: Billing and Blackouts, the “Killer B’s”

The reliable and efficient delivery of electricity to homeowners and businesses is an essential service – especially during the personal and professional challenges of the past couple of years. Customers are comforted by the fact that standards for keeping the lights on and getting them up and running quickly have not deteriorated.

Problems: Blackouts

Percentage of Respondents indicating that they had a Blackout or Outage problem in the last 12 months			
	Utilities Kingston	**National**	**Ontario**
2021	27%	39%	36%

Base: total respondents

Inaccurate bills cause angst and, in some cases, anger, which is why accurate billing remains an important service imperative for all utilities. Utilities Kingston performs billing well despite the number of changes in pricing, including the need to communicate about various financial support options.

Problems: Billing issues

Percentage of Respondents indicating that they had a Billing problem in the last 12 months			
	Utilities Kingston	**National**	**Ontario**
2021	9%	4%	6%

Base: total respondents

Customer Service

Customers are more concerned about outcomes and want their issues, problems, or concerns to be dealt with in a professional, knowledgeable, and timely manner. Respondents were asked about six aspects of their more recent experience.

Satisfaction with Customer Service			
Top 2 Boxes: 'very + fairly satisfied'	**Utilities Kingston**	**National**	**Ontario**
The time it took to contact someone	76%	71%	66%
The time it took someone to deal with your problem	65%	69%	69%
The helpfulness of the staff who dealt with you	65%	73%	75%
The knowledge of the staff who dealt with you	78%	76%	75%
The level of courtesy of the staff who dealt with you	84%	85%	88%
The quality of information provided by the staff who dealt with you	71%	79%	75%

Base: total respondents who contacted the utility; small data sample (n=49)

Communication channels preferred by customers to receive notice about Billing Issues (Other than payments owed)

UtilityPULSE database information tells us that the preferred channel for communications can change based on the type of issue, e.g., a billing issue versus an unplanned outage issue. Two things we believe LDCs must be mindful of:

1. The preferred communication channel is determined by the customer, not by the LDC.

2. There is a higher expectation that the LDC will become more "outbound" communications driven. UtilityPULSE data from findings in the Fall 2021 survey show the degree to which email and text are customers' preferred or primary method for their LDC to contact them about billing issues.

Preferred method of communication to receive notice of a Billing Issue (Other than payments owed)	
	Ontario LDCs
Telephone	45%
Voice Mail	1%
Text	10%
Email	41%
Don't know	1%

Base: An aggregate of respondents from 2021 participating LDCs

LDCs, for the most part, are primarily set up as "inbound" problem solvers and communicators. The notion or idea that the LDC needs to become more "outbound" with personalized channel communication is a challenge from an organizational culture and operations perspective. Yet, if the LDC doesn't become more outbound driven, it will have to invest more into inbound methods for solving problems – which is extremely expensive. As mentioned, increased focus on website design and self-service strategies will help alleviate potential future costs and is on trend to customer expectations.

Our data show "older" respondents have a heavier desire to communicate via the telephone, but youths, especially those in the 18-34 range, are far more comfortable getting and receiving information electronically. Preferences are changing and will continue to change as a result of previous pandemic-driven lockdowns and increased social distancing. The UtilityPULSE database shows about 1 in 3 respondents in the 55+ age category prefer to receive notice about a billing issue via electronic means. In comparison, almost 2 in 3 respondents in the 18-34 age range prefer the electronic channels of email and text.

Communication during Unexpected Outages

In times of emergency, be they extreme weather events or major equipment failures that cause blackouts and unplanned outages, customer communication can help customers understand what to expect next and when disrupted electricity service might be restored. Early and effective communication helps increase confidence in and credibility of the electricity service provider.

Findings in the UtilityPULSE data show the importance of text and email, as preferred communication channels their LDC should use ***during an unexpected outage.*** Base: An aggregate of respondents from 2021 participating LDCs

Preferred communication channel LDC should use during an UNEXPECTED Outage	
	Ontario LDCs
Text message alert	49%
Email alert	38%
Recorded telephone message alert	29%
Outage map on utility's website	18%
Mobile APP alert	15%
Social media alert on Twitter or Facebook, etc.	14%
A toll-free outage line	12%
Outage map posted on mobile APP	2%
Smart assistant alert such as Alexa or Google	1%

UtilityPULSE data for 2019 shows that email was 26% and text was 31% as preferred channels. 2021 data shows a substantive change in just 2 years.

Communication during Planned Outages

UtilityPULSE data show the importance of email and text alerts as preferred communication channels their LDC should use ***during a planned outage;*** times when the utility needs to undertake work on their network (poles, wires, meters, transformers, substations, etc.) to maintain a safe and reliable supply.

Preferred communication channel LDC should use during a PLANNED Outage

	Ontario LDCs
Email alert	47%
Text message alert	39%
Recorded telephone message	25%
Hand delivered notice	20%
Outage map on the utility's website	15%
Mobile APP alert	13%
A toll-free outage line	12%
Social media alert on Twitter, Facebook, etc.	12%
Outage map on mobile APP	11%
Other	1%
Email invite that syncs to your calendar with the outage duration	0%

Base: An aggregate of respondents from 2021 participating LDCs

Email and text alerts are very low effort methods for getting information. Both have grown as preferred channels in 2021 vs. 2019

Customers expect that the companies they deal with will be "pro-active" communicators. They know they don't know everything, but they are hopeful that the companies they deal with will provide them with timely information. The reality is, Ontario LDCs have been pro-active communicators over the past couple of years.

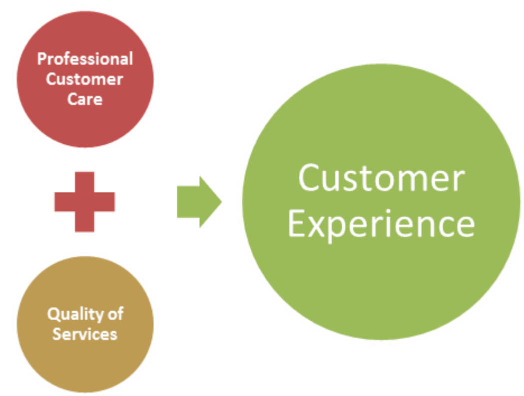
Utilities Kingston received a respondent score of 83% for the attribute *"is pro-active in communicating changes and issues which may affect your electricity service."*

We recommend that LDCs focus their investing on outbound communication channel technology and easy methods to look-up information or to get service because time-pressed customers appreciate when an organization is 'easy to do business with' – on this attribute, Utilities Kingston received a respondent score of 89%.

Customer Experience Performance rating (CEPr)

Every touchpoint with customers on the phone, email, text, website, or in-person influences what customers think and feel about the organization. When an interaction with a customer meets their expectation, the opportunity to build loyalty (affinity) and support is strong. When the experience is a negative one, customers often conclude that the organization doesn't care.

A positive experience today sets up the perception that future interactions will also be excellent.



Customer Experience Performance rating (CEPr)			
	Utilities Kingston	**National**	**Ontario**
CEPr: all respondents	90%	84%	85%

Base: total respondents

The CEPr rating suggests that a very large majority of customers have a belief that they will have a good to excellent experience dealing with Utilities Kingston professionals.

From an image point-of-view, Utilities Kingston received very good scores for the attributes “keeps its promises to its customers and the community” and “overall the utility provides excellent quality services”.

Customer Effort & Experience Score™ (CEES)

Customers are time-pressed, and they want transactions related to getting questions answered or solving problems to be easy and fast. Customers dislike non-seamless handoffs when they have to deal with different people or departments to address their issues, and they dislike a slow response to their problem or concern. Customers also dislike “surprises,”; which is why they expect their utility to communicate with them pro-actively and, when needed, be ‘easy to do business with’.

The CEES as a metric is designed to help the organization remain focused on making things easy and fast for customers. The goal is to encourage improvements in all aspects of the customer’s journey from initial contact to completion of the issue. The central idea of CEES is about getting the most from your investments in people and technology.

Utilities Kingston has rated a Customer Effort & Experience Score (CEES)™ of 45%**.** The Ontario benchmark is 25%, and the UtilityPULSE database average is 34%.

Customer Effort & Experience Score (CEES)			
	Opportunity Range <15%	**Good Range 15-35%**	**Very Good Range 35+%**
Utilities Kingston	--	--	45%
Ontario Benchmark	--	25%	--

Base: total respondents; range bands represent 2021 data and can change year-to-year

The Customer Effort & Experience Score™ is about encouraging your people to figure out how to speed up and simplify interactions. It is designed to encourage dialogue with all areas of the business to reduce customer effort. Busy, time-pressed customers consider CEES a bonafide reflection of the business. Most importantly, it has a direct correlation to customer satisfaction, loyalty, and NSS.

Our experience suggests that low-effort experiences, i.e., "easy" and "fast," are highly correlated to customer affinity (loyalty). In contrast, high-effort experiences are correlated to low overall satisfaction and low company image.

UtilityPULSE Report Card®

The purpose of the UtilityPULSE Report Card is to provide electric utilities with a snapshot of performance – on the criteria customers deem to be important.

Utilities Kingston's UtilityPULSE Report Card®

Performance

	CATEGORY	Utilities Kingston	National	Ontario
1	**Customer Care**	**A**	**B+**	**B+**
	Price and Value	A	B+	B+
	Customer Service	A	B+	A
2	**Company Image**	**A**	**A**	**A**
	Company Leadership	A	A	A
	Corporate Stewardship	A	A	A
3	**Management Operations**	**A+**	**A**	**A**
	Operational Effectiveness	A+	A	A
	Power Quality and Reliability	A+	A	A
	OVERALL	**A**	**A**	**A**

Base: total respondents

Priority Planning

Looking at a time horizon spanning five years, customers were asked to weigh in on the priority of Utilities Kingston undertaking various projects or initiatives.

Priority Planning within the next 5 years

Top 2 Boxes: 'very high + high priority'	Utilities Kingston	Ontario LDCs
Maintaining and upgrading equipment to ensure a safe and reliable electricity supply	90%	92%
Investing to ensure that more frequent and severe weather events will cause less damage to distribution system	85%	86%
Investing in projects to reduce the environmental impact of Utilities Kingston's operations	82%	75%
Preventing data breaches and system disruptions due to cyberattack	82%	84%
Investing more in the electricity grid to reduce outages	80%	83%
Reducing response times to outages	80%	84%
Investing more in vegetation management (clearing trees and brush around powerlines for increased safety and reliability)	68%	75%
Increasing the use of e-billing and paper-free communication options to reduce environmental impact and improve cost-effectiveness	67%	65%
Educating the public as it relates to electricity safety	65%	69%
Burying overhead wires	58%	62%
Developing a SMART phone application to allow you to view your electricity use and pay your bill	51%	52%
Providing sponsorships to local community causes	48%	52%
Providing more self-serve services on the website	44%	45%
Increasing the use of social media (such as Twitter, Facebook, and others)	24%	27%

Base: total respondents / An aggregate of respondents from 2021 participating LDCs

Respondents for Utilities Kingston identified the following projects/initiatives as top items which Utilities Kingston should focus attention and resources:

HIGH PRIORITY

1.	**Maintaining and upgrading equipment to ensure a safe and reliable electricity supply**	90%
2.	**Investing to ensure that more frequent and severe weather events will cause less damage to distribution system**	85%
3.	**Investing in projects to reduce the environmental impact of Utilities Kingston's operations**	82%
4.	**Preventing data breaches and system disruptions due to cyberattack**	82%
5.	**Investing more in the electricity grid to reduce outages**	80%
6.	**Reducing response times to outages**	80%

Utilities Kingston should take a look at their current strategic goals and assess whether any of the above contribute to said goals or what could be done to align any of the above mentioned programs/initiatives into Utilities Kingston's operational plans. UtilityPULSE data shows from 2019 that developing a smart phone app has grown in priority from 46% to 52%. Providing more self-serve options has changed from 37% to 45%. More importantly, 84% said that preventing data breaches and system disruptions due to cyberattack was a priority.

Credibility & Trust Index

For most Ontario LDCs, over 40% of the customer base has been affected by the events of the past couple of years. As such, in a world with heightened unknowns, people will look for credible organizations that can be trusted. 90% of respondents agree strongly or somewhat that Utilities Kingston is trusted and trustworthy. Your Credibility & Trust score is 88%, while the Ontario and National benchmarks sit at 84%.

Numbers at a Glance for 2021

	Utilities Kingston	National	Ontario
Customer Satisfaction: Initial	96%	94%	93%
Customer Satisfaction: Post	94%	93%	92%
Would recommend	87%	83%	82%
Customer Experience Performance Rating (CEPr)	90%	84%	85%
Customer Centric Engagement Index (CCEI)	88%	83%	82%
Credibility & Trust Index	88%	84%	84%
UtilityPULSE Report Card©	A	A	A

As with the previous 23 years, the number one suggestion, by a wide margin, has been "better prices". Price will always be top of mind for customers. For 2021, the second-highest suggestion was "better communications." The third suggestion was "simplified billing." Customers want increased ease, and we have seen that many want the ability to self-serve. These results make sense in light of an increasing push toward and need for digitization.

People want to be recognized as individuals AND get what they perceive to be good value. By allowing customers to choose whether they want to receive communication notices via email, text, or snail mail, etc., The more specific you can be with your communications, the more likely you are to engage your customers and build an ongoing relationship with your brand.

We recommend that LDCs continue to work as fast as possible to digitize service. The goal is to provide options for customers to access help. As stated, customers who were previously resistant to doing things online are no longer resisting; they are adapting to using online methods with much more enthusiasm. This is the “new normal” and one that must be embraced and pro-actively addressed to meet the tastes and demands of customers better.

It is true the customer base still has lots of concerns and worries, such as getting ill or having a family member or friend get ill. Losing their job, or having a reduced pay cheque, or product shortages, etc. Fortunately, Utilities Kingston is not at the top of the list of day-to-day concerns. 89% believe Utilities Kingston ‘efficiently manages the electricity system’ - it continues to be a source of stability and reliability.

Your survey was conducted from October 13 to October 21, 2021, and is based on 405 one-on-one telephone interviews with residential and small commercial customers who pay or look after the electricity bill. In addition, survey findings for Utilities Kingston are enhanced with the inclusion of data from our UtilityPULSE database and the independently produced Ontario and National Benchmarks.

The pandemic may not be fully over, but we are seeing some light. Your customers continue to be satisfied with the operations and image of Utilities Kingston has done during this pandemic. One key for maintaining excellent scores resides in the next steps you take to ensure a continued positive customer experience in an increasingly digital world.

Simul/UtilityPULSE

Sid Ridgley

sridgley@simulcorp.com

David Malesich

david@utilitypulse.com

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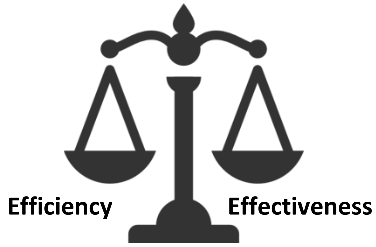
Satisfaction (pre & post)

As stated multiple times over many years, measuring satisfaction is an important starting point for creating loyal customers. However, it is a misnomer to conclude that highly satisfied customers are also customers with a high affinity or loyalty quotient. One can be satisfied but not necessarily loyal. But it is proper to conclude that the LDC (its people) must do the job as expected and required before there can be a positive emotional connection.

We've stated in the past, a focus on satisfaction prompts an organization to continue to evolve in ways that make sense to those who pay the bills. A focus on satisfaction is a focus on effectiveness in the delivery of service to the customer. Satisfied customers who trust their LDC may be more likely to seek advice, i.e., energy efficiency methods, and be more receptive to important messages, i.e. safety, new capital projects, etc.

About ratings/measures:

- Satisfaction is not a program; it is an outcome.
- ***Efficiency*** *is about achieving objectives with the minimum amount of people, time, money, and other resources; doing things right; resource usage*
- ***Effectiveness*** *ratings are measures keeping the organization and its people more future-focused than efficiency ratings; doing the right things; goal attainment*



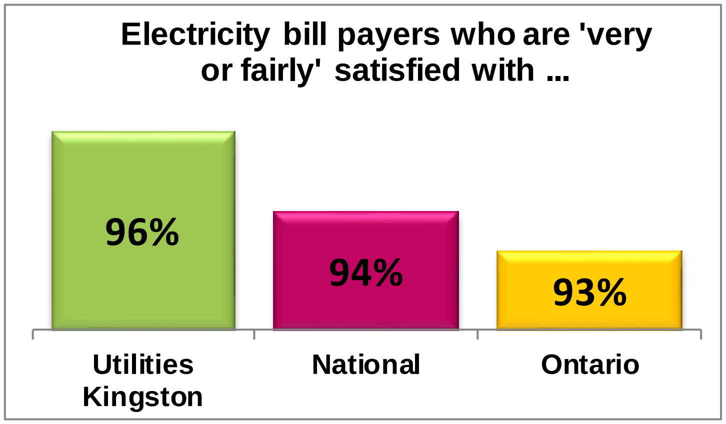
Finding the right balance between efficiency and effectiveness measures is difficult.

Efficiency ratings won't lead to satisfaction, but they can lead to dissatisfaction. Taking 90 seconds to answer the phone will create an agitated customer who, for the most part, starts off being dissatisfied with the service – before you've even had a chance to deal with or solve their problem. Answering the phone in 20 seconds but not solving the customer's problem will not ameliorate the customer's perception of the transaction.

Customer expectations of their electricity LDC have evolved past the "provide electricity reliably, safely, and billed both accurately with fair pricing." They do expect their LDC to be ethical, forward-thinking, competent, and trustworthy.

- **Satisfaction** happens when utility core services meet or exceed customers' needs, wants, or expectations.

- **Loyalty** occurs when a customer makes an emotional connection with their electric utility on a diverse range of expectations beyond core services.



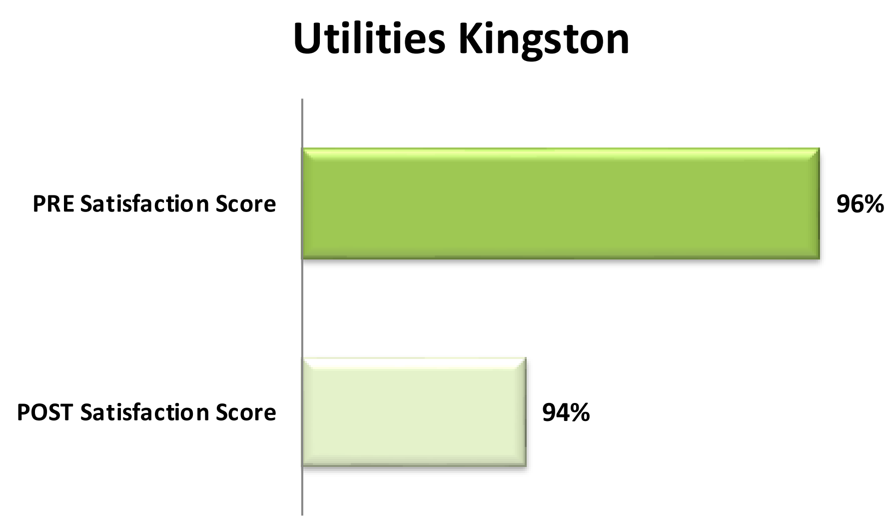
Base: total respondents

Satisfaction alone does not make a customer loyal; a willingness to commit and advocate for a company, along with satisfaction, identifies the three basic customer attitudes which underpin loyalty profiles. While satisfaction is an important component of loyalty, the loyalty definition needs to incorporate more attitudinal and emotive components.

Electricity bill payers who are 'very or fairly' satisfied with…					
	2021	**2020**	**2019**	**2018**	**2017**
Utilities Kingston	96%	-	96%	-	92%
National	94%	96%	93%	91%	90%
Ontario	93%	95%	92%	91%	85%

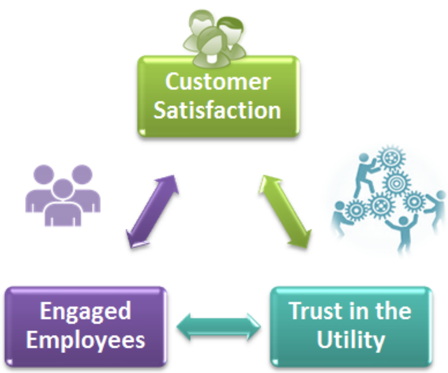
Base: total respondents / (-) not a participant of the survey year

In the Simul/UtilityPULSE Customer Satisfaction survey, the overall satisfaction question is asked both at the beginning (PRE) and the end (POST). Asking the general satisfaction question at the start of the survey avoids bias, obtaining a spontaneous rating. This allows measurement of customers' overall impressions of the utility before prompting them to think of specific aspects of the relationship. After asking about specific aspects of the customer experience, we gain a more *considered* (or conditioned) response.



Base: total respondents

As with any enterprise, Utilities Kingston is obligated to satisfy its customers. But the rewards for satisfying customers go far beyond "obligation." Customers with high levels of satisfaction handle problems far better than customers with low satisfaction. Stronger relationships with customers generate higher levels of involvement and participation. For employees serving customers who are very satisfied, those interactions are more enjoyable s than those with customers who are very dissatisfied. Satisfied and engaged employees who work in an organizational culture that promotes service excellence, with empowerment, is an important key for completing the job both efficiently and effectively.



SATISFACTION SCORES – Electricity customers' satisfaction			
Top 2 Boxes: 'very + fairly satisfied'	**Utilities Kingston**	**National**	**Ontario**
PRE: Initial Satisfaction Scores	96%	94%	93%
POST: End of Interview	94%	93%	92%

Base: total respondents

A mutual correlation exists between employee and customer attitudes and loyalty. Employees who are trained well, have the right tools, and are focused on successful outcomes for customers contribute significantly to the customers' perception of their utility. There is a direct, irrefutable link between empowered and engaged employees and customer satisfaction – after all -- *your employees are part of your brand, and they deliver the promises you make.*

Utilities Kingston

SATISFACTION SCORES – Electricity customers' satisfaction		
Top 2 Boxes: 'very + fairly satisfied'	**Residential**	**Commercial**
Satisfaction Scores	96%	95%

Base: total respondents

SATISFACTION SCORES – Electricity customers' satisfaction [kwh usage]			
Top 2 Boxes: 'very + fairly satisfied'	**kWh Group 1**	**kWh Group 2**	**kWh Group 3**
Satisfaction Scores	95%	96%	97%

Base: total respondents

SATISFACTION SCORES – Electricity customers' satisfaction [Income]			
Top 2 Boxes: 'very + fairly satisfied'	**<$30K**	**$30 – 75K**	**$75K +**
Satisfaction Scores	96%	98%	95%

Base: total respondents

Customer Service

As written in previous years, given the rapidly expanding availability and use of technology, finding an appropriate balance between automated self-service and human-interactive service is a huge challenge for all involved in providing service to customers. Customer Service is about the experience your customers have with your utility, your products, and your service – regardless of the channel used for delivering customer service. The goal is to ensure that your customers receive high-quality customer service and an experience that meets or exceeds their expectations - on every interaction with the LDC.

Given the increased complexity of delivering customer service, we have seen a shift towards a stronger focus on the touchpoints which create the customer experience.

Most of us want the same things when we are customers: We want to be treated with respect. We want to be listened to. We don't want to be bounced around or ignored, or treated as inferior. The customer experience is largely defined by the outcomes generated when customers have a need, want to solve a problem, or want answers to issues or concerns they face.

With more technology, there will be more shifting of calls away from the call centre. However, the volume of calls that remain are and will be more complex and challenging. We're already witnessing the fact that calls are taking longer to deal with customer issues.

Customers are more concerned about outcomes, and they want their issue, problem, or concern to be dealt with in a professional, knowledgeable, and timely manner. Respondents were asked about six aspects of their most recent experience with a representative from Utilities Kingston.

- Information – the quality of the information provided
- Staff attitude – the level of courtesy
- Professionalism – the knowledge of the staff
- Delivery – helpfulness of the staff
- Timeliness – the length of time it took to get what they needed
- Accessibility – how easy it was to contact someone

Base: total respondents who contacted the utility; small data sample (n=49)

Satisfaction with Customer Service			
Top 2 Boxes: 'very + fairly satisfied'	**Utilities Kingston**	**National**	**Ontario**
The time it took to contact someone	76%	71%	66%
The time it took someone to deal with your problem	65%	69%	69%
The helpfulness of the staff who dealt with you	65%	73%	75%
The knowledge of the staff who dealt with you	78%	76%	75%
The level of courtesy of the staff who dealt with you	84%	85%	88%
The quality of information provided by the staff who dealt with you	71%	79%	75%

Base: total respondents who contacted the utility; small data sample (n=49)

Overall satisfaction with most recent experience			
	Utilities Kingston	**National**	**Ontario**
Top 2 Boxes: 'very + fairly satisfied'	67%	78%	74%

Base: total respondents who contacted the utility; small data sample (n=49)

Every interaction with a customer is an opportunity to generate higher levels of affinity. It is fool-hardy to view the ratings shown above as ratings for the "call-centre" because every person in Utilities Kingston interacts with a customer or supports those who do have person-to-person contact with a customer. Empowerment is the backbone of the service recovery principle. In the face of error or problems, acting quickly and decisively, being empowered, and turning a dissatisfied customer into a satisfied one tends to have a positive impact.

Customer Focus – Service Quality

Current measures in the LDC scorecard are: New Residential Services Connected on Time; Scheduled Appointments Met on Time; and Telephone Calls Answered on Time. These are good examples of efficiency measures, as all are time-based. Showing up on time may not create satisfaction (in fact, it is what is expected); not showing up on time will cause dissatisfaction.

UtilityPULSE findings from working with many LDCs over the past few years indicate it is much harder to get great ratings from customers who may not know much about their LDC's standards for service. Despite this, service quality ratings for Utilities Kingston are very good compared to the Ontario benchmark.

Other dimensions of Service Quality that customers value include:

Core Customer Service Quality Attributes

Top 2 boxes, 'strongly + somewhat agree'	Utilities Kingston	National	Ontario
Deals professionally with customers' problems	91%	84%	84%
Customer-focused and treats customers as if they're valued	86%	79%	79%
Is a company that is 'easy to do business with'	89%	84%	84%

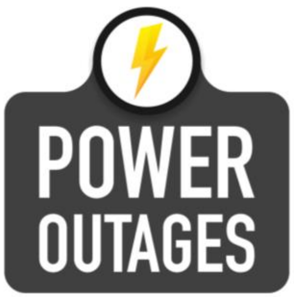
Base: total respondents with an opinion

We live in an imperfect world, so mistakes are bound to happen. In the LDC world, not all customer problems are mistakes; some are externally driven. Nonetheless, customers expect professionalism when interacting with "their" LDC.

Bill Payers' Problems and Problem Resolution

As previously written over multiple years, we call blackouts (outages) and billing problems the "Killer B's," the two issues most likely to cause grief to utility customers.

At one time, if the power went off for a few minutes, it was considered annoying and inconvenient. However, for most people, a power outage is now unbearable with the onset of computers and smart appliances in homes and businesses. Customers have little tolerance for an interruption in their flow of electricity.



27% of Utilities Kingston respondents claimed they experienced an outage problem in the past 12 months.

Like it or not, there will be times when the power goes off – and for reasons beyond the control of the LDC.

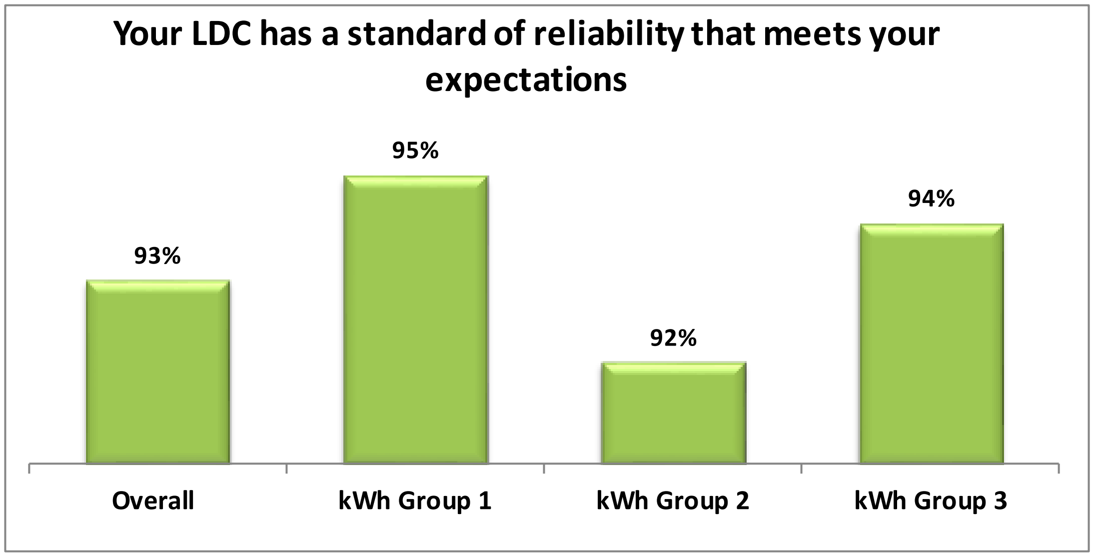
How many outages have you had in the last 12 months	
	Utilities Kingston
One	24%
Two	18%
Three	18%
More than three	41%
Don't know	0%

Base: total respondents who contacted the utility

Percentage of Respondents indicating that they had a Blackout or Outage problem in the last 12 months			
	Utilities Kingston	National	Ontario
2021	27%	39%	36%
2020	-	40%	43%
2019	18%	44%	45%
2018	-	39%	44%
2017	25%	37%	38%

Base: total respondents / (-) not a participant of the survey year

93% of Utilities Kingston respondents agree ('strongly + somewhat') the utility's standard of reliability is consistent with their expectations.



Base: total respondents

For nearly every business, the simple act of collecting payments from customers is quite complex. Organizations want to make it easy and convenient for customers to pay, so they offer multiple choices of payment types and channels. However, making it easy for the customer often makes it more complex—and costly—for the business and is certainly not without its problems or flaws.

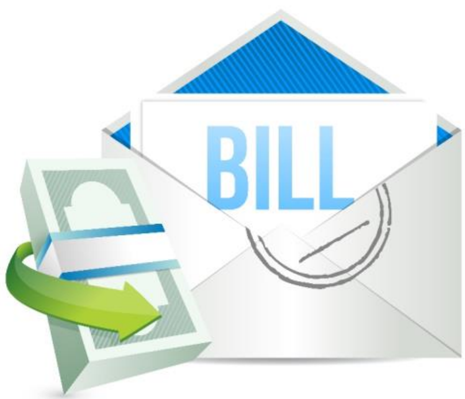
Percentage of Respondents indicating that they had a Billing problem in the last 12 months			
	Utilities Kingston	National	Ontario
2021	9%	4%	6%
2020	-	5%	6%
2019	7%	9%	9%
2018	-	9%	9%
2017	17%	12%	15%

Base: total respondents / (-) not a participant of the survey year

The impact of poor billing on a utility's business is considerable in terms of costs incurred handling customer queries and complaints. The quality of billing remains a driving force behind managing customer satisfaction and can help utilities reduce costs associated with customer service. By reducing the total number of calls to a utility by providing accurate, easily understood bills, a utility stems the flow of billing-related complaints into its call-centre. However, customers have a different definition than their utility as to what constitutes a billing problem.

Types of Billing Problems	
	Utilities Kingston
Did not receive the bill	19%
Owed too high	12%
Bill difficult to understand	8%
Bill arrived late	8%
Wrong information on bill	8%
Understanding how the bill is calculated	8%
Online billing issues	8%
Complaint about rates or charges	4%
Understanding pricing	4%
Payment deferral	4%
Subsidies	4%
Equal billing	4%
Missed payment	4%
Issues with automatic/direct payment	4%

Base: total respondents with billing problems



47% of Utilities Kingston respondents visited the utility website to try on their own to either resolve or get more clarity on the issue of concern before attempting to contact the utility.

Did you try to contact your electric utility about any issues over the past 12 months?

33%

66%

Base: total respondents

How many times did you contact your utility?	
	Utilities Kingston
One	29%
Two	29%
Three	8%
More than three	31%
Don't know	2%

Base: total respondents who contacted the utility

- 34% of Utilities Kingston respondents contacted the utility about an outage problem;
- 52% of Utilities Kingston respondents contacted the utility about a billing problem;
- 26% of Utilities Kingston respondents contacted the utility about a problem other billing or an outage.

Communication methods used to contact local utility	
	Utilities Kingston
Telephone	84%
Email	12%
The utility's website	8%
In-person	6%
Social media i.e. Twitter, Facebook	2%
Mail	2%
Live Chat	0%

Base: total respondents

Providing communication platforms that are effective and meet customers' needs is key to improving the customer experience. To do this, Utilities Kingston must understand how customers communicate with you, and how they would like Utilities Kingston to communicate with them in future. Knowing this will allow Utilities Kingston to: allocate resources where they are most needed; tailor services to meet customers' needs; and, identify where improvements can be made.

First Contact Resolution (FCR) rates are an important metric for improving call center performance. The first step in improving "FCR" is to survey your front-line customer touchpoints and understand what kind of assistance and information customers are seeking in these situations. Once you clearly understand what kinds of interactions are taking place at each of your initial customer touchpoints, you can then improve those interactions.

Percentage of Respondents who contacted their utility and had their problem solved in the last 12 months	
	Utilities Kingston
Yes	73%
No	24%

Base: total respondents with a problem who contacted their utility

Communication when there is an Issue

Utilities need to know what response they are seeking from customers when planning their communications and outreach. Sending inserts with monthly bills that provide information to a customer is passive and not very effective. Although your customer audience is captive, a poorly targeted message is often ignored. Unless a customer is actively searching for it, posting information on a website will likely not be found. Email blasts and social media campaigns will reach customers but may not necessarily lead to action. Such messages are typically read when in transit or multitasking, making them an afterthought. So, it often takes several pushes for these messages to resonate before action is taken. Successful marketing and messaging are about keeping communications simple, consistent, and continually reinforced.

Communication channels preferred by customers to receive notice about Billing Issue (Other than payments owed)

Billing issues have long been a major cause of customer inquiry and complaint. Not only are bills a key part of an LDC's revenue management process, but they're also an essential element and touchpoint in their relationship with their customers. For many customers, it is one of the very few touchpoints they have with their LDC. Because of its nature, the bill is usually viewed by customers as a wholly negative communication.

Therefore, when problems do occur, and the LDC must initiate contact with their customer, it would be beneficial to the process if customers were contacted via channels they most prefer.

UtilityPULSE database information tells us that the preferred channel for communications can change based on the type of issue which exists, e.g., a billing issue versus an unplanned outage issue. Two things we believe LDCs must be mindful of:

1. The preferred communication channel is determined by the customer, not by the LDC.
2. There is a higher expectation that the LDC will become more “outbound” communications driven.

Ontario LDCs’ customers’ preferred or primary method for their respective LDC to contact them about billing issues are as follows:

Preferred method of communication to receive notice of a Billing Issue (Other than payments owed)

	Ontario LDCs
Telephone	45%
Voice Mail	1%
Text	10%
Email	41%
Don’t know	1%

Base: An aggregate of respondents from 2021 participating LDCs

Effective communication is essential to provide good customer service, improve efficiency and reduce costs. LDCs must maximize the effectiveness of their communications and improve customer interactions consistently across some media channels and customer touch points.

LDCs, for the most part, are primarily set up as “inbound” problem solvers and communicators. The notion or idea that the LDC needs to become more “outbound” with personalized channel communication is a challenge from an organizational culture and operations perspective. Yet, if the LDC doesn’t become more outbound driven, it will have to invest more into inbound methods for solving problems – which is extremely expensive.

Our data show “older” respondents have a heavier desire to communicate via the telephone, but youths, especially those in the 18-34 range, are far more comfortable getting and receiving information electronically. Preferences are changing. The UtilityPULSE database shows about 1 in 3 respondents in the 55+ age category prefers to receive notice about a billing issue via electronic means. In comparison, almost 2 in 3 respondents in the 18-34 age range prefer the electronic channels of email and text.

Communication during an <u>Unexpected Outage</u>

In times of emergency, be they extreme weather events or major equipment failures that cause blackouts and unplanned outages, customer communication can help customers understand what to expect next and when disrupted electricity service might be restored. Early and effective communication helps increase confidence in and credibility of the electricity service provider.

Respondents were asked the preferred communication channel their LDC should use ***during an <u>unexpected</u> outage.***

Preferred communication channel LDC should use during an UNEXPECTED Outage	
	Ontario LDCs
A toll-free outage line	12%
Email alert	38%
Outage map on utility's website	18%
Social media alert on Twitter or Facebook, etc.	14%
Text message alert	49%
Mobile APP alert	15%
Outage map posted on mobile APP	2%
Smart assistant alert such as Alexa or Google	1%
Recorded telephone message alert	29%

Base: An aggregate of respondents from 2021 participating LDCs

Communication during a Planned Outage

Respondents were asked the preferred communication channel Utilities Kingston should use ***during a planned outage;*** times when the utility needs to undertake works on their network (poles, wires, meters, transformers, substations, etc.) to maintain a safe and reliable supply.

Preferred communication channel LDC should use during a PLANNED Outage

	Ontario LDCs
Recorded telephone message	25%
A toll-free outage line	12%
Email alert	47%
Email invite that syncs to your calendar with the outage duration	0%
Outage map on the utility's website	15%
Social media alert on Twitter, Facebook, etc.	12%
Text message alert	39%
Mobile APP alert	13%
Outage map on mobile APP	11%
Hand delivered notice	20%
Other	1%

Base: An aggregate of respondents from 2021 participating LDCs

While there are many ways to communicate, information and messaging is most effective when delivered through channels preferred by customers and the LDC's messaging should be simple, clear, fact-based, and consistent.

LDCs must understand how customers communicate with them, and how they would like their LDC to communicate with them in the future. Knowing this will allow LDCs to: allocate resources where they are most needed; tailor services to meet customers' needs; and, identify where improvements can be made.

However, while most customers appear to have capacity and willingness to use digital channels, there are also customers who do not access digital platforms for a variety of reasons, such as a lack of ability or resources, or due to a preference for other channels. LDCs will need to consider how these customers can be supported and encouraged to use digital services in the future.

Customer Experience Performance rating (CEPr)

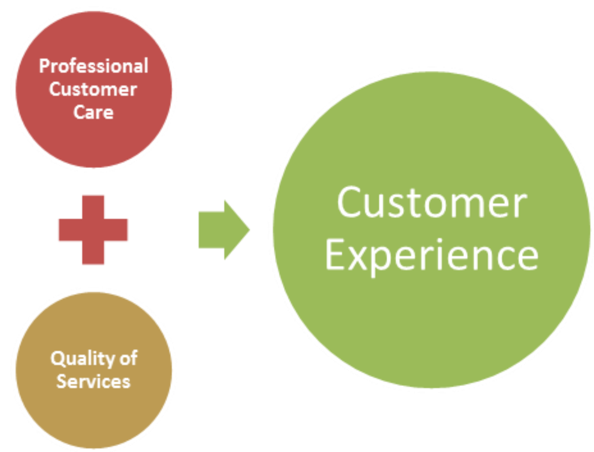
The CEPr score is an effectiveness rating and is affected by many dimensions of service. Every touchpoint with customers on the phone, website, or in-person influences what customers think and feel about the organization. While an excellent transaction today creates a positive experience, the perception created is future transactions will be excellent too. Of course, a negative transaction creates the perception that future transactions will be negative.

When the customer experience is strong, the opportunity to build loyalty is great. When the experience is a negative one, customers often conclude the organization doesn't care. When a customer believes the organization doesn't care, outrage and anger are a very real possibility.

Understanding your customer's expectations for service is the first step in providing an amazing customer experience. It is essential customer care call centres develop a comprehensive understanding of what

At the heart of the CEPr are 4 central questions:

1. *Are interactions with the organization professional and productive?*
2. *Is the organization 'easy to deal with'?*
3. *Does the organization effectively meet your needs?*
4. *Does the organization provide high quality services?*



customers expect from them, whether their needs are being met and how they can improve their service to meet their expectations.

Some of the factors which contribute to the overall customer experience:

- Delivering accessible and consistent customer service (multi-channel)
- Understanding customer expectations
- Maintaining timely resolution timelines
- Providing effective communication(s) according to customer needs
- Demonstrating responsiveness
- Speeding up problem resolution
- Conducting problem analysis to prevent recurring issues
- Easy to do business with
- Seeking customer feedback and following through on recommendations

Customer Experience Performance rating (CEPr)			
	Utilities Kingston	**National**	**Ontario**
CEPr: all respondents	90%	84%	85%

Base: total respondents

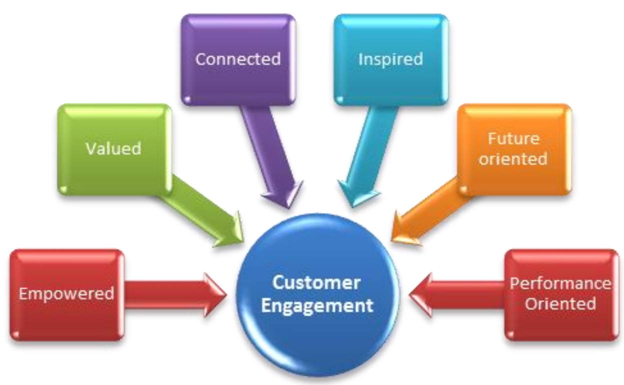
The CEPr for Utilities Kingston is 90%. This rating would suggest that a very large majority of customers have a belief they will have a good to excellent experience dealing with Utilities Kingston professionals.

Customer Centric Engagement Index (CCEI)

Customer engagement and customer satisfaction are very different measures. We believe generating high scores in customer engagement is more difficult than customer satisfaction. For example, a customer can be highly satisfied when the LDC reliability delivers electricity, bills the customer properly, and quickly deals with outages. Essentially when the LDC does what it promises to do, then satisfaction follows.

Customer engagement is about connecting with customers to demonstrate that the LDC has heard the customer and understands the customer's needs, wants, desires, and issues. When the LDC does demonstrate listening and understanding, the result is higher levels of emotional connection, i.e., feelings that the people at the LDC care, respect, and value their customers or are prepared to go-out-of-their-way (if necessary) to help.

Customer engagement is often thought of as a series of activities involving the customer, such as conducting a survey, holding town hall type meetings, focus groups, etc. One could call these types of activities as the behaviour side of engagement. However, there is an emotional side to engagement.



UtilityPULSE has identified the six key dimensions of what defines customer engagement. They are: empowered, valued, connected, inspired, future-oriented, and performance-oriented. Customer-centric engagement is a measure of "goodwill" towards the utility. The UP database does show Secure customers believe they are more highly engaged with their LDC than customers who are At Risk.

This survey also provides you with an emotional look at engagement. The UtilityPULSE CCEI is a gauge of the amount of goodwill which has been generated. High numbers in CCEI suggest there is a high level of goodwill amongst your customers – this is important for two reasons. First, when something goes awry for the utility, goodwill helps the utility to be resilient. Second, goodwill encourages active participation in requests to participate in engagement activities or program offerings from the utility.

The CCEI is a metric designed to get a more in-depth look at the attachment a customer has with your LDC and its brand. High levels of customer engagement (emotional) correlate strongly to high levels of Secure and Favourable customer numbers.

Engagement is how customers think, feel, and act towards the organization. As such, ensuring customers respond positively requires they are rationally satisfied with the services provided AND emotionally connected to your LDC and its brand. The more frequently and consistently an organization's products and services can connect with a customer, especially on an emotional level, the stronger and deeper the customer becomes engaged with the organization.

Utility Customer Centric Engagement Index (CCEI)			
	Utilities Kingston	**National**	**Ontario**
CCEI	88%	83%	82%

Base: total respondents

As measured by the CCEI, less engaged customers are more likely to let costs and/or price impact their perceptions of their LDC. Customers who are highly engaged are more inclined to look past costs and money issues and use a rational approach to make values-based decisions. Highly engaged customers have a stronger emotional connection to your utility. It's this emotional connection that drives commitment, loyalty, and advocacy.

Using the measures of Satisfaction and Engagement, the LDC's relationship with its customers would fall into one of four quadrants: Q1- low satisfaction/low engagement; Q2- high satisfaction/low engagement; Q3- low satisfaction/high engagement and Q4- high satisfaction/high engagement. Most LDCs would agree that having customers fall into the Q1 quadrant isn't good and that customers fall into Q4 is ideal.

When LDCs have candid conversations with customers and employees about their joint and different needs & perspectives, the better the LDC can be for creating an excellent place to do business with and to work.

Customer Effort & Experience Score™ (CEES)

Customers want the processes involved in solving problems or arranging service to be both fast and easy. For the most part, they already know they have a problem or need assistance, hence their dislike/displeasure when being transferred between people or departments, receiving a slow response, or receiving uncaring service.

They also dislike “surprises,” which is a potential reason why utilities are expected to be “pro-active communicators.”

The more time and effort a customer exerts to get questions answered or problems solved, the less happy they are, and the more likely they are to view their LDC as incompetent or lacking in customer-focus.

The CEES as a metric is designed to help the organization remain focused on making things easy and fast for customers. The goal is to encourage improvements in all aspects of the customer’s journey from initial contact to completion of the issue. The central idea of CEES is about getting the most from your investments in people and technology.

As Richard Sharpe, the CEO of Sears Canada during its heyday, said, “A little TLC goes a long way.” He meant that when everyone attempts to Think Like a Customer (TLC), good things happen.

What is the difference between CEES and First Call Resolution, i.e., Problem Solved?

First-call or First-contact resolution (FCR) is a focus and metric for LDCs. What the FCR doesn’t measure is the repeat or follow-up calls regarding the resolution to the problem. For example, a customer may have requested a particular service, and the CSR arranged it – the first time – within a timeline agreed upon by the customer. However, the customer may have additional follow-up questions regarding the requested service and will, therefore, contact the utility again.

The CEES metric helps the organization focus on making things easy and fast for customers by taking into account typical follow-up issues/calls that customers make. LDCs could make better use of processes such as auto dialing reminders of dates/times, emailing information about being prepared, what to do while the electricity is off when the crew is working, etc.

With every passing year, the shift away from phone service to self-service continues. Throwing forms and information on the website **isn’t** “self-service.” We believe LDCs should rebuild their organization around self-service and do so by making it “easy” and “fast” for customers to get information and solve problems.

The CEES is complimentary to the Net Supporter Score. In other words, improvements in CEES scores translate to improvements in Net Supporter Scores. Utilities Kingston has rated a Customer Effort & Experience Score (CEES)™ of 45%, and the Ontario benchmark is 25%, and the UtilityPULSE database average is 34%.

Customer Effort & Experience Score (CEES)

	Opportunity Range <15%	Good Range 15-35%	Very Good Range 35+%
Utilities Kingston	--	--	45%
Ontario Benchmark	--	25%	--

Base: total respondents; range bands represent 2021 data and can change year-to-year

The Customer Effort & Experience Score™ is about encouraging your people to figure out how to speed up and simplify interactions. It is designed to encourage dialogue with all areas of the business to reduce customer effort. Busy, time-pressed customers consider CEES a bona-fide reflection of the business. Most importantly, it has a direct correlation to customer satisfaction, loyalty, and NSS.

UtilityPULSE Report Card®

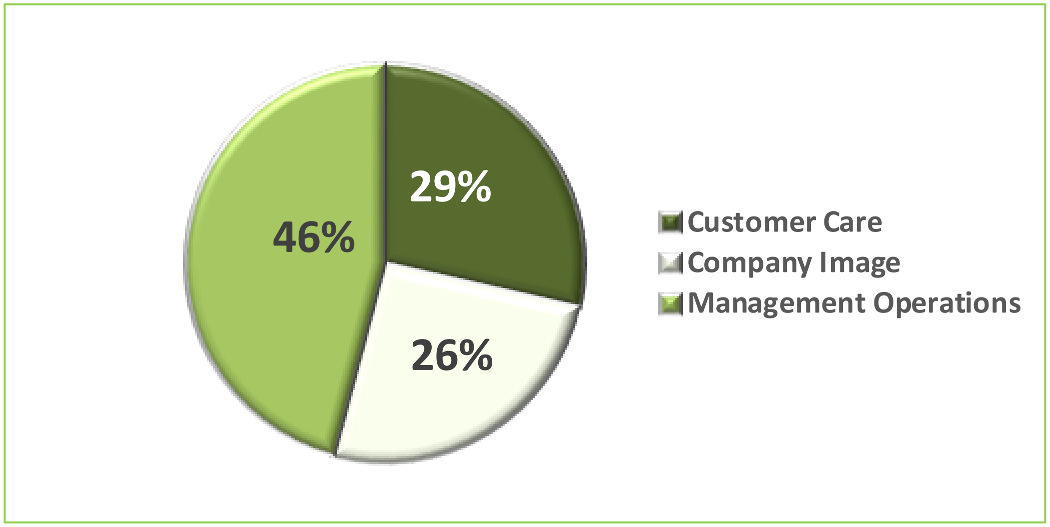
Simul's UtilityPULSE Report Card® is based on tens of thousands of customer interviews gathered over eighteen years. The purpose of the UtilityPULSE Report Card® is to provide electric utilities with a snapshot of performance – on the things customers deem to be important. Research has identified over 20 attributes, sorted into six topic categories (we call these drivers), which customers have used to describe their utility when they have been satisfied or very satisfied with their utility. These attributes form the nucleus, or base, from which "scores" are assigned. Customer satisfaction and loyalty also play a major role in the calculations.

There are two main dimensions of the UtilityPULSE Report Card®. The first is the customer psyche, and the other is customer perceptions about how the utility executes its business.

The Psyche of Customers

Every utility has virtually the same responsibility – provide safe and reliable electricity – yet not all customers are the same. The following chart shows the weight or significance of each category to the customer when forming their overall impression of the utility. Three major themes, each with two major categories, make up the UtilityPULSE Report Card®. In effect, the Report Card provides feedback about how customers perceive the importance of each category.

UtilityPULSE Report Card® Weighting



Base: total respondents

The UtilityPULSE Report Card® also provides customer perceptions about how your utility executes or performs its responsibilities. This is different, very different, from what a customer might say about a major concern or worry they have about electricity. Since its inception, our survey has shown that the primary suggestion for improvement is "reduce prices," which is also a major concern that your customers have about municipal taxes, gas for the vehicle, and other utilities.

Readers of this report should note that the categories and drivers are interdependent. This means, for example, failure to provide high levels of power quality and reliability will have a negative impact on customer perceptions as it relates to customer service. Customer care, when it does not meet customer expectations has a negative impact on Company Image, etc.

Defining the categories and major drivers:

Category: Customer Care

Drivers: Price and Value; Customer Service

Just because everyone likes good customer care, that in and by itself is not a reason to provide it – though it may be important to do so. In highly competitive industries, good customer service may be a differentiating factor. The case for electric utilities is simple, high levels of customer care result in less work (hence cost) of responding to customer inquiries and higher levels of acceptance of the utility's actions.

Price and Value:

Customers have to purchase electricity because life and lifestyle depend on it. This driver measures customer perceptions as to whether the total costs of electricity represent good value and whether the utility is seen as working in the best interests of its customers as it relates to keeping costs affordable.

Customer Service:

Customers do have needs, and every now and again will interact with their utility. How the utility handles various customers' requests and concerns are what this driver is all about. Promptly answering inquiries, providing sound information, keeping customers informed, and doing so in a professional manner are the major components of this driver.

Category: Company Image

Drivers: Company Leadership; Corporate Stewardship

Utilities have an image even if they do not undertake any activities to try to build it. A company's image is both a simple and complex concept. It is simple because companies do create images that are easily described and recognized by their target customers. It is complex because it takes many discrete elements to create an image, which includes, but is not limited to: advertising, marketing communications, publicity, service offering, and pricing.

An electric utility trying to manage its image has one more challenge to deal with, and that is the electric industry itself. There are so many players; residential customers (in particular) don't know who does what or who is responsible for what. So, when there are political or regulatory announcements, the local utility is often swept up into the collective reaction of the population.

Company Leadership

This driver is comprised of customer perceptions as it relates to industry leadership, keeping promises, and being a respected company in the community.

Corporate Stewardship

Customers rely on electricity and want to know their utility is both a trusted and credible organization that is well managed, accountable, socially responsible, and has its financial house in order.

Category: Management Operations

Drivers: Operational Effectiveness; Power Quality and Reliability

Electrical power is the primary product utilities provide their customers. Customers have very high expectations that the power will be there when they need it. Customers have little tolerance for outages. The reality is, every utility must get this part right…no excuses. It is the utility's core business. This category and its drivers are the most important for fulfilling the rational needs of a utility's customers.

Operational Effectiveness

This driver measures customers' perceptions as they relate to ensuring their utility runs smoothly. Attributes such as accurate billing and meter reading, completing service work in a professional and timely manner, and maintaining equipment in good repair are deemed important to customers.

Power Quality and Reliability

Power outages are a fact of life – and customers know it. They expect their utility to provide consistent, reliable electricity, handle outages, restore power quickly, and make using electricity safely an important priority.

Utilities Kingston's UtilityPULSE Report Card®

Performance

	CATEGORY	Utilities Kingston	National	Ontario
1	**Customer Care**	**A**	**B+**	**B+**
	Price and Value	A	B+	B+
	Customer Service	A	B+	A
2	**Company Image**	**A**	**A**	**A**
	Company Leadership	A	A	A
	Corporate Stewardship	A	A	A
3	**Management Operations**	**A+**	**A**	**A**
	Operational Effectiveness	A+	A	A
	Power Quality and Reliability	A+	A	A
	OVERALL	**A**	**A**	**A**

Base: total respondents

As the UtilityPULSE Report Card® shows, the total customer experience with an electric utility is defined as more than “keeping the lights on.” Customers deal with your utility every day for a variety of reasons, most likely because they need someone to help them solve a problem, answer a question, or take their order for service. All your employees, from customer service representatives to linemen, leave a lasting impression on the customers they interact with. In effect, there are many moments of truth. Moments of truth are every customer touchpoint a utility has with its customers. Therefore, managing these moments of truth creates higher levels of Secure customers while reducing the number of At Risk customers that exist.

It's the small things done consistently that matter: Things like greeting every customer, whether on the phone or in person, in a friendly and helpful manner. Things like listening to the customer's needs, providing solutions to their problems, and showing appreciation for their business.

Utilities now recognize customer communications as a valuable aspect of their business. The better a utility communicates with customers in a manner that speaks to them; the more satisfied they are with their overall service. “Sending out information” is not the same as having a “conversation” with a customer. We believe it is increasingly important to channel your communications to the various customer segments which exist.

Employees – in every area – play a critical role in customer service success. Consequently, how they feel about their job responsibilities and role in the company will be communicated indirectly through the level of service they provide customers with. The reality is engaged employees are the key to excellent customer care.

Our survey work with employees shows there are many elements of organizational culture to support the people model needed to achieve high levels of engagement.

Our research has identified 6 main drivers which promote and support people giving their best:

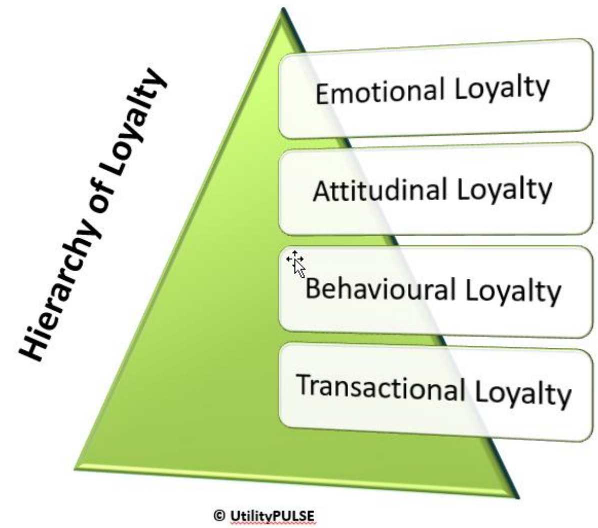
People Model

- **Empowered**
- **Valued**
- **Connected**
- **Inspired**
- **Growing**
- **Performance oriented**

There are 12 key processes from “attracting employees” to “saying goodbye to employees” are part of your people model to get the best performance from every employee.

We believe taking the time to understand the difference between employee satisfaction and organizational culture is worthwhile from a resourcing perspective and a people development perspective. Every organization has a culture – we believe it is a leadership imperative to install and maintain a culture which ensures you attain the achievements and successes of your utility’s many investments in people, technology, and equipment. It is true, organization culture affects everyone, and everyone affects organization culture.

The Loyalty Factor

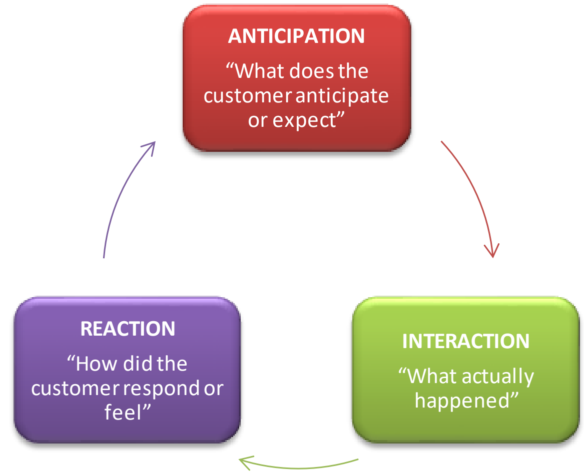


If a customer is satisfied, it doesn't necessarily mean they are loyal. Satisfaction is about fulfilling promises/expectations; loyalty goes way beyond that by creating exceptional experiences and long-lasting relationships. There is a reason why marketing campaigns strive to build brand loyalty, not brand satisfaction. Measuring customer loyalty in an industry where many customers don't have a choice of providers doesn't make sense. Or does it?

The answer depends on how you define "customer loyalty."

Private industry often equates customer loyalty with basic customer retention. If a customer continues to do business with a company, the customer is, by definition, considered to be loyal. If this definition were applied to many companies in the utility industry, all customers would automatically be considered loyal. As such, measuring customer loyalty would appear to be unnecessary.
Natural monopolies (like LDCs) are not really different in what they should measure except that trying to determine which customers are "loyal" or "at-risk" is not about their future behaviour but more about their "attitudinal" loyalty (are they advocates?).

Customer Service, when done well, promotes satisfaction which builds the foundation towards loyalty. Whether a customer is loyal and/or satisfied will be determined by three realities: ANTICIPATION – what your customer anticipates or expects; INTERACTION – what actually happened with/to the customer; and REACTION – how did the customer respond and how did it ultimately make the customer feel.



Perhaps a better or more relevant way for utilities to approach the definition of customer loyalty is to expand further how they think about loyalty. Consider the following definition: Customer loyalty is an emotional disposition on the part of the customer, which affects the way(s) in which the customer (consistently) interacts, responds, or reacts towards the company – its products & services, and its brand.

Some Tips to build loyalty:

- ✓ **Solve problems quickly**
- ✓ **Treat customers right**
- ✓ **Listen to complaints**
- ✓ **Be personal; create a great experience**
- ✓ **Friendly customer service**
- ✓ **Accessible information or help**
- ✓ **Good reputation**
- ✓ **Demonstrate you care**

So, what does it mean to respond favourably to a company? At a basic level, this can mean choosing to remain a customer. As previously mentioned, however, this is essentially a non-issue for many utility companies. It then becomes necessary to think beyond just customer retention. One needs to consider other ways in which customers can respond favourably toward a company.

Other favourable responses or behaviours can be classified into one of three categories that reflect the concept of customer loyalty:

- Participation
- Compliance or Influence
- Advocacy

Specific examples of potential participatory behaviour in the electric utility industry include:

- Signing up for programs which help the customer reduce or manage their energy consumption
- Using the utility as a consultant when selecting energy products and services from a third party
- Participating in pilot programs or research studies.

Specific examples of potential compliance or influence behaviours utility customers might exhibit include:

- Seeking the utility's advice or expertise on an energy-related issue
- Voluntarily cutting back on electricity usage if the utility advised the customer to do so
- Accepting the utility's energy advice or referrals to energy contractors or equipment
- Being influenced by the utility's opinion regarding energy- management advice, equipment, or technologies
- Providing personal information which enables the utility to serve the customer better
- Paying bills online.

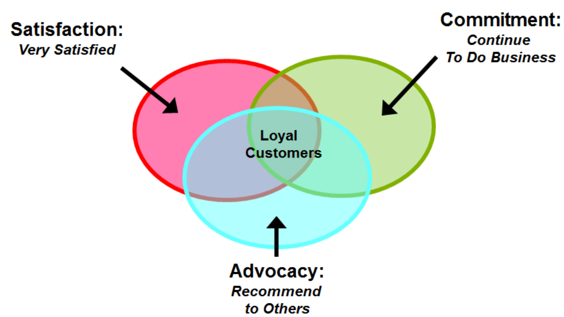
Creating customer advocates can be especially important for a company in a regulated industry. In the absence of customer advocates, or worse, in a situation where customers speak unfavourably about a company or actively work to support issues that are counter to those the company supports, companies can suffer a variety of negative consequences like increased business costs, lawsuits, fines, and construction delays. For an electric utility, specific examples of potential advocacy behaviour include:

- Supporting the utility's positions or actions on energy-related public issues, including the environment
- Supporting the utility's position on the location and construction of facilities
- Providing testimonials about positive experiences with the utility.

In sum, loyal behaviour in the utility industry may not be as evident as it is in a more competitive environment. Measuring customer loyalty in a generally non-competitive industry requires one to think about loyalty in non-traditional ways. Customer loyalty is an intangible asset with positive consequences or outcomes associated with it no matter what the industry. Properly measuring loyalty among utility customers requires thoughtful probing to thoroughly identify the range of participation, compliance, and advocacy behaviours that will ultimately benefit the company in meaningful ways and foster happier and more loyal customers.

Loyalty is driven primarily by a company's interaction with its customers and how well it delivers on their wants and needs.

Customer Loyalty Model



Loyalty is based on likelihood to:

- ***Satisfaction: overall satisfaction***
- ***Commitment: continue as a customer***
- ***Advocacy: willingness to recommend***

The UtilityPULSE Customer Loyalty Performance Score segments customers into four groups: **Secure** – the most loyal - **Still Favorable**, **Indifferent**, and **At risk**.

Secure customers are "very satisfied" overall with their local electric utility. They have a very high emotional connection with their utility and "definitely" would recommend their local utility.

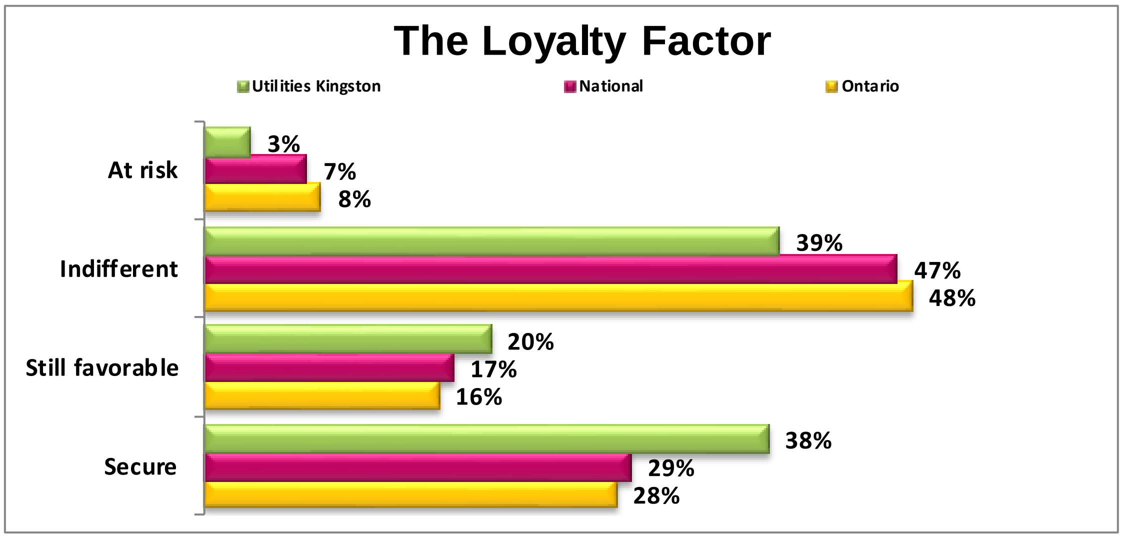
Still favorable customers are "very satisfied" overall, "definitely" or "probably" would recommend their local utility and not switch if they could.

Indifferent customers are less satisfied overall than secure and still-favorable customers and less inclined to recommend their local utility or say they would not switch.

At risk customers, who are "very dissatisfied" with their electric utility, "definitely" would switch and "definitely" would not recommend it.

Customer Loyalty Groups				
	Secure	Favorable	Indifferent	At Risk
Utilities Kingston				
2021	38%	20%	39%	3%
2020	-	-	-	-
2019	36%	21%	41%	4%
2018	-	-	-	-
2017	33%	19%	42%	6%

Base: total respondents / (-) not a participant of the survey year



Base: total respondents

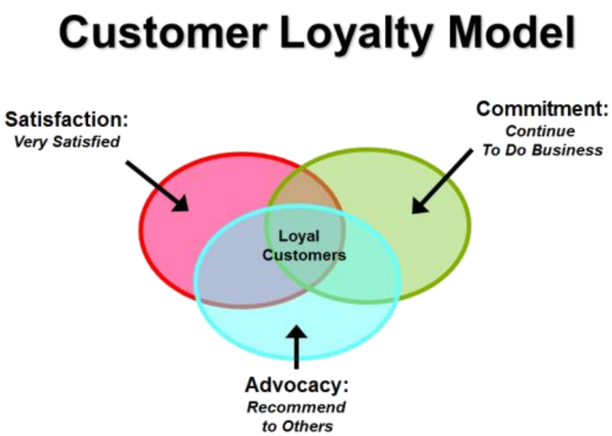
Customer Loyalty Groups				
	Secure	**Favorable**	**Indifferent**	**At Risk**
Ontario				
2021	28%	16%	48%	8%
2020	29%	20%	46%	6%
2019	27%	16%	48%	9%
2018	20%	16%	50%	13%
2017	19%	13%	52%	17%
National				
2021	29%	17%	47%	7%
2020	30%	18%	48%	5%
2019	27%	17%	49%	7%
2018	24%	15%	51%	10%
2017	21%	16%	50%	13%

Base: total respondents

Customer commitment

Customer loyalty is a term used to embrace a range of customer attitudes and behaviours. One of the metrics used to gauge loyalty is the measure of **retention,** or intention to buy again; this loyalty attitude is termed **commitment.** For LDCs, commitment is not about behaviour; it is about attitude, i.e., do they want to remain your customer.

Customer commitment is a very important driver of customer loyalty in the electricity service industry. In a similar way to trust, commitment is considered an important ingredient in successful relationships. In simpler terms, commitment refers to the motivation to continue to do business with and maintain a relationship with a business partner, i.e., the local utility.



For electric utilities, this measurement is about identifying the number of customers who feel they “want to” vs. “have to” do business with you. Potential benefits of commitment may include word of mouth communications - an important aspect of attitudinal loyalty. Committed customers have been known to demonstrate several beneficial behaviours; for example, committed customers tend to:

- Come to you. One of the key benefits of establishing a good level of customer loyalty is customers will come to you when they need a product or service

- Validate information received from 3rd parties with information and expertise that you have
- Try new products/initiatives
- Perhaps they will even trust you when recommendations are made
- Be more price tolerant
- More receptivity of utility viewpoints on various issues
- More tolerance of errors or issues which inevitably take a swipe at the utility
- Stronger levels of perception regarding how the utility is managed.

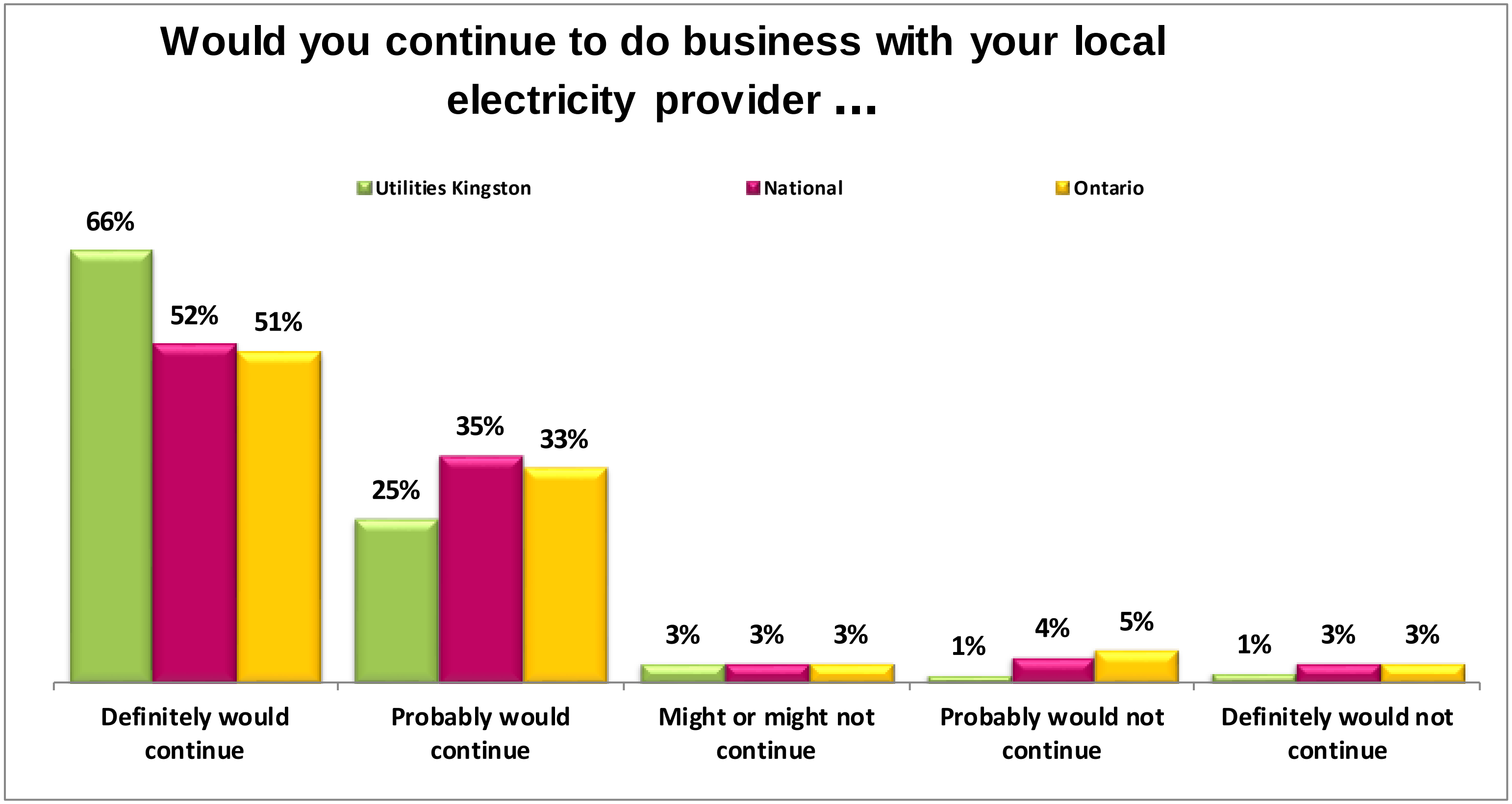
Though customers cannot physically leave you, they can emotionally leave you, and when they do, it becomes an extreme challenge to garner their participation or support for utility initiatives.

Electricity customers' loyalty – … Is a company that you would like to continue to do business with			
	Utilities Kingston	**National**	**Ontario**
Top 2 boxes: 'Agree Strongly + Somewhat' would recommend	92%	87%	85%
Agree strongly	66%	52%	51%
Agree somewhat	25%	35%	33%
Neither agree or disagree	3%	3%	3%
Disagree somewhat	1%	4%	5%
Disagree strongly	1%	3%	3%

Base: total respondents

Electricity customers' loyalty – … Is a company that you would like to continue to do business with					
Utilities Kingston	**2021**	**2020**	**2019**	**2018**	**2017**
Top 2 boxes: 'Definitely + Probably' would continue	92%	-	90%	-	88%

Base: total respondents / (-) not a participant of the survey year

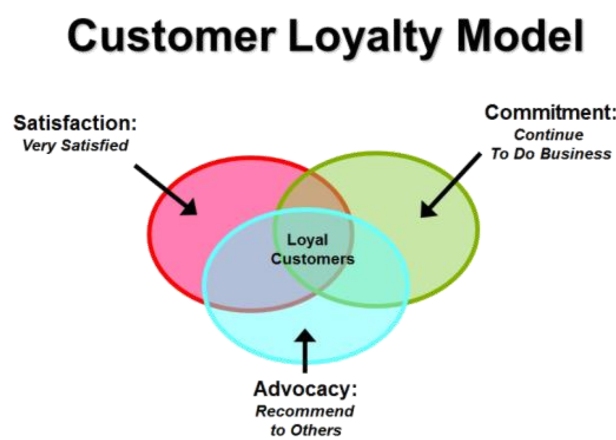


Base: total respondents

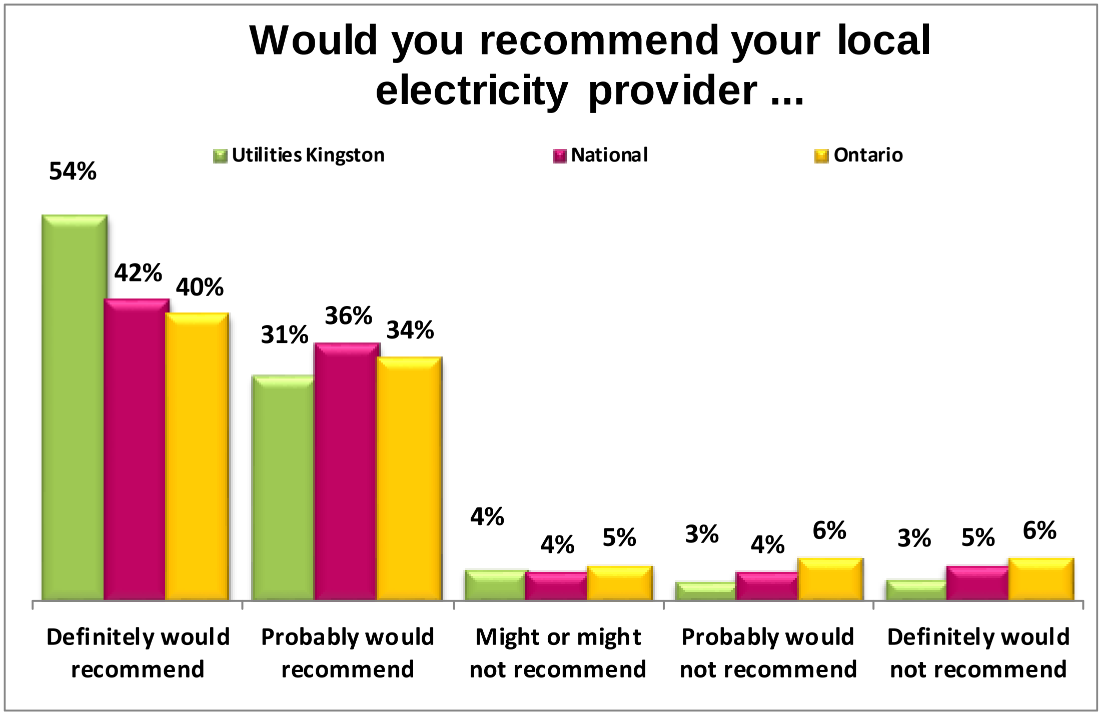
Word of mouth

Advocacy is one of the metrics measured in determining customer loyalty. Essentially, companies believe a loyal customer is one who is spreading the value of the business to others, leading new people to the business, and helping the company grow. Customer referrals, endorsements, and spreading the word are extremely important forms of customer behaviour. For LDCs, this is about generating positive referents about the LDC as a relevant and valuable enterprise.

When customers are loyal to a company, product, or service, they are not only more likely to purchase from the company again, but they are more likely to recommend it to others – to openly share their positive feelings and experiences with others. In today's world, thanks to the Internet, they can tell and influence millions of people. The same holds true, if not more so, when customers are disloyal. Disgruntled customers could share their negative experiences with an ever-widening audience, jeopardizing a company's reputation and resulting in fewer engaged customers and/or customers who are Favourable or Secure. Secure customers typically are advocates, and they are deeply connected and brand-involved.



Would you tell me if you agree or disagree with the following statement? Utilities Kingston is a company that you would recommend to a friend or colleague …



Base: total respondents

Word of mouth communication is a potent form of communication and influence. When customers speak to other customers (or their peers), it is more credible; it goes through fewer perceptual filters and can enhance the view of services or products better than marketing communication.

*There are two forms of word of mouth which utilities need to understand. The first is **Experience-based word of mouth** which is the most common and most powerful form. It results from a customer's direct experience with the utility or the re-statement of a direct experience from a trusted source.*

*The second is **Relay-based word of mouth**. This is when customers pass along important messages to others based on what they have learned through the more traditional forms of communications. For example, if the utility was communicating an offer for "free LED lights" chances are high the offer will be "relayed" to others through word of mouth.*

For an electric utility, specific examples of potential positive advocacy behaviour include:

- *Recommending other customers specifically locate in the geographic area which is serviced by that utility*
- *Supporting the utility's positions or actions on energy-related public issues, including the environment*
- *Supporting the utility's position on the location and construction of facilities*
- *Providing testimonials about positive experiences with the utility*

Electricity customers' loyalty – … is a company that you would recommend to a friend or colleague			
	Utilities Kingston	**National**	**Ontario**
Top 2 boxes: 'Agree Strongly + Somewhat' would recommend	85%	78%	74%
Agree strongly	54%	42%	40%
Agree somewhat	31%	36%	34%
Neither agree or disagree	4%	4%	5%
Disagree somewhat	3%	4%	6%
Disagree strongly	3%	5%	6%

Base: total respondents

Electricity customers' loyalty – is a company that you would recommend to a friend or colleague					
Utilities Kingston	**2021**	**2020**	**2019**	**2018**	**2017**
Top 2 boxes: 'Definitely + Probably' would recommend	85%	-	87%	-	82%

Base: total respondents / (-) not a participant of the survey year

Our survey research, as well as theory, backs up the fact that if your customers are willing to endorse you and put their reputation on the line to recommend you, they also trust you and are satisfied with the service you are providing.

Net Supporter Score (NSS) vs. Net Promoter Score (NPS)

Supporter

The Net Supporter Score™ (NSS) is a metric which measures how likely customers could ***support*** policy changes, actions, programs, or service changes or enhancements the LDC wishes to make. The NSS is a metric developed to help the organization and its people continue on a path of improving customer experiences, whether those experiences are in-person, over the telephone, or online. In a nutshell, the NSS reflects the net number of customers who have confidence in the LDC to continue to serve in their best interests.

In a world where technology, societal, legislative, and regulatory changes can happen quickly, utilities need to adapt and respond professionally without causing customer disruption. Supporters may not "like" a change, but they are more likely to "support" the change because they believe the utility is operating in the best interests of all parties.

Net Supporter Score™ (NSS)			
	Opportunity Range <20%	Good Range 20-40%	Very Good Range 40+%
Utilities Kingston	--	35%	--
Ontario Benchmark	--	20%	--

Base: total respondents; range bands represent 2021 data and can change year-to-year

Utilities Kingston has a Net Supporter Score™ (NSS) of 35%. The Ontario benchmark is 20% and the UtilityPULSE database average is 26%.

The Net Promoter Score™ (NPS) is a well-known measurement that is respected for its simplicity and tendency to help an organization and its people focus on customer experiences. For utilities, customers with a high net promoter score may be good candidates for increased outreach and offer demand response and other utility programs. In a sense, it is a complementary measure to the well-established loyalty measure we call "Secure" customers.

Promoter

Nonetheless, the NPS is an easy calculation and is based on the score of one question. That question is about the subject of "recommend to others." The NPS was designed to help companies sell more products and services. For utilities, the NPS is best suited as an affinity gauge. Like other measures, Satisfaction, Loyalty, CEES, CEPr, NSS, and others, NPS is another measure that can promote internal dialogue about how processes, policies, and service can evolve so that more customers would "recommend" the utility.

The NPS metric was developed by and is a registered trademark of Fred Reichheld, Bain & Company, and Satmetrix in 2003.

Utilities Kingston has a Net Promoter Score™ (NSS) of 44%**.** The Ontario benchmark is 24%, and the UtilityPULSE database average is 35%.

Net Promoter Score™ (NPS)

	Opportunity Range <5%	Good Range 5-25%	Very Good Range 25+%
Utilities Kingston	--	--	44%
Ontario Benchmark	--	24%	--

Base: total respondents; range bands represent 2021 data and can change year-to-year

Corporate image

Although reputation is an intangible concept, a strong corporate image makes it easier to capture the attention of more customers – more often. Also, to be seen as an independent organization, thereby making it easier to introduce new ideas. Employees appreciate a strong corporate image.

Attributes measured in the annual UtilityPULSE survey which are strongly linked to a utility's image include:

Attributes linked to Company Image and Reputation

	Utilities Kingston	National	Ontario
Keeps its promises to its customers and community	87%	83%	83%
Adapts well to changes in customer expectations	82%	78%	76%
Pro-active in communicating changes and issues which may affect service	83%	79%	79%
Customer-focused and treats customers as if they're valued	86%	79%	79%
Spends money prudently to keep the electricity system reliable	84%	77%	76%
Is a socially responsible company	85%	83%	82%
Company to recommend	87%	83%	82%
Delivers on its service commitments	91%	86%	86%
Is 'easy to do business with'	89%	84%	84%
Operates a cost-effective electricity system	79%	75%	70%
Is a trusted and trustworthy company	90%	84%	84%

Base: total respondents with an opinion

Corporate Credibility & Trust

Credibility is a judgment customers and others make about whether a person or an organization has the competencies and experience to do what they promise to do. Trust is a feeling or belief that a person or an organization they are dealing with is doing so in an honest, open manner with no hidden agendas. How customers and other stakeholders respond to your communications is affected by the person's perception. Without credibility and trust, everything you say to customers, employees, and others can be questioned.

Of paramount importance to maintaining credibility & trust is effectively managing expectations—customers, employees, and other stakeholders that matter to the business of the LDC. A key to this is open and honest communications. An important benefit of having a high degree of credibility & trust is, authentic collaboration can become a reality. Credibility & trust is a powerful currency for building relationships. Credibility & trust are outcomes based on what the LDC does, not what it might be doing.

Attributes strongly linked to Credibility & Trust			
	Utilities Kingston	**National**	**Ontario**
Efficiently manages the electricity system	89%	83%	82%
Keeps its promises to customers and the community	87%	83%	83%
Customer-focused and treats customers as if they're valued	86%	79%	79%
Is a trusted and trustworthy company	90%	84%	84%

Base: total respondents with an opinion

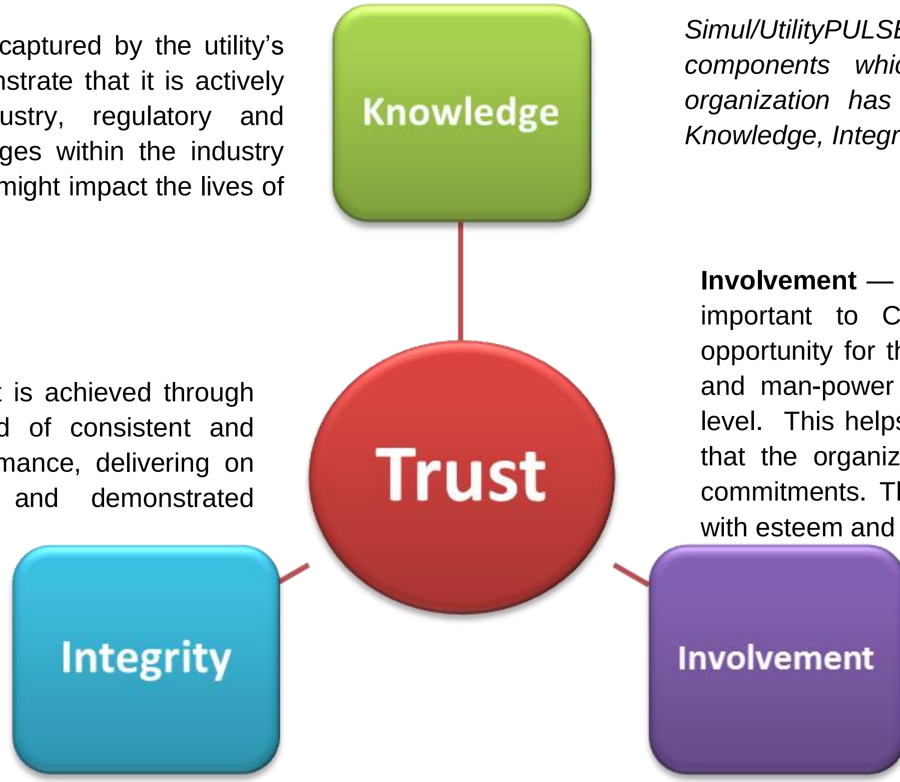
Simul/UtilityPULSE research shows the under-pinning components which lead customers to believe an organization has credibility and can be trusted are: Knowledge, Integrity, Involvement and Trust.

Knowledge is captured by the utility's ability to demonstrate that it is actively aware of industry, regulatory and economic changes within the industry and how these might impact the lives of customers.

Trust — Trust is achieved through a track record of consistent and reliable performance, delivering on commitments and demonstrated accountability.

Involvement — Corporate Involvement is increasingly important to Canadian communities as it is an opportunity for their local utility to use their resources and man-power to benefit people at the community level. This helps to build credibility as customers see that the organization is acting and delivering on its commitments. This helps customers regard the utility with esteem and respect.

Integrity is established by demonstrating adherence to a code of conduct. It requires consistently acting in accordance with the values and goals that have been communicated to customers.



Credibility and Trust Index

Utilities Kingston 88%

Ontario 84%

National 84%

Priority Planning

Customers are impatient, employees are impatient, company leadership is impatient, we want everything ‘right now’ and at ‘no cost.’ Priority planning is about having a (reasonably) clear focus on what is important to customers or other stakeholders, and to help people from feeling overwhelmed. By engaging stakeholders and obtaining their input in undertaking a priority planning process helps to build "prepared minds"—that is, to make sure that the LDC decision-makers have a solid understanding of customer priorities, and what things the business might need to change or make investments in.

Respondents were asked to comment on the priority level of the implementation or execution of different initiatives/projects which encompass operational aspects and/or financial commitment.

A well-communicated sense of organizational priorities helps to align most of the projects and programs in an organization to its strategies. Prioritizing increases the success rates of infrastructure projects or other capital initiatives, increases the alignment and focus of senior management teams around strategic goals, allows operational teams to make better decisions, and, most important, has everyone aiming to complete set targets.

Looking at a time horizon spanning five years, customers were asked to weigh in on the priority of Utilities Kingston undertaking various projects or initiatives.

Priority Planning within the next 5 years		
Top 2 Boxes: 'very high + high priority'	**Utilities Kingston**	**Ontario LDCs**
Maintaining and upgrading equipment to ensure a safe and reliable electricity supply	90%	92%
Investing to ensure that more frequent and severe weather events will cause less damage to distribution system	85%	86%
Investing in projects to reduce the environmental impact of Utilities Kingston's operations	82%	75%
Preventing data breaches and system disruptions due to cyberattack	82%	84%
Investing more in the electricity grid to reduce outages	80%	83%
Reducing response times to outages	80%	84%
Investing more in vegetation management (clearing trees and brush around powerlines for increased safety and reliability)	68%	75%
Increasing the use of e-billing and paper-free communication options to reduce environmental impact and improve cost-effectiveness	67%	65%
Educating the public as it relates to electricity safety	65%	69%
Burying overhead wires	58%	62%
Developing a SMART phone application to allow you to view your electricity use and pay your bill	51%	52%
Providing sponsorships to local community causes	48%	52%
Providing more self-serve services on the website	44%	45%
Increasing the use of social media (such as Twitter, Facebook, and others)	24%	27%

Base: total respondents / An aggregate of respondents from 2021 participating LDCs

Respondents for Utilities Kingston identified the following projects/initiatives as top items which Utilities Kingston should focus attention and resources:

1.	**Maintaining and upgrading equipment to ensure a safe and reliable electricity supply**	90%
2.	**Investing to ensure that more frequent and severe weather events will cause less damage to distribution system**	85%
3.	**Investing in projects to reduce the environmental impact of Utilities Kingston's operations**	82%
4.	**Preventing data breaches and system disruptions due to cyberattack**	82%
5.	**Investing more in the electricity grid to reduce outages**	80%
6.	**Reducing response times to outages**	80%

How can service to customers be improved?

The electric utility industry is in a state of continuous transformation. External factors - including shifts in governmental policies, a global thrust to conserve energy, advances in new technologies, and power generation are driving massive changes throughout the industry. LDCs of today and the future can also expect a much more intense level of customer involvement. UtilityPULSE research shows customers want to be heard.

Despite all the talk today centered on quality, new processes and systems, continuous improvement, and costs unless all of this is aimed at obtaining customer satisfaction, it will not be worth much over the longer term.

Qualitative questions typically do not provide statistical richness, which is associated with a quantitative question. However, they do provide words, phrases, insights into the thinking patterns and/or feelings of customers. This means qualitative questions have an interpretive richness that assists in deriving meaning from the survey. The broader range of suggestions we are getting when conducting the survey is a sign the customer base is becoming more and more segmented. Not all customers are the same.

The struggle for electric utilities is finding the right balance between cost-effective, technology-enabled approaches to customer services and person-to-person contact.

Customers want their utility to focus on what matters most; offer products and services which “make a difference in their life,” “gives them peace of mind” and “delivered by trusted and credible people.”

We are interested in knowing what you think are the one or two most important things Utilities Kingston could do to improve service to their customers?

One or two most important things 'your local utility' could do to improve service	
	Utilities Kingston
Better prices / lower rates	30%
Be more environmentally friendly	15%
Improve billing / simplify the bill	9%
Create an online/mobile app (i.e. report outages, access bill)	9%
Better website	8%
Better power reliability / less power outages	7%
Better communications / be pro-active	4%
Be more efficient / cost-effective	4%
More information & incentives on energy conservation	4%
Better information on outages when they occur	4%
Restore power faster	3%
Better maintenance	3%
Bury the power lines	3%
Get involved with green energy	3%

Base: total respondents with suggestions

What do customers think about electricity costs?

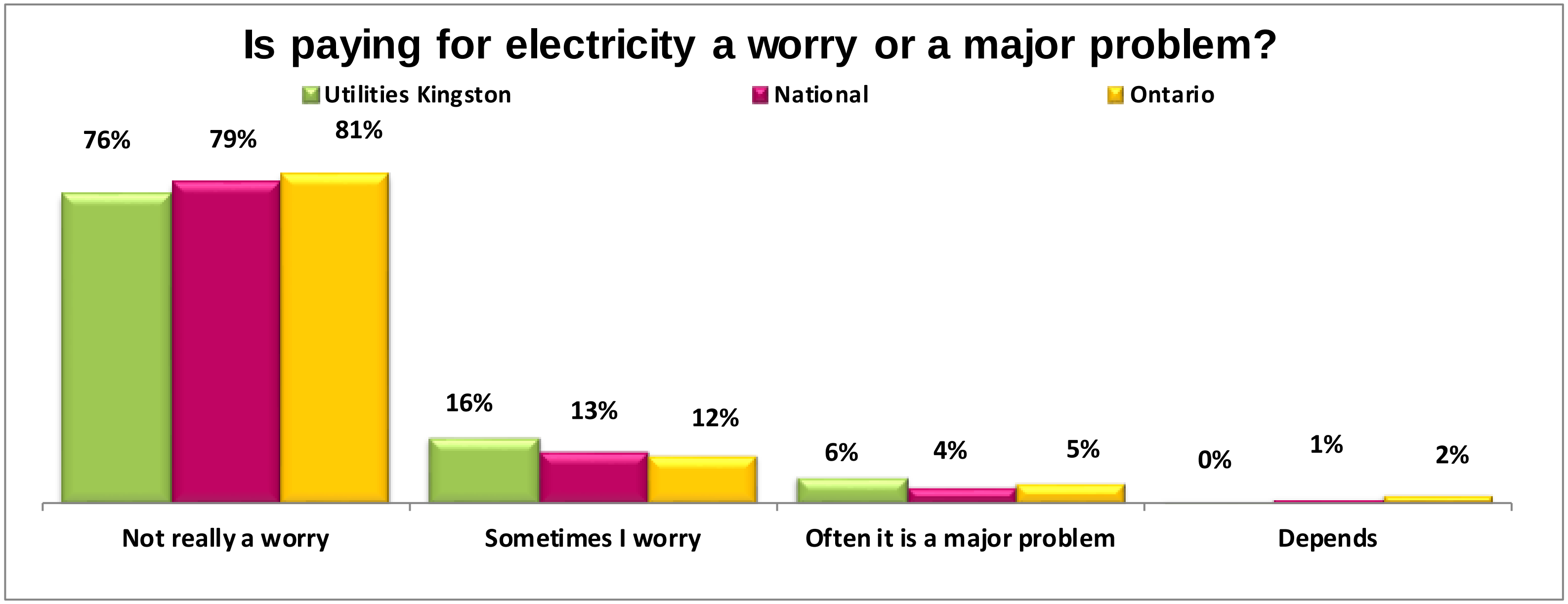
A conversation with almost any LDC customer will migrate into a conversation around cost. The concern around cost has little to do with age or income, or whether the customer uses a little or a lot of electricity – they all have a concern over costs. Unfortunately, very few customers know how much their LDC gets, of the total electricity bill, to manage the electricity network safely. A customer concern over costs is first and foremost a concern over the total bill. It doesn't help that there have been industry issues, or frequent changes to the pricing of the electricity (as a commodity). The ability to pay is highly correlated to satisfaction.

Next, I am going to read several statements people might use about paying for their electricity. Which one comes closest to your own feelings, even if none is exactly right? Paying for electricity is not really a worry. Sometimes I worry about finding the money to pay for electricity, or Paying for electricity is often a major problem?

Is paying for electricity a worry or a major problem?

	Not a worry	Sometimes	Often	Depends
Utilities Kingston	76%	16%	6%	-
National	79%	13%	4%	1%
Ontario	81%	12%	5%	1%

Base: total respondents



Base: total respondents

Is paying for electricity a worry or a major problem?				
	Not a worry	**Sometimes**	**Often**	**Depends**
		Utilities Kingston		
<$30,000	57%	31%	12%	0%
$30<$75,000	73%	20%	6%	0%
$75,000+	87%	7%	4%	0%

Base: total respondents

Is paying for electricity a worry or a major problem?				
	Not a worry	Sometimes	Often	Depends
		Ontario		
2021	81%	12%	5%	1%
2020	78%	16%	3%	0%
2019	72%	19%	7%	1%
2018	68%	21%	8%	1%
2017	61%	26%	10%	1%
		National		
2021	79%	13%	4%	1%
2020	78%	15%	3%	1%
2019	74%	18%	6%	0%
2018	71%	18%	7%	0%
2017	67%	19%	11%	1%

Base: Ontario and National Benchmarks

Impact of COVID

The pandemic is ongoing, and the situation continues to evolve. Businesses and families continue to deal with the impact. Many businesses have seen a substantial reduction in revenues, lay-offs and even closures. Utilities Kingston's customers have reported the following economic impacts:

Economic impact of COVID-19 pandemic	
	Residential
Moved to work from home environment	28%
Reduced hours or shifts per week	13%
Increased hours or shifts	7%
Reduced salary/pay cut	6%
Lay-off	6%
Lost job	5%
Closed business (for self-employed)	3%
Leave of absence	3%
None of the above	50%

Base: total RESIDENTIAL respondents

As reported by residential respondents of Utilities Kingston:

13% experienced reduced hours or shifts at work while **28%** moved to a work from home environment.

Base: total RESIDENTIAL respondents

Economic impact of COVID-19 pandemic	
	Commercial
Experienced a significant decline in revenue	43%
Business continued during the pandemic	38%
Reduced employee hours or shifts	38%
Employees worked from home where practical	32%
Laid off employees	22%
Closed the business	20%
Increased employee hours or shifts	10%
Experienced significant sales increase	7%
None of the above	3%

Base: total COMMERCIAL respondents

decrease in
business volumes

As reported by commercial respondents of Utilities Kingston:

43% experienced a significant decline in revenue while **20%** had to close their business.

Base: total COMMERCIAL respondents

Business owners have employed several strategies to continue operating. Currently, the most difficult aspect to manage is the uncertainty of the current day to day landscape. Whether business owners continue to face challenges or have an opportunity to capitalize and pivot their businesses, there is optimism we are navigating our way back to a “new” normal and the economy will rebound once the pandemic subsides.

What do small commercial customers think?

Based on data in the UtilityPULSE database, small commercial customers have relatively similar views to residential customers about their utility. The tables associated with this report will contain your LDC's specific information as it relates to residential and commercial customers. A word of caution, smaller data samples create greater swings or spreads in the data, hence mitigating the effect of a small data sample by using the UP database. Your specific data can be found in your tables. What follows are the findings from this cohort of LDCs.

Small Commercial Customer (General Service < 50kW Demand)

A small commercial customer is defined by the OEB as a non-residential customer in a less than 50 kW demand rate class. These customers are similar to the residential customer in that their bill does not have a demand component to it and their charges are based upon KWH of consumption. Most of these customers would occupy small storefront locations or offices

An area of concern is the LDC's ability to "target" its communications to the type of business. Beyond having a contact telephone number, company name, and address, there isn't much "knowledge" about the small commercial customer. In a time when "targeted" communication is important, knowing the type of category of small commercial accounts would assist LDCs in delivering meaningful messages in an effective way. This could be particularly important in the area of managing consumption, i.e., day, or time of day when energy use is high. In time, LDCs will have to do a better job of segmenting their communication. After all, a small restaurant is different from a small accounting office.

Satisfaction: Pre & Post		
Satisfaction (Top 2 Boxes: 'very + somewhat satisfied')	**Residential**	**Commercial**
Initially	93%	95%
End of Interview	93%	93%

Base: total respondents from the 2021 UtilityPULSE Database

Killer B's: Outages & Bills problems		
	Residential	**Commercial**
Respondents with outage problems	36%	30%
Respondents with billing problems	7%	10%

Base: total respondents from the 2021 UtilityPULSE Database

Did you try to contact your electric utility about ANY issue over the past 12 months?		
	Residential	**Commercial**
Yes	24%	39%
No	75%	60%

Base: total respondents from the 2021 UtilityPULSE Database

How many times did you contact your utility?		
	Residential	Commercial
1	38%	29%
2	28%	28%
3	14%	13%
More than 3	17%	28%

Base: total respondents from the 2021 UtilityPULSE Database who responded ‘YES’ to contact the utility over past 12 months

Which issue prompted contact with the utility?		
	Residential	Commercial
Outages	51%	39%
Billing	41%	59%
An issue other than Billing or Outages	19%	17%

Base: total respondents from the 2021 UtilityPULSE Database who responded ‘YES’ to contact the utility over past 12 months

How many outages have you had in last 12 months?		
	Residential	Commercial
1	17%	12%
2	22%	27%
3	20%	9%
More than 3	40%	49%

Base: total respondents from the 2021 UtilityPULSE Database who responded ‘OUTAGES’ to issue prompting contact to the utility

Did you visit the utility's website to try to resolve your issue on your own, or to get more clarity before contacting the utility?		
	Residential	**Commercial**
Yes	43%	39%
No	57%	61%

Base: total respondents from the 2021 UtilityPULSE Database who responded 'YES' to contact the utility over past 12 months

Communication methods used to contact local utility		
	Residential	**Commercial**
Telephone	90%	95%
Email	8%	16%
The utility's website	7%	3%
Social media i.e. Twitter, Facebook	2%	0%
Mail	1%	1%
In-person	2%	1%

Base: total respondents

Overall satisfaction with most recent experience		
	Residential	**Commercial**
Top 2 Boxes: 'very + somewhat satisfied'	73%	74%
Bottom 2 Boxes: 'somewhat + very dissatisfied'	25%	24%

Base: total respondents from the 2021 UtilityPULSE Database

As it relates to the six attributes associated with customer service:

Very or fairly satisfied with…	Residential	Commercial
The time it took to contact someone	72%	69%
The time it took someone to deal with your problem	66%	71%
The helpfulness of the staff who dealt with your problem	71%	79%
The knowledge of the staff who dealt with your problem	72%	82%
The level of courtesy of the staff who dealt with your problem	81%	89%
The quality of information provided by the staff member	70%	80%

Base: total respondents from the 2021 UtilityPULSE Database

Comparisons between Residential and Commercial		
Loyalty Groups	Residential	Commercial
Secure	32%	34%
Still Favourable	17%	18%
Indifferent	46%	43%
At risk	6%	5%

Base: total respondents from the 2021 UtilityPULSE Database

Loyalty Model Factors		
	Residential	**Commercial**
Very/somewhat satisfied	93%	95%
Definitely/probably would continue	88%	91%
Definitely/probably would recommend	81%	86%

Base: total respondents from the 2021 UtilityPULSE Database

Is paying for electricity a worry or a major problem?		
	Residential	**Commercial**
Not a worry	32%	34%
Sometimes	17%	18%
Often	46%	43%
Depends	6%	5%

Base: total respondents from the 2021 UtilityPULSE Database

Important attributes which describe operational effectiveness		
	Residential	**Commercial**
Provides consistent, reliable electricity	91%	92%
Delivers on its service commitments to customers	88%	89%
Has accurate billing	88%	88%
Quickly handles outages and restores power	89%	89%
Makes electrical safety a top priority	89%	91%
Efficiently manages the electricity system	85%	86%
Is a company that is ‘easy to do business with’	86%	87%
Operates a cost-effective electricity distribution system	75%	75%
Standard of reliability meets expectations	89%	90%

Base: total respondents from the 2021 UtilityPULSE Database with an opinion

Important attributes which shape perceptions about corporate image		
	Residential	**Commercial**
Keeps its promises to customers and the community	85%	86%
Is a socially responsible company	85%	85%
Is a trusted and trustworthy company	87%	87%
Adapts well to changes in customer expectations	80%	82%

Base: total respondents from the 2021 UtilityPULSE Database with an opinion

Important attributes which shape perceptions about service quality and value		
	Residential	**Commercial**
Is pro-active in communicating changes and issues which may affect your electricity service	81%	82%
Provides good value for money	74%	75%
Customer-focused and treats customers as if they're valued	82%	83%
Deals professionally with customers' problems	87%	88%
Spends money prudently	82%	82%
Provides information and tools to help manage electricity consumption	81%	80%
The cost of electricity is reasonable when compared to other utilities	69%	68%

Base: total respondents from the 2021 UtilityPULSE Database with an opinion

Economic impact of COVID-19 pandemic	
	Residential
Closed business (for self-employed)	4%
Reduced hours per week	10%
Reduced salary/pay cut	6%
Lay-off	6%
Lost job	5%
Moved to a work from home environment	26%
Leave of absence	3%
Increased hours or shifts per week	6%
None of the above	53%

Base: total RESIDENTIAL respondents from the 2021 UtilityPULSE Database

Economic impact of COVID-19 pandemic	
	Commercial
Closed the business	20%
Laid off employees	29%
Experienced a significant decline in revenue (sales)	44%
Business continued during the pandemic	50%
Employees worked from home where practical	38%
Increased employee hours or shifts	13%
Reduced employee hours or shifts	38%
Experienced a significant increase in revenue (sales)	13%
None of the above	4%

Base: total COMMERCIAL respondents from the 2021 UtilityPULSE Database

Method

The findings in this report are based on telephone interviews conducted for Simul Corp. / UtilityPULSE by Logit Group between October 13 to October 21, 2021, with 405 respondents who pay or look after the electricity bills from a list of residential and small and medium-sized business customers supplied by Utilities Kingston.

The sample of phone numbers chosen was drawn randomly to ensure each business or residential phone number on the list had an equal chance of being included in the poll.

The sample was stratified so that 85% of the interviews were conducted with residential customers and 15% with commercial customers.

In sampling theory, in 19 cases out of 20 (95% of polls in other words), the results based on a random sample of 405 residential and commercial customers will differ by no more than ±4.87 percentage points where opinion is evenly split.

This means you can be 95% certain that the survey results do not vary by more than 4.87 percentage points in either direction from results that would have been obtained by interviewing all Utilities Kingston residential and small and medium-sized commercial customers if the ratio of residential to commercial customers is 85%:15%.

The margin of error for the sub-samples is larger. To see the error margin for subgroups, use the calculator at http://www.surveysystem.com/sscalc.htm.

Interviewers reached 3,085 households and businesses from the customer list supplied by Utilities Kingston. The 405 who completed the interview represent a 13% response rate.

The findings for the Simul/UtilityPULSE National Benchmark of Electric Utility Customers are based on telephone interviews conducted with adults throughout the country who are responsible for paying electric utility bills. The ratio of 85% residential customers and 15% small and medium-sized business customers in the National study reflects the ratios used in the local community surveys. The margin of error in the National poll is ±3.10 percentage points at the 95% confidence level. The margin of error in the Ontario poll is ±3.10 percentage points at the 95% confidence level.

For the National study, and the Ontario study, the sample of phone numbers chosen was drawn by recognized probability sampling methods to ensure each region of the country/province was represented in proportion to its population and by a method that gave all residential telephone numbers, both listed and unlisted, an equal chance of being included in the poll.

The data were weighted in each region of the country to match the regional shares of the population.

The margin of error refers only to sampling error; other non-random forms of error may be present. Even in true random samples, precision can be compromised by other factors, such as the wording of questions or the order in which questions were asked.

Random samples of any size have some degree of precision. A larger sample is not always better than a smaller sample. The important rule in sampling is not how many respondents are selected but how they are selected. A reliable sample selects poll respondents randomly or in a manner which ensures that everyone in the population being surveyed has an equal chance of being selected.

How can a sample of only several hundred truly reflect the opinions of thousands or millions of electricity customers within a few percentage points?

Measures of sample reliability are derived from the science of statistics. At the root of statistical reliability is probability, the odds of obtaining a particular outcome by chance alone. For example, the chances of having a coin come up heads in a single toss are 50%. A head is one of only two possible outcomes.

The chance of getting two heads in two coin tosses is less because two heads are only one of four possible outcomes: a head/head, head/tail, tail/head, and tail/tail.

But as the number of coin tosses increases, it becomes increasingly more likely to get outcomes that are either close to or exactly half heads and half tails because there are more ways to get such outcomes. Sample survey reliability works the same way but on a much larger scale.

As in coin tosses, the most likely sample outcome is the true percentage of whatever we are measuring across the total customer base or population surveyed. Next, most likely are outcomes very close to this true percentage. A statement of the potential margin of error or sample precision reflects this.

Some pages in the computer tables also show the standard deviation (S.D.) and the standard error of the estimate (S.E.) for the findings. The standard deviation embraces the range where 68% (or approximately two-thirds) of the respondents would fall if the distribution of answers were a normal bell-shaped curve. The spread of responses is a way of showing how much the result deviates from the "standard mean" or average. In the Utilities Kingston data on corporate image, Simul converted the answers to a point scale with 4 meaning agree strongly, 3 meaning agree somewhat, and so on (see in the computer tables).

For example, the mean score is 3.80 for providing consistent, reliable electricity. The average is 3.34 for provides information and tools to help customers manage electricity consumption.

For reliable electricity, the standard deviation is 0.43 . For provides information and tools to help customers manage electricity consumption, the Standard Deviation (S.D.) is 0.77. These findings mean there is a wider range of opinion – meaning less consensus – about help to manage electricity consumption vs Utilities Kingston energy supplies are reliable.

Beneath the S.D.. in the tables is the standard error of the estimate. The S.E. is a measure of confidence or reliability, roughly equivalent to the error margin cited for sample sizes. The S.E. measures how far off the sample's results are from the standard deviation. The smaller the S.E., the greater the reliability of the data.

In other words, a low S.E. indicates the answers given by respondents in a certain group (such as residential bill payers or women) do not differ much from the probable spread of the answers "predicted" in sampling and probability theory.

In certain instances, all of the sub-datasets from the entire UtilityPULSE database for 2021 were concatenated in order to use the average of all the control samples for comparison.

UtilityPULSE, through polls and surveys, provides executives and managers with customer feedback that assists in making strategic and operational decisions. You know lots of companies that can gather data and then give a report. We believe that by specializing in the utility sector with our polls and surveys, you get a stronger analysis of data and answers to critical questions that help you formulate key strategies to assist your leaders in creating a better place to work and a better place to do business with.

UtilityPULSE is uniquely positioned to help your utility get feedback from Customers through its Annual Electric Utility Customer Satisfaction Survey or customized research designed for you. In addition, we understand what it takes to create an organization where employees are engaged and enthusiastic about customers and their work.

We're the only research company with 23 continuous years of producing an independent Ontario and National benchmark.

Anyone can collect and present data – we believe understanding the industry before doing so is crucial.

Contact us when experience, expertise, and high standards are essential for your next customer engagement activity. We promise to listen to your needs and design and delivery a customer engagement activity or survey which meets your needs.

Your personal contact is:

David Malesich

Phone: (647)274-9420 E-mail: david@utilitypulse.com

EXHIBIT 1 – ADMINISTRATION

<u>Interrogatory 1-Staff-5</u>

Customer Engagement
Ref: Chapter 2A Filing Requirements for Small Utilities, page 10

Question(s):

As required in the Chapter 2A Filing Requirements, please document any communications with unmetered load customers, including street lighting customers, and how Kingston Hydro assisted them in understanding the regulatory context in which distributors operate and how it affects unmetered load customers.

<u>Response</u>

Kingston reached out to unmetered scattered load customers and did not receive any response from customers.

Kingston met with our largest street lighting customer on February 2, 2022. Kingston explained the ratemaking process including, but not limited to, cost allocation and answered questions from this street lighting customer.

EXHIBIT 1 – ADMINISTRATION

<u>Interrogatory 1-Staff-6</u>

OM&A per Customer
Ref: Exhibit 1, Tab 6, Schedule 1, page 3

Preamble:

Kingston Hydro provides OM&A per customer from 2016-2020 compared to the industry average.

Question(s):

a) Please provide a table comparing Kingston Hydro's OM&A per customer to utilities in the same cohort per the latest PEG benchmarking report as Kingston Hydro from 2016-2020.

<u>Response</u>

a) Table completed.

1

OMA Per Customer - Kingston's 2022 Cohorts						
	2016	**2017**	**2018**	**2019**	**2020**	**2021**
Alectra	270	238	238	254	261	234
Atikokan	668	704	680	681	700	682
Bluewater	379	378	385	371	357	347
Brantford	264	255	271	278	303	267
Centre Wellington	319	343	350	363	337	334
Elexicon	230	231	224	187	258	247
Erth	328	306	330	316	315	306
Festival	276	270	299	286	285	268
Fort Frances	467	455	461	471	451	430
Sudbury	306	302	322	331	329	310
Innpower	354	354	324	312	332	331
London	234	240	248	250	251	250
Niagara Peninsula	320	333	324	341	332	310
North Bay	242	273	263	281	284	283
Oakville	261	261	261	256	259	245
PUC	339	347	345	341	340	341
Renfrew	328	330	335	315	324	344
Synergy North	305	310	306	303	289	282
Tillsonburg	384	374	412	403	368	356
Waterloo North	236	246	262	259	247	258
Wellington North	470	459	454	478	488	469
Westario	250	267	234	251	254	278
Average	329	331	333	333	335	326
Median	313	308	323	314	320	308
Kingston	**260**	**258**	**276**	**260**	**266**	**237**
RANK	**6th lowest**	**6th lowest**	**9th lowest**	**7th lowest**	**7th lowest**	**2nd lowest**
% below Average	21%	22%	17%	22%	21%	**27%**
% below Median	17%	16%	15%	17%	17%	**23%**

EXHIBIT 1 – ADMINISTRATION

Interrogatory 1-Staff-7

Natural Gas and Electricity Study
Ref: Exhibit 1, Tab 9, Schedule 1, page 11

Preamble:

Kingston Hydro states that, with the recent release of the OEB's CDM Guidelines, Utilities Kingston is poised to undertake a study of both the natural gas and electricity systems in tandem, with unique insight deep into both businesses and systems. As customers across all rate classes work to transition to a low-carbon future, Kingston Hydro must ensure its grid is prepared to handle the additional load. This study will look to explore the likely impact of electrification on both systems and determine the most impactful and cost-effective non-wires alternative solutions.

Question(s):

a) Please provide a timeline for the study.
b) Please explain how Kingston Hydro intends to use the results of the study for future planning related to CDM and non-wires alternatives.

Response

a) Some time in 2023.

b) Kingston Hydro will use this study to gather information and assist with future capacity planning.

EXHIBIT 1 – ADMINISTRATION

Interrogatory 1-Staff-8

Implementing the Green Button Initiative
Ref: Exhibit 1, Tab 9, Schedule 1, page 11

Preamble:

Distributors are required to implement Green Button by November 1, 2023. The OEB has approved the establishment of a generic deferral account for rate regulated distributors to record the incremental costs directly attributable to the implementation of the Green Button initiative.

Kingston Hydro states that Utilities Kingston continues to work toward the implementation of Green Button Connect My Data and Download My Data functionality and that the multi-utility model structure of Utilities Kingston will allow for the harmonized implementation of the application across all customers, rate classes, and utilities.

Question(s):

a) ***Please provide Kingston Hydro's current progress of implementing the Green Button initiative. Does Kingston Hydro have a project plan in place to implement Green Button? If yes, please provide a high-level description of those plans. If not, please advise when the distributor expects to have a project plan in place.***

b) Please clarify if Kingston Hydro has recorded any incremental costs directly attributable to the implementation of the Green Button initiative in the generic deferral account.

c) Please confirm if Kingston Hydro has not proposed any capital or OM&A costs associated with the implementation of the Green Button initiative for the 2022 bridge year and the 2023 test year.

<u>Response</u>

a) Please see attached Kingston Hydro's latest progress report submitted to the OEB for the period ending July 31, 2022.

b) Kingston Hydro has not yet recorded any incremental costs directly attributable to the implementation of the Green Button initiative in the generic deferral account.

c) Kingston Hydro has not proposed any capital or OM&A costs associated with the implementation of the Green Button initiative for the 2022 bridge year and the 2023 test year. Kingston intends to review the project plan when finalized and then utilize the generic deferral account to record any incremental costs associated with Green Button implementation.

Response to Ontario Energy Board (OEB)

Interrogatory #1-Staff-8 (a)

Attachment 1 of 1

(Green Button Implementation Distributor Progress Report)

Ontario Energy Board

Green Button Implementation Distributor Progress Report

Reporting Period: May 1, 2022 - July 31, 2022

Distributor Name: Kingston Hydro Corporation

OEB Staff Question	Distributor Response
1. Has the distributor completed its implementation of Green Button consistent with O. Reg. 633/21? If yes, please advise of go-live date. If no, please answer questions 2-7 in this form.	No.
2. Has the distributor or its implementation vendor purchased and reviewed a copy of the NAESB ESPI standard version 3.3?	Yes.
3. Is the distributor managing Green Button implementation internally or through an external vendor?	Green Button implementation is being managed through an external vendor.
4. Does the distributor have a project plan to implement Green Button? If no, please advise when distributor expects to have a project plan in place.	Our project plan is not finalized and is waiting on further information from our vendor which we hope to have in Q3.
5. Please indicate the overall percentage of completion of the project plan.	5%
6. Please indicate when the distributor expects to begin testing with Green Button Alliance.	Unknown pending finalization of the project plan.
7. Please indicate the forecast go-live date	November, 2023

Submitted by:

Name: Randy Murphy

Title: CFO

Date: 8/29/22

EXHIBIT 1 – ADMINISTRATION

<u>Interrogatory 1-Staff-9</u>

Shared Model
Ref: Exhibit 1, Tab 9, Schedule 1, pages 13-14

Preamble:

Kingston Hydro has detailed the financial value of its Shared Service Model. Kingston Hydro states that estimated financial savings for OM&A for 2023 using the Ontario annual average inflation estimate of 2.3% per year, are calculated at just under $2 million per year or approximately $70 per customer per year.

Question(s):

a) Please provide details on the calculation of the $2 million per year total.
b) Please clarify whether the estimated financial savings have been reflected in the proposed 2023 OM&A. If so, please explain how. If not, please explain why not.

<u>Response</u>

a) In Kingston's last rebasing case, EB-2015-0083, Kingston provided significant analysis and evidence of the savings from the shared Services model.

Please see Table 1 on page 7 of Exhibit 1, Tab 2, Schedule 2 of that proceeding for further details. Table 1 illustrates OM&A savings of just over $1.65 million per year for 2014 and $1.67 million for 2015. Using annual Ontario CPI increases of 2.0%, 1.5%, 2.3%, 2.1%, 0.7% and 5.2% for 2016-2021 plus estimated CPI increases of 2.3% (the average of 2016-2021) for 2022 and 2023, the $1.67 million can be reasonably estimated at $2 million for 2023 and likely should be higher due to the July, 2022 Ontario CPI year to date percentage of 5.9%.

b) The estimated financial savings are reflected in the proposed 2023 OM&A through lower costing from the shared service model.

CCC Interrogatory #1

Ref: Ex. 1/T2/S1/p 3

Please provide all materials provided to Kingston Hydro's Board of Directors when seeking approval of the revenue requirement and rates that form the basis of this Application.

Response

See response to 1 SEC 1.

CCC Interrogatory #2

Ref: Ex.1/T2/S1/p. 4

The evidence states that additional operating expense in 2023 is due to lack of current organizational. Capacity to deal with current regulatory requirements and the distributed energy resources within the Kingston Hydro distribution area. Please explain the specific nature of these costs. Please provide a five-year forecast of DERs expected in the Kingston Hydro franchise area. Please describe the types of DERs that are expected.

Response

In Exhibit1/Tab2/Schedule1/p.2, we state that this application focuses on the need for additional resources to comply with increasing regulatory requirements and to achieve compliance with the increasing distributed energy resource applications within our distribution area.

The specific nature of these costs includes but is not limited to the following:

- Support of Net-Meter DER connections including:

    - Monthly manual meter reading of DER connections with bi-directional meters is required. Bidirectional meters have two meter registers compared to a single register of a standard load meter. Our current metering system stores these two meter registers in two different meter databases which requires bi-

directional meters to be manually read to ensure the data is retrieved from the correct meter register and saved in the correct meter database.
  - Monthly manual net-meter settlements because our existing CIS system does not have the ability to perform the net meter settlement method approved under O.Reg. 541/05.
  - Anticipated interest in third party net-meter settlements approved under O.Reg. 386/22 which will further complicate the administration associated with the net-meter settlement method approved under O.Reg. 541/05.

- Administration of annual gross load billing settlement with Hydro One for qualifying DERs within Kingston Hydro distribution area

- Administration duties to maintain compliance with the Distributed Energy Resources Connection Procedures (DERCP) Version 1.0 issued March 22, 2022 including:

  - Quarterly updates to restricted feeder list
  - Ongoing updates/clarifications to technical interconnection requirements
  - Increased complexity of capacity allocation process with increase in DER connections and applications
  - Resources to provide timely responses to DER applicants and maintain compliance with prescribed timelines

In addition to the new DERCP requirements, a Report on the Framework of Energy Innovation Working Group (FEIWG) to the Ontario Energy Board was issued July 6, 2022. The priority workstreams of the FEIWG is to:

- Investigate and support utilities' use of DERs they do not own as alternatives to traditional solutions to meet distribution needs; and

- Ensure that utilities' planning is appropriately informed by DER penetration and forecasts.

A five-year forecast of DER connections and the types of DERs expected can be found in DSP Appendix A section A1.2. This five-year DER forecast is based on historic trends and current pending DER applications, however, the industry landscape is rapidly changing. If the number of DER connections increases then it will further support the need for additional resources to investigate alternatives to traditional solutions to planning and distribution needs.

CCC Interrogatory #3

Ref: Ex. 1/T2/S1/p. 10

Please provide the impact on the revenue requirement assuming an ROE of 9%, 9.25% and 9.5% for 2023.

Response

With a ROE of 8.66%, Revenue Requirement is $14,987,724.
With a ROE of 9.00%, Revenue Requirement is $15,077,415.
With a ROE of 9.25%, Revenue Requirement is $15,143,365.
With a ROE of 9.50%, Revenue Requirement is $15,209,314.

Therefore a 0.25% change in ROE, impacts Revenue Requirement by approximately $66,000.

CCC Interrogatory #4

Ref: Ex. 1/T2/S1/Attachment 1

Kingston Hydro has provided its Strategic Plan for the period 2019-2024:

a) Please indicate when the Strategic Plan was complete;
b) Please describe the process Kingston Hydro uses to develop its Strategic Plans;
c) When will Kingston Hydro complete its next Strategic Plan?;
d) Please indicate how the COVID-19 Pandemic has affected Kingston Hydro's Strategic Plan;
e) Please indicate how the recent inflationary increases have impacted Kingston Hydro's Strategic Plan.

Response

a) The Kingston Hydro Strategic plan was adopted in 2019 and runs for five years to completion in 2024.

b) Kingston Hydro utilizes a mix of consulting services and internal planning resources to identify priorities and plans for review and consideration by the board. The process starts with a SWAT analysis of market and regulatory conditions and then proceeds through a comprehensive planning and evaluation process with the board.

c) Kingston Hydro will start the strategic planning process in Q4 2023 so that it is ready for adoption by the board in 2024.

d) The pandemic has not significantly affected Kingston Hydro's strategic plan. We believe that we are on track to make progress towards all of our strategic themes in the plan. The financial impact of Covid-19 and the recent inflationary increases are putting financial pressure on Kingston Hydro (as it is on all LDC's in the province) but this has not caused us to revisit our strategic focus. The strategic themes include:

- Leveraging the multi-utility model
- The power of local hydro
- Reliable infrastructure management
- Customer service excellence

Kingston Hydro continues to monitor supply chain issues and future supply chain issues may impact achievement of the strategic plan.

e) Recent inflationary increases have not significantly affected Kingston Hydro's strategic plan. We believe that we are on track to make progress towards all of our strategic themes in the plan. The recent inflationary increases are putting financial pressure on Kingston Hydro (as it is on all LDC's in the province) but this has not caused us to revisit our strategic focus. The strategic themes include:

- Leveraging the multi-utility model
- The power of local hydro
- Reliable infrastructure management
- Customer service excellence

Having said the above, continued inflationary increases beyond 2022 may impact the ability of Kingston Hydro to achieve all the items in the plan.

CCC Interrogatory #5

Ref: Ex. 1/T2/S1/Attachment 1/p. 5

In the Strategic Plan it states that, "Through its shared services model Kingston Hydro passes on more than $1.8 million in annual savings to customers". Please explain the nature of the savings achieved. Please explain how the $1.8 million in savings was derived.

Response

See response to 1-SEC-5.

CCC Interrogatory #6

Ref: Ex. 1/T2/S1/Attachment 1/p. 19

Three specific initiatives regarding leveraging external shared services are set out in the Strategic Plan. Please explain the extent to which each of these initiatives impacts the 2023 revenue requirement and in what way. Please explain how these initiatives will impact Kingston Hydro's costs for the period 2023-2027.

Response

Initiative 1

An example of this is our collaboration with the GridSmartCity® group. For example, this application has been prepared under the assumption that Kingston's appeal to the Superior Court on the reassessment of Smart Meters will be successful. The collaboration with some GridSmartCity® partners helped shape the decision to proceed with an appeal top the court. The successful appeal will allow Kingston Hydro ratepayers to afford the benefit of faster CCA write-offs and thus lower PILs in rates particularly when the fleet of Smart Meters needs to be replaced near the end of the IRM period.

Initiative 2

An extension of the multi-utility model beyond Kingston will help Kingston Hydro through the ability to find further efficiencies from the multi-utility model by sharing experiences with and learning from others.

Initiative 3

The opportunity to acquire the remaining assets within the City of Kingston would lead to greater efficiencies for Kingston Hydro, and particularly those customers who are not currently benefiting from the multi-utility model. E.g. Kingston Hydro residential customers' current winter monthly bill approximates $113.90. Kingston residential customers residing outside Kingston Hydro's distribution territory have a current winter monthly bill of approximately $127.90.

CCC Interrogatory #7

Ref: Ex. 1/T2/S1/Attachment 1/p. 20

The Strategic Plan refers to an Initiative to – Ensure a fair and balanced return to the Shareholder: establish return on equity and dividend projections for 2019-2024. Please provide the following:

a) The actual and Board-approved ROE since Kingston Hydro's rebasing;
b) The ROE and dividend projections for 2023-2027;
c) Kingston Hydro's dividend policy.

Ref: Ex. 1/T2/S1/Attachment 1/p. 21

The Strategic Plan refers to an Initiative to prepare recommendations for the Board on infrastructure investments for 2025-2035, which anticipate the state of the grid in 25-50 years. Have these recommendations been developed? If so, please provide these recommendations.

Response

a) Kingston's Board-approved ROE was 9.19% for 2016-2021. Kingston actual achieved ROE for the 2016-2021 years has been 6.43%, 7.82%, 7.48%, 9.50%, 7.25% and 8.39%.

b) ROE projections for 2023-2027 are 8.66%, 8.49%, 8.16%, 7.88% and 7.62% respectively. Dividend projections for 2023-2027 are $1,150,000, $1,400,000, $1,400,000, $1,500,000 and $1,500,000.

c) In 2013, the Board of Directors approved the following policy, for long term planning purposes only. It has not been used by the Board to declare and pay dividends.

> *"It is recommended that for long term financial planning purposes, the Board of Directors approve a dividend policy that ensures that the shareholder receives an annual return of 4.25% on its total share and debt investment; and THAT the 4.25% annual return above be calculated based on the following formula:*
>
> *4.25% multiplied by the sum of the average of the long term note payable to the City of Kingston during the year and the shareholders equity (excluding contributed surplus) at the beginning of the year."*

The recommendations referred to in Ex. 1/T2/S1/Attachment 1/p. 21 have not yet been developed due to insufficient resources.

<u>CCC Interrogatory #8</u>

Ref: Ex. 1/T5/S1/Attachment 1

Please indicate whether Kingston Hydro sought input regarding the level of allowed ROE embedded in rates. If this was not discussed during the customers engagement please explain why. Are Kingston Hydro's customers aware of the fact that included in rates is an allowed ROE? If not, why not?

<u>Response</u>

Kingston did not seek input into the level of allowed ROE embedded in rates. This was not discussed as Kingston's focus was on our Distribution System Plan and operational requirements. Kingston is under the understanding that the level of ROE is an OEB related policy decision point. Kingston believes that the OEB, as an independent and impartial public agency will make decisions that serve the public interest while ensuring a financially viable and efficient energy sector that provides customers with reliable energy services at a reasonable cost.

Kingston does not know if its customers are aware of the fact that included in rates is an allowed ROE.

CCC Interrogatory #9

Ref: Ex. 1/T5/S1/Attachments 1-2

Kingston Hydro undertook customer engagement in 2019. Does Kingston Hydro still believe this engagement is relevant to its current capital plan?

Response

Yes. Kingston Hydro undertook customer engagement in 2019 and 2021. Both the 2019 and 2021 engagement reports were used to develop the capital plan.

Interrogatory 1-SEC-1

[Ex.1-3-13, p. 4] Please provide all material provided to the Kingston Hydro's Board of Directors regarding its approval of this application, and the underlying budgets.

Response

Please see attachments.

Response to School Energy Coalition (SEC)

Interrogatory #1-SEC-1

Attachment 1 of 3

(Kingston Hydro Report KH08-22:
2022 – 2026 Financial Plan)

Motion: KH08-22
Date: January 31, 2022
Meeting No. 2022-01

Kingston Hydro

Moved By: **Seconded By:**

To: The Board of Directors

From: David Fell, President and CEO, Kingston Hydro Corporation

Prepared by: Randy Murphy, CFO and Corporate Secretary,

Subject: 2022 - 2026 Financial Plan

It is recommended that the Board of Directors approve the following to be included as part of the 2023 cost of service rate application:

- ***2023 Operating, maintenance, and administration expenditures of $8,161,000,***
- ***2023 Power expenditures of $92 million,***
- ***2023 Net capital Expenditures of $3,230,000; and***

That the Board approve the 5 year financial plan for the period 2022-2026

Background

Included as Appendix A to this report is financial information as follows:

- 2020 audited information,
- 2021 and 2022 projected assets, liabilities as of December 31 as well as projected revenues and budgeted operating and capital expenditures for each year,
- 2023 budgeted revenues, operating and capital expenditures and resultant projected assets and liabilities that would result in new distribution rates based on the projected cost of service rate application filing.
- 2024-2026 projected financial plan

Carried: ____________ **Defeated:** ____________ **Chair:** ____________

Capital Asset Program

The 2023 Capital Budget for Kingston Hydro is $3,229,500 as per the Kingston Hydro Board approved distribution system plan. The breakdown by Ontario Energy Board Investment Categories, is as follows, with comparison to 2022:

Investment Category	2022	2023
System Access	$901,626	$882,500
System Renewal	$2,390,000	$1,490,000
System Service	$215,000	$75,000
General Plant	$297,000	$782,000
Total	$3,803,626	$3,229,500

Revenue, Expenditures and Net Earnings

Distribution revenue for 2023 is budgeted at 10% more than 2022 or $1,372,000. This increase is based on the expected revenue requirement calculation based on the cost of service rebasing.

Operating expenses for 2023 are budgeted at $8,160,000, a 4.5% increase compared to the 2022 operating budget of $7,807,000 (excluding the $350,000 electric cost of service rate application).

The major components of the 4.5% increase are as follows:

- General inflationary increases of $150,000 or 2%.
- Increase to OEB cost assessment not previously in rates of $36,000
- Additional wage increases totaling $150,000 to reflect additional pay for journeypersons at $1.50 per hour and additional electrical engineer to oversee distributed energy and impacts of electrification to the distribution system.
- Increase in insurance and bad debt expense of $25,000.

For 2023, the Company has projected Net earnings of $2,357,000 compared to $1,344,000 for 2022.

Return on Equity

The return on equity has been projected at the current OEB prescribed rate of 8.66% for 2023.

Banking Covenants

The banking covenants have been reviewed for the 2022-2026 period and the covenants are expected to be met.

TD Bank Covenants

Our debt to capitalization (debt plus equity) ratio is expected to be in the range of 0.38 to 0.36 to 1.00. The maximum threshold is 0.60 to 1.00.

Our debt service ratio – the amount of cash available each year to service existing yearly 3rd party debt payments - is expected to be in the range of 1.61 to 2.16 to 1.00 for 2022. The minimum threshold is 1.20 to 1.00.

Infrastructure Ontario Covenants

Our debt to total assets is expected to be in the range of 41% to 39%. The maximum allowed is 60%.

Our debt service ratio coverage ratio is expected to be in the range of 2.34 to 2.79 to 1.00. The minimum allowed is 1.30 to 1.00.

Return to Shareholder

The Company will pay interest to the City of Kingston at a rate of 5.87% on the shareholder loan of $10,880,619. Total amount of annual interest paid amounts to $638,692, which is expected to be $256,000 more than what is included in our revenue requirement approval from the OEB.

The Company paid dividends of $1,500,000 in 2021 based on 2020 actual earnings and the projected financial plan. Kingston Hydro is not expected to pay dividends in 2022 based on 2021 results. As a reminder, this was due to the decision to finish Substation 1 in advance of the original date due to the reliability risks associated with delaying the work past 2021. Representatives of the shareholder were previously made aware of this and again in November 2021 as the municipal budgets for 2022 were finalized.

Based on the attached financial plan, 2022 financial plan, dividends are expected to resume in the spring of 2023 in the amount of approximately $1,150,000 increasing to $1,500,000 per year at the year 2026. Actual dividend payments will be based on actual financial results and annual decisions of this Board.

Appendices

Appendix A – 2020-2026 Forecasted Statements of Financial Position and Comprehensive Income

Kingston Hydro Corporation
Statement of Financial Position

	Audited 31-Dec 2020	Pro-Forma 31-Dec 2021	Pro-Forma 31-Dec 2022	Pro-Forma 31-Dec 2023	Pro-Forma 31-Dec 2024	Pro-Forma 31-Dec 2025	Pro-Forma 31-Dec 2026
Assets							
Current assets:							
Cash	66,184	9,500	9,500	9,500	9,500	9,500	9,500
Due from City of Kingston	6,628,073	6,749,209	7,509,846	7,664,818	7,444,839	7,394,673	7,253,077
Miscellaneous accounts and Billed revenue receivable	8,201,524	8,201,524	8,406,562	8,616,726	8,832,144	9,052,948	9,279,272
Payments in lieu of corporate income taxes receivable	103,589						
Unbilled revenue	7,060,315	7,060,315	7,236,823	7,417,743	7,603,187	7,793,267	7,988,098
Inventory	1,803,341	1,803,341	1,848,425	1,894,635	1,942,001	1,990,551	2,040,315
Prepaid expenses	156,282	156,282	160,189	164,194	168,299	172,506	176,819
	24,019,308	23,980,171	25,171,345	25,767,617	25,999,970	26,413,445	26,747,081
Non-current assets:							
Cost - In Service	75,663,626	80,595,899	84,399,899	87,629,399	90,944,199	94,046,199	97,084,199
Cost - Works in progress	232,273	300,000	300,000	300,000	300,000	300,000	300,000
Accumulated depreciation	-14,131,064	-16,766,997	-19,345,222	-21,946,927	-24,587,657	-27,267,999	-29,988,546
	61,764,835	64,128,902	65,354,677	65,982,472	66,656,542	67,078,200	67,395,653
Derivative asset	0	0	0	0	0	0	0
Deferred tax asset	0	0	0	0	0	0	0
Total assets	85,784,143	88,109,073	90,526,022	91,750,089	92,656,511	93,491,645	94,142,734
Regulatory deferral accounts debit balances	4,952,888	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000
Covid receivables		584,041	584,041				
Total assets and regulatory balances	90,737,031	91,693,114	94,110,063	94,750,089	95,656,511	96,491,645	97,142,734
Liabilities and Shareholder's Equity							
Current liabilities							
Bank loans - current portion of LTD	$ 814,977	911,191	966,850	1,012,578	1,045,262	1,083,674	1,135,838
Bank loans - LTD maturing within a year							
Accounts payable & accrued liabilities	8,439,142	8,439,142	8,650,121	8,866,374	9,088,033	9,315,234	9,548,115
Deposits payable	1,263,006	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
	10,517,125	10,350,333	10,616,970	10,878,951	11,133,295	11,398,908	11,683,952
Long --term debt							
Note payable to City of Kingston	10,880,619	10,880,619	10,880,619	10,880,619	10,880,619	10,880,619	10,880,619
Long-term debt	25,563,677	25,586,358	26,592,968	26,547,829	26,486,287	26,387,664	26,239,178
Derivative liability	275,545	275,545	275,545	275,545	275,545	275,545	275,545
Deferred revenue	5,999,198	5,799,198	5,599,198	5,399,198	5,199,198	4,999,198	4,799,198
Deferred tax liability	1,308,439	1,308,439	1,308,439	1,308,439	1,308,439	1,308,439	1,308,439
Employee future benefit liabilities	1,446,038	1,446,038	1,446,038	1,446,038	1,446,038	1,446,038	1,446,038
Total liabilities	55,990,641	55,646,530	56,719,778	56,736,619	56,729,420	56,696,411	56,632,969
Shareholder's equity							
Share Capital	12,380,617	12,380,617	12,380,617	12,380,617	12,380,617	12,380,617	12,380,617
Contributed Surplus	3,893,103	3,893,103	3,893,103	3,893,103	3,893,103	3,893,103	3,893,103
Accumulated other comprehensive income (loss)	(202,527)	(202,527)	(202,527)	(202,527)	(202,527)	(202,527)	(202,527)
Retained earnings	17,489,279	18,649,136	18,492,837	20,850,063	22,013,684	22,881,827	23,696,358
less Dividends paid in year	-400,000	-1,500,000	0	-1,150,000	-1,400,000	-1,400,000	-1,500,000
	3.2%	11.8%	0.0%	7.9%	9.5%	9.4%	9.9%
Total equity	33,160,472	33,220,329	34,564,030	35,771,256	36,684,877	37,553,020	38,267,551
Total Liabilities and Shareholder's Equity	89,151,113	88,866,859	91,283,808	92,507,875	93,414,297	94,249,431	94,900,520
Regulatory deferral account credit balances	948,901	2,065,241	2,065,241	2,065,241	2,065,241	2,065,241	2,065,241
Covid deferred revenue		584,041	584,041				
Deferred tax associated with regulatory accounts	637,017	176,973	176,973	176,973	176,973	176,973	176,973
Total equity, liabilities, and regulatory deferral account balances	90,737,031	91,693,114	94,110,063	94,750,089	95,656,511	96,491,645	97,142,734

Kingston Hydro Corporation
Statement of Comprehensive Income

Year ended December 31	Audited 2020	Forecast 2021	Budget 2022	Forecast 2023	Forecast 2024	Forecast 2025	Forecast 2026
Energy sales	$86,251,238	$87,976,263	$89,735,788	$91,530,504	$93,361,114	$95,228,336	$97,132,903
Cost of energy	86,232,285	87,976,263	89,735,788	91,530,504	93,361,114	95,228,336	97,132,903
	18,953	-	-	-	-	-	-
Other regulatory income	675,980	600,000	600,000	600,000	600,000	600,000	600,000
Other non regulatory income	165,529						
Distribution revenue	12,584,492	12,729,366	13,111,247	14,482,754	14,699,995	14,920,495	15,144,303
	13,444,954	13,329,366	13,711,247	15,082,754	15,299,995	15,520,495	15,744,303
Operating expenses:							
Contracted services	7,364,433	7,510,000	8,157,000	8,160,180	8,323,384	8,489,851	8,659,648
Non regulatory expenses	165,529						
Depreciation and Amortization	2,357,091	2,635,933	2,578,225	2,601,705	2,640,731	2,680,342	2,720,547
	9,887,053	10,145,933	10,735,225	10,761,885	10,964,114	11,170,193	11,380,195
Earnings (loss) before finance costs, taxation and net movement in regulatory account balances	3,557,901	3,183,433	2,976,022	4,320,869	4,335,881	4,350,303	4,364,108
Other Finance Income (Costs)	140,982	90,000	50,000	-	-	-	-
Finance Costs - Bank loans	- 843,224	- 816,302	- 820,879	- 875,971	- 942,892	- 1,011,454	- 1,089,083
Finance Costs - Related party	- 638,692	- 638,692	- 638,692	- 638,692	- 638,692	- 638,692	- 638,692
Earnings (loss) before taxation and net movement in regulatory account balances	2,216,967	1,818,439	1,566,451	2,806,206	2,754,297	2,700,157	2,636,333
Income tax - Current	207,791	258,582	222,749	448,981	440,676	432,014	421,802
Income tax - Future	294,935						
	502,726	258,582	222,749	448,981	440,676	432,014	421,802
Net earnings (loss) before movement in regulatory deferral account balances	1,714,241	1,559,857	1,343,701	2,357,225	2,313,621	2,268,143	2,214,531
Net movement of regulatory deferral balances related to profit or loss	182,968	-	-	0	0	0	0
Net earnings and net movements in regulatory deferral account balances	1,897,209	1,559,857	1,343,701	2,357,225	2,313,621	2,268,143	2,214,531
Other comprehensive income (loss)							
Change in Fair Value of Cash Flow Hedge	- 190,749	-	-				
Total comprehensive income	$ 1,706,460	$ 1,559,857	$ 1,343,701	$ 2,357,225	$ 2,313,621	$ 2,268,143	$ 2,214,531

Response to School Energy Coalition (SEC)

Interrogatory #1-SEC-1

Attachment 2 of 3

(Kingston Hydro Report KH023-22:
2023 Cost of Service Rate Application)

Motion: KH23-22
Date: May 16, 2022
Meeting No. 2022-04

Moved By: **Seconded By:**

To:	The Board of Directors
From:	David Fell, President and CEO
Prepared by:	Randy Murphy, CFO and Corporate Secretary,
Subject:	2023 Cost of Service Rate Application

It is recommended that the Board of Directors endorse the information contained within the Appendices to this report and approve the following to be included as part of the 2023 cost of service rate application:

- ***2023 Operating, maintenance, and administration expenditures of $8,313,253,***
- ***2023 Power expenditures of $73 million,***
- ***2023 Net Capital Expenditures of $3,230,000; and***

That the Board approve the preliminary total revenue requirement of $15 million and authorize the submission of the cost of service application to the Ontario Energy Board including any adjustments that may be required to total revenue requirement prior to submission provided that total distribution revenue conforms to the goals and initiatives of Theme 2 – The Power of Local Hydro, of the Kingston Hydro Strategic Plan.

Background

During the meeting the Chief Financial Officer will speak to the Appendices attached to this report and explain to the Board the impact to distribution revenue as currently drafted.

Carried: ____________ **Defeated:** ____________ **Chair:** ____________

Appendices

Data Input [1]

		Initial Application
1	**Rate Base**	
	Gross Fixed Assets (average)	$79,352,818
	Accumulated Depreciation (average)	($19,501,678)
	Allowance for Working Capital:	
	Controllable Expenses	$8,313,253
	Cost of Power	$72,935,768
	Working Capital Rate (%)	7.50%
2	**Utility Income**	
	Operating Revenues:	
	Distribution Revenue at Current Rates	$13,480,241
	Distribution Revenue at Proposed Rates	$14,175,513
	Other Revenue:	
	Specific Service Charges	$167,888
	Late Payment Charges	$65,229
	Other Distribution Revenue	$448,567
	Other Income and Deductions	$130,209
	Total Revenue Offsets	$811,893
	Operating Expenses:	
	OM+A Expenses	$8,175,531
	Depreciation/Amortization	$2,627,291
	Property taxes	$137,722
	Other expenses	
3	**Taxes/PILs**	
	Taxable Income:	
	Adjustments required to arrive at taxable income	($1,320,112)
	Utility Income Taxes and Rates:	
	Income taxes (not grossed up)	$255,517
	Income taxes (grossed up)	$347,642
	Federal tax (%)	15.00%
	Provincial tax (%)	11.50%
	Income Tax Credits	$ -
4	**Capitalization/Cost of Capital**	
	Capital Structure:	
	Long-term debt Capitalization Ratio (%)	56.0%
	Short-term debt Capitalization Ratio (%)	4.0%
	Common Equity Capitalization Ratio (%)	40.0%
	Prefered Shares Capitalization Ratio (%)	0.0%
		100.0%
	Cost of Capital	
	Long-term debt Cost Rate (%)	3.75%
	Short-term debt Cost Rate (%)	1.17%
	Common Equity Cost Rate (%)	8.66%
	Prefered Shares Cost Rate (%)	

Allowance for Working Capital - Derivation

Controllable Expenses		$8,313,253		$ -		$8,313,253		$ -		$8,313,253
Cost of Power		$72,935,768		$ -		$72,935,768		$ -		$72,935,768
Working Capital Base		$81,249,021		$ -		$81,249,021		$ -		$81,249,021
Working Capital Rate %	(1)	7.50%	(3)	0.00%		7.50%		0.00%		7.50%
Working Capital Allowance		$6,093,677		$ -		$6,093,677		$ -		$6,093,677

Rate Base

Particulars		Initial Application
Gross Fixed Assets (average)	(2)	$79,352,818
Accumulated Depreciation (average)	(2)	($19,501,678)
Net Fixed Assets (average)	(2)	$59,851,140
Allowance for Working Capital	(1)	$6,093,677
Total Rate Base		$65,944,817

Capitalization/Cost of Capital

Line No.	Particulars	Capitalization Ratio		Cost Rate	Return
		Initial Application			
		(%)	($)	(%)	($)
	Debt				
1	Long-term Debt	56.00%	$36,929,097	3.75%	$1,384,030
2	Short-term Debt	4.00%	$2,637,793	1.17%	$30,862
3	**Total Debt**	60.00%	$39,566,890	3.58%	$1,414,892
	Equity				
4	Common Equity	40.00%	$26,377,927	8.66%	$2,284,328
5	Preferred Shares	0.00%	$ -	0.00%	$ -
6	**Total Equity**	40.00%	$26,377,927	8.66%	$2,284,328
7	**Total**	100.00%	$65,944,817	5.61%	$3,699,220

Revenue Deficiency/Sufficiency

Line No.	Particulars	Initial Application: At Current Approved Rates	Initial Application: At Proposed Rates
1	Revenue Deficiency from Below		$695,273
2	Distribution Revenue	$13,480,241	$13,480,240
3	Other Operating Revenue Offsets - net	$811,893	$811,893
4	**Total Revenue**	$14,292,134	$14,987,406
5	Operating Expenses	$10,940,544	$10,940,544
6	Deemed Interest Expense	$1,414,892	$1,414,892
8	**Total Cost and Expenses**	$12,355,436	$12,355,436
9	**Utility Income Before Income Taxes**	$1,936,698	$2,631,970
10	Tax Adjustments to Accounting Income per 2013 PILs model	($1,320,112)	($1,320,112)
11	**Taxable Income**	$616,586	$1,311,858
12	Income Tax Rate	26.50%	26.50%
13	**Income Tax on Taxable Income**	$163,395	$347,642
14	**Income Tax Credits**	$ -	$ -
15	**Utility Net Income**	$1,773,303	$2,284,328
16	**Utility Rate Base**	$65,944,817	$65,944,817
17	Deemed Equity Portion of Rate Base	$26,377,927	$26,377,927
18	Income/(Equity Portion of Rate Base)	6.72%	8.66%
19	Target Return - Equity on Rate Base	8.66%	8.66%
20	Deficiency/Sufficiency in Return on Equity	-1.94%	0.00%
21	Indicated Rate of Return	4.83%	5.61%
22	Requested Rate of Return on Rate Base	5.61%	5.61%
23	Deficiency/Sufficiency in Rate of Return	-0.77%	0.00%
24	Target Return on Equity	$2,284,328	$2,284,328
25	Revenue Deficiency/(Sufficiency)	$511,026	($0)
26	**Gross Revenue Deficiency/(Sufficiency)**	$695,273 (1)	

Revenue Requirement

Line No.	Particulars	Application
1	OM&A Expenses	$8,175,531
2	Amortization/Depreciation	$2,627,291
3	Property Taxes	$137,722
5	Income Taxes (Grossed up)	$347,642
6	Other Expenses	$ -
7	Return	
	Deemed Interest Expense	$1,414,892
	Return on Deemed Equity	$2,284,328
8	**Service Revenue Requirement (before Revenues)**	$14,987,406
9	Revenue Offsets	$811,893
10	**Base Revenue Requirement (excluding Tranformer Owership Allowance credit adjustment)**	$14,175,513
11	Distribution revenue	$14,175,513
12	Other revenue	$811,893
13	**Total revenue**	$14,987,406
14	**Difference (Total Revenue Less Distribution Revenue Requirement before Revenues)**	($0)

Utility Income

Line No.	Particulars		Initial Application
	Operating Revenues:		
1	Distribution Revenue (at Proposed Rates)		$14,175,513
2	Other Revenue	(1)	$811,893
3	Total Operating Revenues		$14,987,406
	Operating Expenses:		
4	OM+A Expenses		$8,175,531
5	Depreciation/Amortization		$2,627,291
6	Property taxes		$137,722
7	Capital taxes		$ -
8	Other expense		$ -
9	Subtotal (lines 4 to 8)		$10,940,544
10	Deemed Interest Expense		$1,414,892
11	Total Expenses (lines 9 to 10)		$12,355,436
12	**Utility income before income taxes**		$2,631,970
13	Income taxes (grossed-up)		$347,642
14	**Utility net income**		$2,284,328

Response to School Energy Coalition (SEC)

Interrogatory #1-SEC-1

Attachment 3 of 3

(Kingston Hydro Report KH39-21:
Kingston Hydro Cost of Service Rate Application –
Distribution System Plan)

Motion: UK39-21
Date: November 29, 2021
Meeting No. 2021-06

Moved By: **Seconded By:**

To:	The Board of Directors
From:	J. A. Keech, President and CEO, Kingston Hydro Corporation
Prepared by:	J. Miller, Chief Operating Officer, Utilities Kingston
Subject:	Kingston Hydro Cost of Service Application – Distribution System Plan

Recommendation

That the Kingston Hydro Corporation Board of Directors approve the 2023-2027 Kingston Hydro Distribution System Plan.

Background

As part of Kingston Hydro's Cost of Service (CoS) application to be submitted to the Ontario Energy Board (OEB) for the establishment of electrical distribution rates, a Distribution System Plan (DSP) is required to be part of the filings. The DSP is similar in its intent to an asset management plan and capital expenditure plan by detailing the long term (2023 to 2027) capital asset activity of the local distribution company.

In this report the Board is requested to approve the DSP to enable subsequent filing with the OEB.

Carried: ____________ **Defeated:** ____________ **Chair:** ____________

The Distribution System Plan (DSP)

The DSP reflects an integrated and holistic approach to planning, prioritizing and managing Kingston Hydro's assets. The OEB has directed distributors to present their investments into four categories:

System Access; System Renewal; System Service; and General Plant.

Kingston Hydro has followed these categories which are defined as follows:

> System Access: Investments that are modifications (including asset relocation) to a distributor's distribution system that a distributor is obliged to perform to provide a customer (including a generator customer) or group of customers with access to electricity services.
>
> System Renewal:
> Investments involve replacing and/or refurbishing system assets to extend the original service life of the assets and thereby maintain the ability of the distribution system to provide customers with electricity services.
>
> System Service:
> Investments that are modifications to a distributor's distribution system to ensure it continues to meet the distributor's operational objectives while addressing anticipated future customer electricity service requirements.
>
> General Plant
> Investments that are modifications, replacements or additions to a distributor's assets that are not part of its distribution system, including land and buildings; tools and equipment, rolling stock and electronic devices and software used to support day to day business and operational activities.

Historical

For background and for comparative purposes we have included the forecasted capital expenditure pattern for our last CoS application covering the 2015 to 2020 period.

	Historic Spending by Category 2015-2020								
Investment Category	2015	2016	2017	2018	2019	2020	Total	Average	% of Total
System Access	$ 230,237	$ 703,309	$ 574,023	$ 391,844	$ 589,733	$ 752,339	$ 3,241,485	$ 540,247	**11.8%**
System Renewal	$ 2,842,518	$ 4,956,786	$ 3,052,622	$ 3,746,122	$ 3,538,316	$ 3,002,703	$ 21,139,066	$ 3,523,178	**76.7%**
System Service	$ 20,953	$ 15,851	$ 60,339	$ 462,186	$ 112,851	$ 88,314	$ 760,493	$ 126,749	**2.8%**
General Plant	$ 295,544	$ 393,194	$ 496,450	$ 474,471	$ 584,958	$ 164,233	$ 2,408,850	$ 401,475	**8.7%**
Total	**$ 3,389,252**	**$ 6,069,141**	**$ 4,183,433**	**$ 5,074,622**	**$ 4,825,859**	**$ 4,007,588**	**$ 27,549,894**	**$ 4,591,649**	100.0%

During this period, system renewal activities accounted for 77% of the total capital expenditures with access at 12%, service at 3% and general at 8%. The emphasis on system renewal is a function of our distribution territory and the age and condition of our assets. The renewal of distribution assets – the replacement of assets at the end of their life cycle was the key driver in the previous application. Kingston Hydro has historically seen minimal load growth and does not experience significant “greenfield” development and therefore our expenditure patterns do not reflect significant investments in system access which was only 11%.

Forecast:

Since our last rate application, we sought two deferrals related to filing our rate application due to Covid -19 pandemic issues. During this period staff continued to update our long-term planning, maintained contacts with majour customers, assessed local development activities within our distribution territory and monitored trends, changes and regulations that would impact our future capital planning for our assets. The following represents an overview of our forecasted investments.

		Forecast Spending by Category 2022-2027								
Investment Category		2022	2023	2024	2025	2026	2027	Total	Average	**% of Total**
System Access		$ 901,626	$ 882,500	$ 1,232,500	$ 1,052,500	$ 900,000	$ 925,000	$ 5,894,126	$ 982,354	**30.1%**
System Renewal		$ 2,390,000	$ 1,490,000	$ 1,150,000	$ 1,540,000	$ 1,325,000	$ 1,685,000	$ 9,580,000	$ 1,596,667	**48.8%**
System Service		$ 215,000	$ 75,000	$ 210,300	$ 75,000	$ 357,000	$ 80,000	$ 1,012,300	$ 168,717	**5.2%**
General Plant		$ 297,000	$ 782,000	$ 722,000	$ 434,500	$ 456,000	$ 433,750	$ 3,125,250	$ 520,875	**15.9%**
Total		**$ 3,803,626**	**$ 3,229,500**	**$ 3,314,800**	**$ 3,102,000**	**$ 3,038,000**	**$ 3,123,750**	**$ 19,611,676**	**$ 3,268,613**	100.0%

What is evident between the historical expenditure patterns of Kingston Hydro and the forecasted expenditure pattern outlined in our DSP is a changing environment within our service area that is being reflected in our investment categories. These changes can be summarized in the following ways:

1. The intensification policies of the City Kingston are focusing new development to the older urban core areas of the City which is primarily Kingston Hydro’s service area; and,
2. Upper and local level government initiatives to reduce GHG emissions that are targeted at the MUSH sector, a significant component of Kingston Hydro’s customer base, are maturing rapidly.

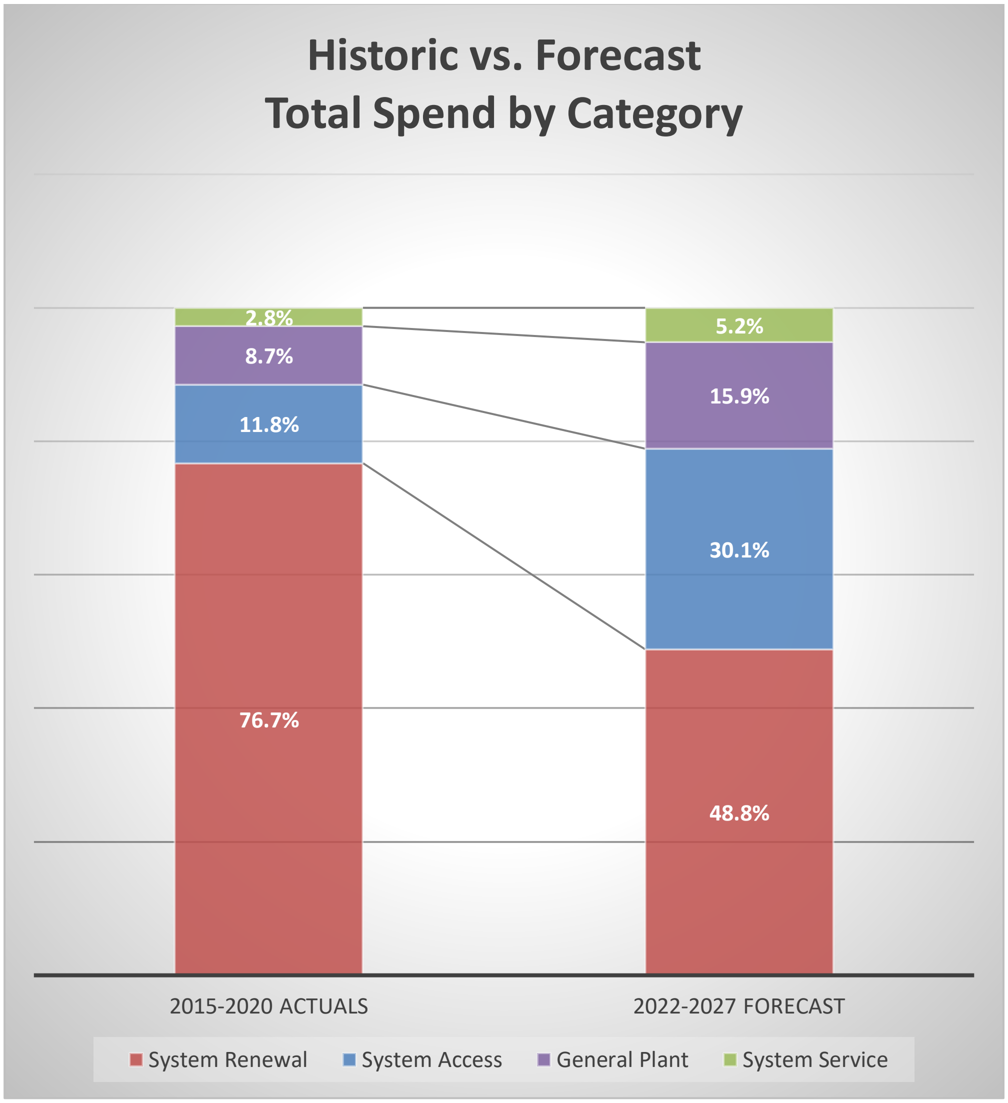
The City of Kingston’s direction to continue to intensify growth within the existing urban boundaries is placing new demands on Kingston Hydro’s distribution system for electrical supply. The Williamsville corridor in the City is the most obvious and current example of that recent trend in development given the amount of new mixed-use construction occurring in that area. The recent policy approvals for Williamsville combined with new population projections are translating into increased electrical demand and load on the existing system.

In addition, the City is also developing similar policies and projections for intensification for the North Kingstown Area, Central Kingston Growth Area and Density by Design and are indicators of further changes intended to promote and enhance intensification activities that will impact hydro services. While conservation activities have historically assisted in mitigating demand/load impacts, current and predicted demand indicate that system access and expansion investments are required to meet customer demand for service. This is a relatively new issue for Kingston Hydro that has typically seen low to moderate new development activity.

Electrification and GHG reduction plans (electric vehicle & fleet decisions, heating etc.) are also predicted to place upward pressure on load growth during this planning period. Government initiatives that require or influence a market response to reduce GHG emissions (fuel switching) are impacting government-controlled sectors such as universities, schools, hospitals and government offices. Consultations with our majour customers (Hospitals, CFB Kingston, University, City) have confirmed active and deliberate capital and financial planning to address this initiative in the coming years, with one customer moving to implementation of a multi-phase plan in 2022. It is expected that additional pressure on electrical demand will occur. These issues will however, require ongoing monitoring during the 2022-2027 period to ensure appropriate timing of system upgrades to meet customer demand.

The City of Kingston's shift from greenfield/suburban development to intensification which has been underway for several years, is now beginning to manifest itself by increasing the demand/consuming the available capacity on our existing distribution systems. That combined with GHG reduction activities are indicators that distribution improvements will be needed to service new load/customers.

To ensure that Kingston Hydro is positioned to meet the anticipated customer demand for service a shift in historical capital investments is forecasted for the 2022 to 2027 period. Although asset renewal activities remains' significant to Kingston Hydro's ongoing asset management activities (48%) it is noted that this area is being reduced by some 28% from previous years. This reflects the need to acknowledge new demands on our resources to support load growth. System access, which relates system improvements, has traditionally represented between 12-14% of total capital investments and is forecasted to increase during this period to 30% of our forecasted expenditures during the planning period.



Overall, total capital investments between the two periods are forecasted to decrease. During the 2015-2020 period the average capital spend per year was approximately $4.6 million as compared to the forecasted (2022-2027) average yearly expenditure of $3.2 million. This forecasted decrease is a reflection of the following factors:

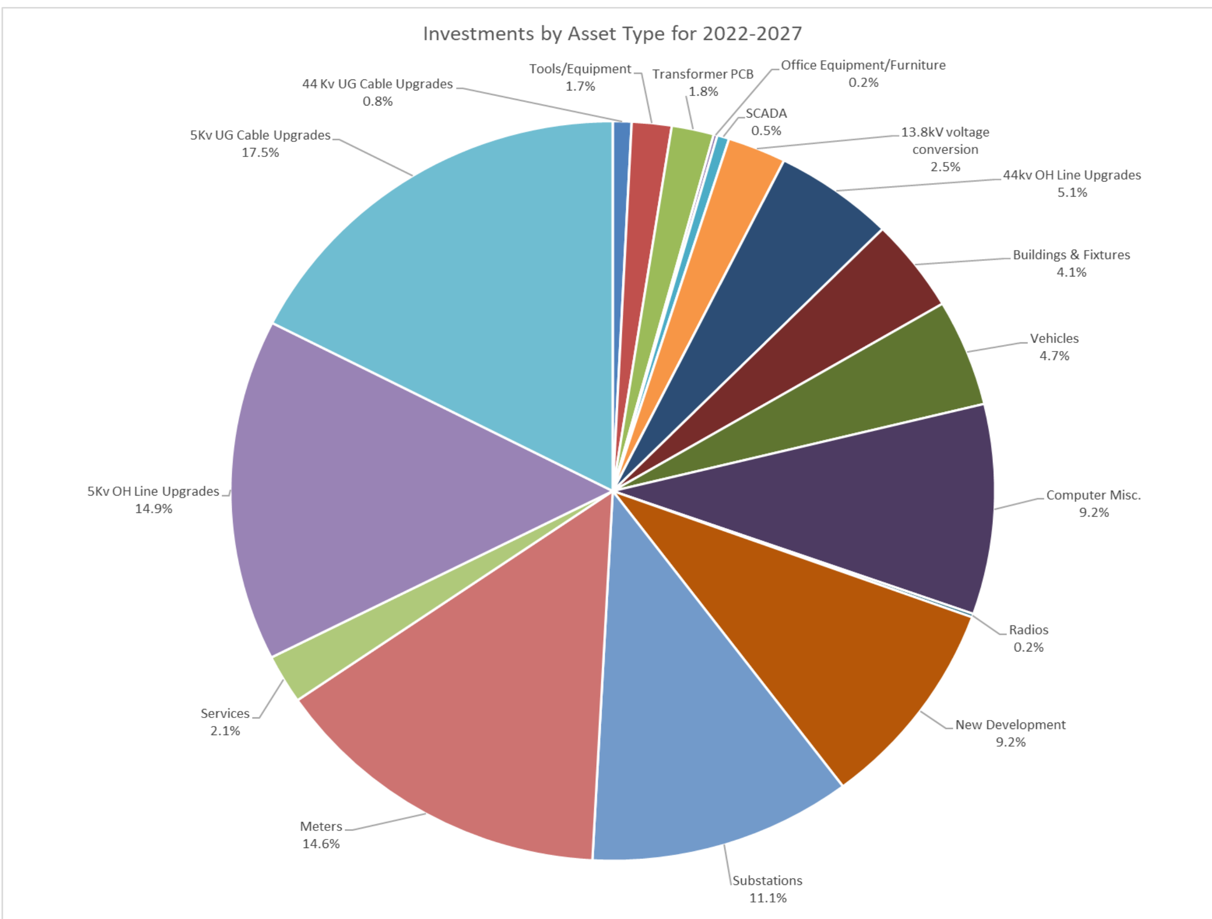
- Reductions in deteriorated pole replacements as a result of previous investments
- Substation No1 rebuild is complete; and
- Princess St (Phase 4) reconstruction is completed.

Given the significant investment in overhead poles over the last 4-6 years investments in this category have declined given the progress made on the back log of replacements. The

Substation 1 rebuild program was at the time (2016) acknowledged to be a significant budget issue for Kingston Hydro throughout the 2016-2020 period. The MS #1 project (nearly completed) and the Princess St rebuild (Ph 4), completed no longer influence expenditures. Both projects represented significant capital investments for Kingston Hydro that are no longer impacting investments going forward, enabling a reduction in overall expenditures.

As a consequence, our next planning period will focus on both asset renewal and system access investments. This strategic direction enables Kingston Hydro to remain focused on matters of system reliability created though redundancy and asset renewal and matters of safety for the public and workers and ensure the distribution system is positioned to meet customer expectations and load growth as a result of new development and climate action.

The following chart provides a review of the forecasted investments by asset type for the 2022-2027 period.



The following elaborates further on areas of expenditure and the type of work being undertaken. This work continues to address assets found within our Health Indices (asset condition) as needing attention and matters related to load growth.

- $2.1 million has been earmarked for Kingston Hydro capital related to new development (cable and transformers) and service replacements
- $525K for 13.8kV conversion/expansion of lines for new development in Williamsville and Davis Tannery
- $155K for 44kV Underground cable replacement at Substation MS2 (this station serves Williamsville)
- $575K for 44kV Overhead Line and Switch upgrades
- $2.44 million for 5kV Overhead line upgrades
  - Approx. $600K is allocated to spot replacement of deteriorated poles
- $2.9 million for 5kV Underground upgrades
  - Approx. $1million is allocated to Vault upgrades
  - $100K is allocated to unplanned/spot replacement of PILC cables).
  - Many projects involve prioritized replacement of 5kV PILC cables that egress out of substations
- $915K for new vehicles
- $1.8 million for computer hardware/software
- $2.8 million for meter replacements
- $350K for removing/destroying transformers containing PCBs

Attached for review in Appendix A, is a copy of the current DSP document. It should be noted that some sections of the DSP are awaiting 2021 actuals for reporting, so those areas will be added as year-end financials become available. Additional editing is still to be performed as well. None of the remaining activities relating to the DSP, would materially change the document.

<u>Future Considerations:</u>

Starting in 2020 Utilities Kingston staff became involved in a Regional Planning Study undertaken by the Independent Electrical System Operating (IESO). This item culminated in a final report issued by the IESO in November of this year. Unlike previous Regional Planning Studies, this review resulted in the identification of several system issues at the transmission level that will impact Kingston Hydro. These are outlined in a separate report to the Board, but the significant item is the forecasted need for a new Transmission facility within the 20-year planning horizon. The implications of the study, for the current DSP are minimal in nature at $400,000 to facilitate preliminary study and engineering work. Based on forecasted load growth we anticipate the need to undertake this work during this DSP period, but the significant expenditures are forecasted beyond the 2027 period and likely within the next DSP planning period. The need for this work will be closely monitored given the long lead time to design, construct and commission these types of facilities.

With the implementation and installation of smart meters many years ago it was recognized that at some point the replacement of those meters (asset management and life cycle) was going to impact Kinston Hydro. Electric meters are subject to Measurement Canada regulations and are given a “seal” life. Those seals validate the accuracy of the meters installed and extensions in time to the expiry date of the seal can be approved by Measurement Canada through sample testing. Our fleet of smart meters is closing in on the end of their first seal extension. Those meters originally installed to every residential customer in our distribution area over a 2- year, theoretically must be replaced at the same time unless we proactively manage their replacement over an extended time period. The current DSP in years 2025 to 2027 begins the process of gradually replacing smart meters to mitigate the impact on future capital planning. This issue will likely have a more significant impact on future DSP’s beyond the 2027 period.

Although the DSP is primarily focused on asset management and capital investments there is a relationship between asset renewal activities and O&M activities and costs. For this DSP we want to acknowledge the significant capital investments that have been made in electric assets over the years and what we are now seeing as a gradual declining trend in O&M expenses being incurred. This positive trend line we believe can be attributed to the work done on our assets over the years and felt this noteworthy for the Board’s attention.

Summary:

Overall, the proposed level of investment over the period of 2022 to 2027 is $19,611,676 representing a reduced investment from the previous 5-year plan. This forecasted investment in Kingston Hydro represents a prudent investment strategy that balances the requirements for system renewal, system access and appropriate financial management for the long term. It is recommended that the Board approve the Distribution System Plan for Kingston Hydro.

Appendices

Appendix A – Kingston Hydro Distribution System Plan

Interrogatory 1-SEC-2

[Ex.1] Please provide copies of all benchmarking studies, reports, and analyses that Kingston Hydro has undertaken, or participated in, since the filing of its last Custom IR application, that are not already included in the application.

Response

Kingston believes it has filed all reports etc. except for the response to Board Staff IR 4 staff 58.

Kingston participates in MEARIE Management salary survey. The results of which are included in the following:

The 2020 MEARIE survey is available in the case record for EB-2021-0016: https://www.rds.oeb.ca/CMWebDrawer/Record/746505/File/document

The 2021 MEARIE survey is available in the case record for EB-2022-0049: https://www.rds.oeb.ca/CMWebDrawer/Record/751846/File/document

Interrogatory 1-SEC-3

[Ex.1] With respect to productivity and efficiency measures:

a) Please provide details of all productivity and efficiency measures that Kingston Hydro has undertaken since its Custom IR application. Please quantify the savings and explain how they were calculated.

b) Please provide details of all productivity and efficiency measures that Kingston Hydro plans to undertake in the test year. Please quantify the savings and explain how they were calculated.

Response

a) Kingston Hydro has been part of Kingston's multi-utility model since 2000 and continues to be 18% below average in OM&A per customer in Ontario.

Kingston Hydro's efficiency ranking for the 3 year period 2018-2020 was -3.1% improving -1.8% from -1.3% for the 2017-2019 period. Kingston Hydro notes that its efficiency for the 2-year period 2019-2020 was -5.3%. Kingston Hydro ranks 11th best out of 27 LDCs in its efficiency assessment for its cohort group.

In response to Board staff 1 Staff 6, Kingston illustrates that it is 2^{nd} lowest OM&A per customer in its 23-member cohort.

Kingston Hydro ranked 12th lowest of 59 utilities in 2020 on a total cost per customer basis.

All of the above relates to the unique advantages of the multi utility model in addition to an operating culture of ensuring great value for money spent.

We specifically want to comment on the work recently completed at substation MS1. The upgrades to MS1 carried a total budget of $5.6 million with actuals at around 10% less than the estimated budget. The results of this project completed on time and below budget, highlight the attention to budget management and the productive and efficient completion of work by our internal staff.

b) Kingston would refer to Exhibit 1, Tab 7, Schedule 1 for initiatives it is planning to facilitate innovation which should increase productivity and achieve greater efficiency.

In addition to the proposals noted in the Schedule noted above, Kingston Hydro makes the following comments:

Included in the application is a forecasted PEG model which indicates Kingston Hydro will move to cohort number 2 in 2024.

The multi-utility model will continue as long as Kingston Hydro is able to keep pace with its neighbouring utilities, particularly with respect to regulatory compliance and facilitating the electrification initiatives of our customers located in the central part of Kingston.

Kingston will continue to monitor and analyze Activity and Program-based Benchmarking (APB) Results. Part of the role of the new electrical engineer and regulatory analyst will be to monitor industry practices, research areas where we could be more efficient and recommend new and changes to existing programs to achieve even greater efficiencies in addition to the excellent results we continue to report.

Interrogatory 1-SEC-4

[Ex.1-3-13, p. 9 and Attach. 1] The Services Agreement between Kingston Hydro and 1425445 Ontario Limited (Utilities Kingston) expires on September 16, 2022:

a) Has the Service Agreement been renegotiated?
b) If so, please provide a copy of the revised Services Agreement and detail any changes to its terms.
c) If no, what is the intention for the Services Agreement?
d) One of the strategic initiatives in Kingston Hydro's Strategic Plan is to maintain one president and CEO for both Kingston Hydro and Utilities Kingston. How does Kingston Hydro ensure that there is no conflict of interest, perceived or otherwise, in the dealings between the two entities?

Response

a) The service agreement will be renewed by the Utilities Kingston Board of Directors on September 19 and by the Kingston Hydro Board of Directors on September 26.

b) Draft renewal agreement attached.

c) Not applicable.

d) The 2 Boards of Directors have separate Chairs and separate independent directors as required by the Affiliate Relationships Code. The Kingston Hydro Board is responsible for the corporate governance practices of that Corporation and review and approve appropriate reports, budgets, financial statements etc. that it must as a licensed and regulated local distribution company. Conflict of interest perceived or otherwise if it occurs is dealt with during a board meeting when the president and CEO declares a conflict and abstains from voting.

Response to School Energy Coalition (SEC)

Interrogatory #1-SEC-4 (b)

Attachment 1 of 1

(Services Agreement between Kingston Hydro Corporation and 1425445 Ontario Limited)

SERVICES AGREEMENT

This Agreement ~~made this~~effective the ~~-~~17th day of

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September, ~~2017~~ 2022 Between:

Kingston Hydro Corporation (Kingston Hydro)

and

1425445 Ontario Limited (Utilities Kingston)

WHEREAS Kingston Hydro has been incorporated as a business corporation pursuant to the provision of section 142 of the Electricity Act, 1998;

AND WHEREAS Utilities Kingston has been incorporated as an affiliated business corporation of Kingston Hydro, as defined in the Business Corporation Act (Ontario) pursuant to Sections 71 and 73 of the Ontario Energy Board Act, 1998;

AND WHEREAS Kingston Hydro wishes to contract with Utilities Kingston to provide certain services described in Schedule "A" attached hereto as part of this Agreement;

AND WHEREAS Utilities Kingston has agreed to the provide the services as described in Schedule "A" in a diligent and timely manner in accordance with this Agreement;

THIS AGREEMENT WITNESSES that, in consideration of the mutual ~~convenants~~covenants and agreements herein contained, the parties hereby covenant and agree with each other as follows:

1.1 Definitions

a) "ARC" means the Affiliate R~~r~~elationships Code issued by the Ontario Energy Board

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~~a)~~b) "Business" means the electrical distribution business of Kingston Hydro as governed by the Licence.

~~b)~~c) "~~CICA~~CPA Canada" means the Chartered Professional Accountants of Canada~~Canadian Institute of Chartered Accountants~~.

~~c)~~d) "City" means the Corporation of the City of Kingston

~~d)~~e) "Licence" means the license to distribute electricity issued by the Ontario Energy Board

~~e)~~f) "Records" means the bookkeeping, accounting and record keeping system maintained by Utilities Kingston

2.0 TERM

Unless terminated in accordance with Article 16.0, the term of this Agreement shall be from September 17, ~~2017~~ 2022 to and including September 16, 202~~2~~7.

3.1 OBLIGATIONS OF KINGSTON HYDRO

a) Kingston Hydro shall be responsible for establishing rates and charges for services provided to customers in its ~~licenced~~licensed distribution area ~~the City of Kingston~~ subject to the approval of the Ontario Energy Board.

b) Kingston Hydro shall be responsible for approving an annual capital and operating financial plan as prepared by Utilities Kingston.

4.1 OBLIGATIONS OF UTILITIES KINGSTON

a) Utilities Kingston shall be responsible for all aspects of the operation, maintenance, and management of the Business in accordance with Prudent Industry Practice and the terms of this Agreement throughout the term, including without limitation, providing all necessary staff to operate the Business.

b) Utilities Kingston shall abide by and ensure that its officers, employees, agents and representatives abide by the provisions of all applicable municipal, provincial and federal legislation, including, without limitation, the by-laws and resolutions of the City of Kingston, the Electricity Act, 1998, the Ontario Energy Board Act, 1998, relevant provisions of the Licence and any directives that may be issued by Kingston Hydro from time to time with regard to the electricity distribution business and the service described in Schedule "A" attached hereto. The foregoing obligation shall survive the termination of this Agreement and shall continue until any applicable statutory limitation period has expired.

c) Utilities Kingston shall perform periodic reviews to ensure compliance with the Affiliate Relationships Code and provide Kingston Hydro with copies of those reviews.

d) In fulfilling it duties and responsibilities pursuant to this Agreement, Utilities Kingston agrees to comply with all reasonable instructions received ~~for~~ from Kingston Hydro.

5.1 RECORDS

a) Utilities Kingston shall keep records conforming to the requirements prescribed from time to time by Kingston Hydro including but not limited to the Reporting and Record Keeping requirements of the Ontario Energy Board and the accounting standards mandated by CPA Canada.~~provisions of the CICA.~~

b) Utilities Kingston shall keep it records associated with the services to be provided separate from any records associated with any other activities to be carried on by Utilities Kingston, as required by section 72 of the Electricity Act, 1998 and the Licence.

c) Utilities Kingston shall furnish Kingston Hydro with access to such records, including copies of documents therefrom as Kingston Hydro may require from time to time.

d) Utilities Kingston agrees that Kingston Hydro shall have the right, upon twelve (12) hours notice to Utilities Kingston, to enter Utilities Kingston's premises during business hours to conduct an audit of Utilities Kingston's records in respect of the management of the electricity distribution business and the provision of services pursuant to this Agreement

6.0 CONFIDENTIAL INFORMATION

The parties recognize that in accordance with the ARC, all information that Utilities Kingston receives from Kingston Hydro relating to specific customers, retailers or generators is confidential information and Utilities Kingston undertakes that such confidential information shall not be disclosed by it, except as may be necessary in the proper discharge of it duties under this Agreement, or used for any purpose other than the specific business purposes for which it received the confidential information. Utilities Kingston shall ensure that those employees who have access to such confidential information agree to abide by the ARC and Utilities Kingston's undertaking. The foregoing obligation shall survive the termination of this Agreement.

7.1 MANAGEMENT AND PERSONNEL

a) Utilities Kingston acknowledges that it is solely responsible for the control and management of its employees.

b) Utilities Kingston shall provide sufficient qualified management, supervisory and operations personnel and support services to provide the management and delivery of the services under this Agreement, including the appropriate supervision for all such personnel.

c) Utilities Kingston shall be responsible for the administering the payroll obligations for all employees and shall comply with applicable collective agreements, provincial legislation and payroll obligations including without limitation, federal and provincial income taxes, insurance premiums, contributions to benefit and compensations plans and similar obligations. Utilities Kingston shall maintain in good standing WSIB premiums, pursuant to provincial law covering all its employees who may be employed to provide services under this Agreement.

8.1 PAYMENTS

a) Kingston Hydro agrees to reimburse all expenses without markup that are incurred in the fulfillment of this Agreement and that have been appropriately allocated by Utilities Kingston.

b) Kingston Hydro may, at its own expense, conduct an audit of Utilities Kingston's financial records, including the allocation of expenses under this Agreement.

9.1 INSURANCE

Utilities Kingston shall obtain and keep in force during the term of this Agreement, for the protection of Utilities Kingston and Kingston Hydro insurance coverage as follows:

a) Comprehensive general, bodily injury and property damage liability insurance with limits of not less than $5,000,000 inclusive per occurrence for bodily injury, death and damage to property including loss ~~therof~~thereof.

b) Umbrella coverage with limits of not less than $10,000,000 per occurrence.

c) Automobile liability insurance with respect to the licensed vehicles which have limits of not less than $5,000,000 per occurrence in the following forms endorsed to provide both parties with not less than 15 days notice in advance of any cancellation, change or amendment respecting coverage:

   i) Standard non-owned automobile policy including standard contractual liability endorsement

   ii) Standard owners forms automobile policy providing third party liability and accident benefits insurance and covering licensed vehicles owned or operated by or on behalf of Utilities Kingston.

d) All Risks Contractors' Equipment Insurance covering construction machinery and equipment used by Utilities Kingston for maintenance and repair of Kingston Hydro's distribution lines, poles and installations and extensions and additions thereto.

e) Such other coverage as may be agreed upon by the parties.

f) Such coverages shall be in the joint names of Utilities Kingston and Kingston Hydro with loss payable to Utilities Kingston and Kingston Hydro as their respective interests may appear.

10.0 INDEMNIFICATION

The parties shall defend, fully indemnify and hold harmless each other and their respective officers, employees, agents and representatives, from any and all manner of actions, causes of action, proceedings, claims, demands, penalties, fines and costs, including without limitation, all legal costs and disbursements that might be incurred, which other party may suffer, or which may hereafter be sustained or incurred by reason of, or in any way arising out of such damage, loss or injury, including death to any property or person, as a result of its failure or negligence, or its failure at any time to comply with the provisions of this Agreement.

11.1 AUTHORIZED REPRESENTATIVES

a) Kingston Hydro hereby appoints the Chair of Kingston Hydro as its authorized representative to deal with Utilities Kingston, with authority to act for and on behalf of Kingston Hydro respecting the day to day administration of this Agreement.

b) Utilities Kingston hereby appoints the President and Chief Executive Officer of Utilities Kingston as its authorized representative to deal with Kingston Hydro, with authority to act on behalf of Utilities Kingston respecting the day to day administration of this Agreement.

12.0 FAILURE TO COMPLY

The failure of either party to enforce or insist upon compliance with any of the terms and conditions of this Agreement, or a waiver of any default under this Agreement, shall not constitute a general waiver or relinquishment of any such term or condition, or of any subsequent default of the same or any other term or condition of this Agreement, but the same shall be and remain at all times in full force and effect.

13.0 FORCE MAJEURE

Neither of the parties shall be liable for delay in or failure to perform their respective obligations under this Agreement when such failure is caused by events beyond the reasonable control of either party, such as fire, explosion, flood, act of God or inevitable accident, civil disorder or disturbance, vandalism, war, riot, sabotage, weather or energy related closings, governmental actions or regulations, nor for real or personal property destroyed or damaged due to such events; in the event of catastrophe, the parties obligations shall cease until the cause of such delay or failure is resolved or repaired. The parties shall explore all reasonable avenues available to avoid or resolve events of force majeure in the shortest possible time.

14.0 STRIKES

In the event of a strike the parties shall use reasonable efforts to perform their obligations under this Agreement at a satisfactory level as mutually agreed upon by them. The compensation terms of this Agreement may be modified to allow for changes in service or requirements during the period of the strike.

15.1 DISPUTE RESOLUTION

a) The Parties agree to consult each other and to negotiate in good faith to resolve any differences or disputes which either Party may have relating to the interpretation, application or implementations of this Agreement, or any dispute which may arise over any costs, fees or other costs incurred and failing agreement the Parties agree to resolve their disputes by arbitration as provided in Article 15.0 (b)

b) Arbitration of a dispute shall be commenced by written notice by a party requesting arbitration to the other, which notice shall identify the issue or issues it wishes to submit to arbitration. Within thirty (30) days of the notice, the Parties shall agree upon a single arbitrator and failing agreement then each Party shall appoint an arbitrators and the two appointees shall within forty-five (45) days of the notice of arbitration appoint a third person who shall act as Chair of the arbitration panel and failing agreement the Chair shall be appointed by a judge of the Superior Court of Ontario pursuant to the provisions of the *Arbitration's Act,* RSO 1991 c.A 17.

c) The commencement of the arbitration and all rules of procedure for the arbitration shall be by agreements of the Parties, or failing agreement, as determined by the arbitrator or Chair of the arbitrator panel. The provisions of the *Arbitration*~~'s~~ *Act,* ~~R~~SO 1991 c.~~A~~ 17 as amended or any successor legislation shall apply to the arbitration.

16.1 TERMINATION

a) Events of Termination

i) If either party breaches a material term of this Agreement, the non breaching party shall give written notice to the other of such breach; if the breach is remedied within 15 days, the notice shall be null and void; if the breach is not or cannot be remedied by the breaching party within the 15 days as aforesaid or within such longer period as may have been stipulated for in such notice, the Agreement may be terminated at the discretion of the non-breaching party. Said termination shall take effect 30 days from the end of the notice period.

ii) If either party goes in to receivership or gives notice of insolvency or pending insolvency, the other party may elect to terminate this Agreement.

b) Notice of Termination

Either party may terminate this agreement at any time upon six (6) months written notice to the other party.

17.0 NOTICES

Any notice or communication required or permitted to be given under this Agreement shall be valid only if delivered in writing in accordance with this clause.

Notices can be provided as follows:

Kingston Hydro:

Mayor of the City of Kingston
Kingston City Hall
216 Ontario Street,
Kingston, ON
K71 2Z3

Utilities Kingston:

President and Chief Executive Officer
85 Lappan's Lane
Kingston, ON
K7L 4X7

18.0 AMENDMENTS

No amendment to this Agreement shall be of any force or effect unless by writing and signed by both parties.

19.0 SEVERABILITY

If any term or provision of this Agreement is held by a competent authority to be invalid, illegal or unenforceable for any reason, the reaming provisions of this Agreement and it Schedule shall continue in full force and effect.

20.0 ASSIGNMENT

This Agreement may not be assigned by either party to a third party without the written consent of the other party.

21.0 GOVERNING LAW

This Agreement shall be construed and enforced in accordance with the laws of the Province of Ontario.

22.0 TIME OF THE ESSENCE

Time is of the essence in the Agreement and all of the provisions in it.

23.0 ENTIRE AGREEMENT

This Agreement, together with the Schedule attached hereto ~~constitutes the~~constitutes the entire agreement between the parties with respect to the matters herein and supersedes all prior oral or written representations.

IN WITNESS WHEREOF, the parties have duly executed this Agreement.

For Kingston Hydro Corporation	For 1425445 Ontario Limited (o/a Utilities Kingston)
________________________ Mayor Bryan Paterson Chair	________________________ ~~James Keech~~David Fell President and CEO
________________________ Randy Murphy Treasurer	________________________ ~~Sean Meleschuk~~Nancy Taylor Chair, Governance Nominations and Compensation Committee, ~~Corporate Secretary~~Board of Directors

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SCHEDULE A

SCOPE OF SERVICES

Utilities Kingston shall have authority during the Term to manage, control, administer and operate the Business in accordance with Prudent Industry Practice, subject to overall responsibility for management by the Senior Officers and the Board of Directors of Kingston Hydro.

Without limited the generality of the foregoing, Utilities Kingston shall be vested with the following powers which it will exercise on behalf of Kingston Hydro:

a) to report to the management and Board of Directors of Kingston Hydro with respect to the business and affairs of Kingston Hydro as may be requested from time to time by Kingston Hydro;

b) to provide all administrative services for the business of Kingston Hydro including accounting and bookkeeping services

c) to negotiate, execute, amend, administer, perform and carry out the terms of all agreements and commitments, the performance of which by or on behalf of Kingston Hydro in respect of the Business and the Business is necessary or advisable; and

d) to operate and maintain the Business in accordance with Prudent Industry Practice, applicable laws and all Kingston Hydro agreements, to minimize unscheduled outages and to provide maintenance in the most cost effective manner to prevent deterioration beyond normal wear and tear; provided that such efforts shall be necessarily limited by the operating life, capacity and maintenance requirements of the facilities and by the requirements of applicable laws and requirements of the Kingston Hydro distribution licence;

e) to obtain and maintain all necessary regulatory and operational approvals including those required form the Ontario Energy Board and the Independent Electricity System Operator for the Business and renewals therefore including preparing and submitting all associated applications and filings

f) to provide administrative services for the Business including:

   i) arrange insurance for the Business consistent with Prudent Industry Practice

   ii) maintain and preserve equipment maintenance, accounting, management of billing and receivables, banking and other necessary records, reports, documents, data and the like for the Business

iii) perform cash management services for the Business

iv) on a timely basis prepare financial statements and deliver them to Kingston Hydro's Board of Directors

v) assist in the administration of all agreements to which Kingston Hydro is a party or by which it is bound, including negotiations and communications with third parties in connection therewith; and

vi) make all banking and financing agreements;

g) to plan, project manage and execute all capital works as approved by the Board of Kingston Hydro;

h) perform for Kingston Hydro such other services as may from time to time be reasonably requested or are necessary or appropriate in connection with the operation and maintenance of the facilities

Interrogatory 1-SEC-5

[Ex.1-5-1, Attach. 1, Ex. 1-9-1, p. 14] The 2019 Customer Engagement Presentation slide 7 states 'Our model yields savings for customers of approximately $3 million per year', $1.9M of which is identified as specific savings for Kingston Hydro customers. Please file on the record of this proceeding, the referred to information from EB-2015-0083 which shows how these amounts are determined.

Response

We attach the report submitted in EB-2015-0083. It was included as Exhibit 1, Tab 2, Schedule 2, Attachment 1. This attachment was prefaced by the writeup at Exhibit 1, Tab 2, Schedule 2 of that proceeding.

Response to School Energy Coalition (SEC)

Interrogatory #1-SEC-5

Attachment 1 of 1

(Collins Barrow: Specified Auditing Procedures –
Utilities Kingston Organizational Considerations)

Utilities Kingston

Specified Auditing Procedures
Utilities Kingston Organizational Considerations

For Analyses Prepared in 2014

Collins Barrow

Utilities Kingston
Specified Auditing Procedures - Utilities Kingston Organizational Considerations
For Analyses Prepared in 2014

Contents

Collins Barrow

Collins Barrow SEO LLP
1473 John Counter Blvd., Suite 201
Kingston, Ontario
K7M 8Z6 Canada

T. 613.544.2903
F. 613.544.6151

www.collinsbarrow.com

Report on Specified Auditing Procedures Performed on Utilities Kingston Reorganization Considerations

To the Management of Utilities Kingston

As specifically agreed, we have performed the following procedures in connection with the Utilities Kingston's cost/benefit analysis related to specific internal organizational considerations as prepared by Management as of November 2014.

- Compared supporting documentation to cost/benefit analysis.

- Assessed the reasonability of assumptions used in each cost/benefit analysis.

- Tested that assumptions were accurately applied in each analysis.

- Tested the mathematical accuracy of each cost/benefit analysis.

As a result of the above procedures, we found no exceptions. However, these procedures do not constitute an audit of the company's financial statements or the assumption figures and, therefore, we express no opinion on the on operating costs relied upon in the cost/benefit calculations.

This report is for use solely in communications between Utilities Kingston management and governing committees.

Collins Barrow SEO LLP

Chartered Professional Accountants
Licensed Public Accountants

Kingston, Ontario
April 17, 2015

Utilities
Kingston

Multi-Utility Model Benefits

Title: 3 – Single Management Representation on Projects

Financial Benefits Summary

Item/Description	Labour				Total
Cost to Kingston Hydro	$ 1,100	$ -	$ -	$ -	$ 1,100
Cost to Kingston Hydro if separate	$ 3,600	$ -	$ -	$ -	$ 3,600
Savings to Kingston Hydro	**$ 2,500**	**$ -**	**$ -**	**$ -**	**$ 2,500**

Financial Details (Provide calculations and assumptions used)

- See "3 – Single Management Representation on Projects.xlsx"
- Utilities Kingston Model
  - Assume Director sent to represent all utilities
  - Assume director cost is $68.75/hr (Includes benefits)
  - Assume 4 meetings per project
  - Assume 1.5 hours per meeting
  - Assume 0.5 hour travel time per meeting
  - Assume total time per meeting is 2 hours
  - Assume total time per project is 8 hours
  - Total cost per project is $550
  - Assume 8 Projects per year
  - Total Cost per year $4,400
  - Kingston Hydro Corporation Share is $1,100/year
  - Water/Waste Water/Gas share is $3,300/year
- If Separate Model
  - Assume manager sent from each utility (Electric, Water, Waste Water, Gas)
  - Assume manager cost is $56.25/hr
  - Assume 4 meetings per project
  - Assume 1.5 hours per meeting
  - Assume 0.5 hour travel time per meeting
  - Assume total time for each representative per meeting is 2 hours
  - Total time per project is 32 hours
  - Total Cost per project is $1,800
  - Assume 8 projects per year
  - Total cost per year $14,400
  - Each Utility Cost $3,600

Customer Benefits Summary

- Lower cost per project results in more money available for infrastructure renewal for all of the utilities.
- One representative also ensures the utility portion of the project is managed as a cohesive whole, instead of separate companies looking out for themselves.
- The project owner has a single point of contact for all utilities on the project, this makes it easier to manage that aspect of the project.

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Full Description

Kingston is an active municipality for construction activities. There is a real push on revitalizing the urban landscape in Kingston, which involves major construction projects. Road reconstructions, major building developments, and movie shots are some examples of the kind of work happening in Kingston.

The Utilities Kingston model allows for a single representative on these projects, typically at the director level of the organization. The single Utilities Kingston representative is able to be responsible for the utilities managed. This results in less labour hours on projects as there is one representative for electric, gas, water, waste water, instead of one for each utility.

There is also a benefit in having a senior leader representative. This allows for decisions to be made and concepts to be developed much closer to real time, rather than having to develop ideas and obtain senior leader approval after the fact.

Utilities Kingston

Multi-Utility Model Benefits

Title: 5 – Single Notice of Project on Multi-Utility Builds

Financial Benefits Summary

Item/Description	Project Cost				Total
Cost to Kingston Hydro	$ 900,000	$ -	$ -	$ -	$ 900,000
Cost to Kingston Hydro if separate	$ 1,000,000	$ -	$ -	$ -	$ 1,000,000
Savings to Kingston Hydro	**$ 100,000**	**$ -**	**$ -**	**$ -**	**$ 100,000**

Financial Details (Provide calculations and assumptions used)

- See "5 – Single Notice of Project on Multi-Utility Builds.xlsx"
- "Notice of Project" is a process used by the Ministry of Labour to establish construction site responsibility for the health and safety of workers. With separate companies there are limits to how close they can work before the main contractor must assume responsibility for other workers. Outside of the Utilities Kingston model this doesn't happen so there is extra time to maintain separation between contractors.
- Utilities Kingston Model;
  - Assume Single Notice of Project results in 20% savings in time per project.
  - Assume $2,000,000 construction project total value (Infrastructure renewal preceding a city block road reconstruction)
  - Assume 50% of the total value is attributed to labour
  - Assume 20% savings on labour component yields a total project value of $1,800,000
  - Assume 2 Projects per year
  - Assume KHC Share is 25% of total, $900,000 total per year
  - Assume Water/Waste Water/Gas share is 75% of total, $2,700,000 total per year.
- If Separate Model;
  - Assume $2,000,000 construction project total value (Infrastructure renewal preceding a city block road reconstruction)
  - Assume 2 Projects per year
  - Assume Electric, Water, Waste Water, and Gas each pay for 25% of total
  - Assume Electric Cost is $1,000,000 per year
  - Assume Water/Waste Water/Gas cost is $3,000,000

Customer Benefits Summary

- Lower overall cost to Utilities Kingston results in more dollars available for infrastructure renewal.
- More efficient projects are better for the community as the disruption of a major construction project can be completed in a reduced time frame with the Utilities Kingston model.

Full Description

Construction in Ontario must adhere to Ontario Ministry of Labour regulations. The notice of project process establishes responsibility for the health and safety of workers on a construction site. This is typically handled by the main contractor having any worker coming on site pass through a health and safety training session. Further, to ensure safety there is a space and time separation that is kept between contracting forces.

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Utilities Kingston

Multi-Utility Model Benefits

Title: 10 – In Office Engineering Expertise

Financial Benefits Summary

Item/Description	Labour				Total
Cost to Kingston Hydro	$ 4,789	$ -	$ -	$ -	$ 4,789
Cost to Kingston Hydro if separate	$ 11,775	$ -	$ -	$ -	$ 11,775
Savings to Kingston Hydro	**$ 6,986**	**$ -**	**$ -**	**$ -**	**$ 6,986**

Financial Details (Provide calculations and assumptions used)

See "10 – In office Engineering Expertise.xlsx"

- Assume Electric engineer asking Civil Engineer for advice on concrete slab design, engineering technologist prepares drawing.
- Assume Engineer rate is $50/hr, benefits are 47%, loaded rate is $72.50
- Technologist rate is $35.09/hr, benefits are 47%, loaded rate is $50.88
- Assume Consultant Engineer is $100/hr
- Assume Consultant draftsperson is $60/hr
- Utilities Kingston Model;
  - Assume electrical Engineer spends 1 hour reviewing with civil Engineer
  - Assume civil Engineer spends 2 hours reviewing with electrical engineer and preparing design
  - Assume engineering technologist spends 2 hours preparing a drawing
- If Separate Model;
  - Assume electrical Engineer spends 2 hours preparing package for consultant, and reviewing results.
  - Assume consultant Engineer spends 4 hours processing request and completing design
  - Assume consultant draftsperson spends 2 hours to prepare a drawing
- Assume this happens on average 15 times per year for Kingston Hydro. (Similar for each of the other utilities as well.

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Utilities Kingston

Multi-Utility Model Benefits

Title: 11 – Fleet Savings: Spare Aerial (Bucket) Truck

Financial Benefits Summary

Item/Description	Hours Rented	Rental of Aerial Truck Actuals 2013	Total
Cost (Revenue) to Kingston Hydro	1,132	$ (18,112)	$ (18,112)
Cost to Kingston Hydro if separate		$ -	$ -
Savings to Kingston Hydro		**$ 18,112**	**$ 18,112**

Financial Details (Provide calculations and assumptions used)

Streetlights & Traffic Signals department has a large bucket truck (streetlight use) and a small bucket truck (traffic signals use). As in any fleet, trucks can be out of commission due to breakdowns, repairs and routine maintenance. When this occurs, reserve or spare units are pulled in for use or a truck is leased. Streetlights & Traffic Signals do not have any spare or reserve units, but are able to rent the Hydro group's spare aerial bucket truck (#38) at a cost of $16/hr. Cost to rent/lease a bucket truck is $3,700/mo ($44,400/yr), (quote obtained by G. Wimmer). Cost to purchase an aerial truck of this type would be approximately $300,000 (single bucket truck purchase by Kingston Hydro in 2011 was $292,000). For the year 2013, a total of 180.5 operating hours was used at a cost of $2,888. The vehicle was also used for capital work (primarily for the LED streetlight upgrade project which started April 15, 2013) at a cost of $14,744. From April 15, 2013 – May 12, 2014 the LED project was charged $21,272 or annually $19,807.

SUM OF TOTAL_VEHICLE_CHARGES 2013	
CALL_CODE	Total
E32	$ 32
E41 (Capital Traffic Signals)	$ 512
E42 (Capital LED Streetlight Project)	$ 14,232
E85 (Operating - Streetlights)	$ 1,224
E86 (Operating – Traffic Signals)	$ 1,160
E87 (Operating – Banner Hanging)	$ 80
E92 (Operating – Streetlights Damage)	$ 128
E96 (Operating - Parking Lot Lights)	$ 264
E99 (Operating - Park Lights)	$ 32
P82 (Capital)	$ 64
P83 (Capital)	$ 256
Grand Total	**$ 17,984**

SUM OF TOTAL_VEHICLE_CHARGES 2014 (TO MAY 12)	
CALL_CODE	Total
E41 (Capital Traffic Signals)	$ 352
E42 (Capital LED Streetlight Project)	$ 7,040
E84 (Competitive Work)	$ 64
E85 (Operating - Streetlights)	$ 152
E86 (Operating – Traffic Signals)	$ 72
Grand Total	**$ 7,680**

Kingston Hydro gains from this arrangement as it has received $17,984 in rent from an asset that is kept for spare use. Annually, it would equate to $23,559 (17984-14232+19807; using $19,807 instead of $14,232 above). Streetlight & Traffic Signals gains from not having to purchase a vehicle for spare use or leasing one, saving $20,841 (44,400-23559) in leasing costs.

Total vehicle was used for 1,132 hrs by municipal utilities= $18,112 cost for 2013

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Customer Benefits Summary

Lower costs to the utility results in lower costs to the ratepayers.

Utilities
Kingston

Multi-Utility Model Benefits

Title: 12 – Fleet Savings: RBD Truck

Financial Benefits Summary

Item/Description	Hours Rented	Rental of RBDTruck Actuals 2013	Total
Cost (Revenue) to Kingston Hydro	216	$ (3,456)	$ (3,456)
Cost to Kingston Hydro if separate		$ -	$ -
Savings to Kingston Hydro		**$ 3,456**	**$ 3,456**

Financial Details (Provide calculations and assumptions used)

Streetlights & Traffic Signals do not have a radial boom derrick (RBD) truck but are able to use the Hydro group's RBD at a rate of $16/hr. In 2013, it was used for a total of 208 hours (38 separate days; reference "RBD 109 069.xls") at a cost of $3,328. Cost of an RBD is $275,000 (May 12, 2014 email B. Steele). Rental rate is $5,750/mo, 2,300/wk, $575/day.

Kingston Hydro gains from this arrangement as it has received $3,456 in rent. Since this equipment is necessary to install poles, Streetlight & Traffic Signals needs to have one available at all times to deal with vehicle accidents where poles have been hit, so rentals would be difficult to manage. However, if we were able to get one on short notice for a day, the leasing cost at 38 days of usage would be $21,850 (38x$575). Leasing for the year would be $69,000.

Note: this is only relating to the cost of renting the truck, internal labour not included as the department renting used their own staff to operate the truck. Does not incorporate full maintenance or capital costs. Truck was rented internally by the hour. With third party we would have to rent by the day minimum.

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Utilities Kingston

Multi-Utility Model Benefits

Title: 13 – Fleet Savings: Dump Trucks & Backhoes

Financial Benefits Summary

Item/Description	Hours Rented Dump Truck	Rental of Dump Trucks Actuals 2013	Operating Cost if Purchased Dump Truck	Hours Rented Backhoe	Rental of Backhoes Actuals 2013	Operating Cost if Purchased Backhoe
Cost (Revenue) to Kingston Hydro	10	$ 304		90.5	$ 2,738	
Cost to Kingston Hydro if separate	10	$ 700	$ 20,020	91	$ 4,095	$ 20,022
Savings to Kingston Hydro		**$ 396**	**$ 20,020**		**$ 1,357**	**$ 20,022**

Financial Details (Provide calculations and assumptions used)

From "Dump Truck and Backhoe calculation from Bud Steele.pdf" and "Dump Truck and Backhoe costing.msg", "Backhoe and Dumptruck 2013 & 2014 actuals.xlsx"

Dump Truck

Actual Cost: 10 hours @ $30.40/hr = $304

Annual Operating Cost if Purchased (based on 10 yr amortization and 2% inflation)
- Capital portion = $14,358
- Parts = $2,122
- Labour = $1,374
- Fuel = $1,700
- Insurance = $466
- Total = $20,020

Backhoe

Actual Cost: 90.5 hrs @ $30.25 = $2,738

Annual Operating Cost if Purchased (based on 10 yr amortization and 2% inflation)
- Capital portion = $11,473
- Parts = $2,819
- Labour = $806
- Fuel = $4,700
- Insurance = $224
- Total = $20,022

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Full Description

The Hydro group uses the Water/Wastewater Underground group's dump trucks and backhoes routinely through the year for clearing snow around job locations, and loading and hauling aggregates, soil, etc. Both are charged at $31.31/hr (2014 rate).

If the departments were separate, then they would require to purchase or rent a backhoe and dump truck. Rental isn't really a viable option due to both cost (high usage every month) and convenience (in most cases there would be very little notice).

Utilities
Kingston

Multi-Utility Model Benefits

Title: 14 – Fleet Savings: Use of Loader Crane Truck

Financial Benefits Summary

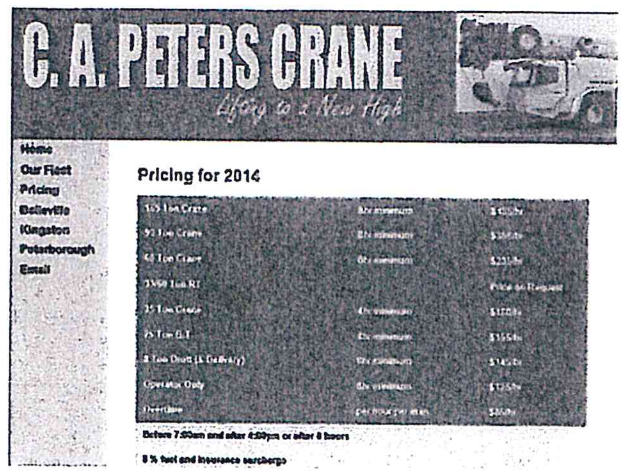
Item/Description	Hours Rented	Rental of Loader Crane	Total
Cost to Kingston Hydro	38	$ 1,190	$ 1,190
Cost to Kingston Hydro if separate	208	$ 34,819	$ 34,819
Savings to Kingston Hydro		**$ 33,629**	**$ 33,629**

Financial Details (Provide calculations and assumptions used)

From "Hiab Crane.xlsx"

Cost to rent a loader crane truck (C.A. Peters 2014 rates): $167.40 x 8 X 26 =$34,819.2
Actual Cost for use of Utilities Kingston loader crane $31.31/hr x 38hrs= $1,190

Customer Benefits Summary



Full Description

Utilities Kingston Hydro Group are able to use Water/Wastewater Underground Group's articulating loader crane (Hiab) truck for lifting heavy items such as transformers. Most distributors would not have this heavy lifting capability and would rent a crane, just as we would if we could not use our Underground Group's truck. Rental of a crane (from C.A. Peters Crane) for this costs $167.40/hr ($155x8%surcharge) and would be for the day (8 hours; load on and load off). During the time period analyzed the vehicle was used on 26 different days.

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Utilities Kingston

Multi-Utility Model Benefits

Title: 15 – Fleet Savings: Mechanical Repair Garage

Financial Benefits Summary

Item/Description		Labour		Supplies		Services				Total
Cost to Kingston Hydro	$	42,041	$	197,254	$	7,155	$	-	$	246,450
Cost to Kingston Hydro if separate	$	84,440	$	226,842	$	13,187	$	-	$	324,469
Savings to Kingston Hydro	**$**	**42,399**	**$**	**29,588**	**$**	**6,032**	**$**	**-**	**$**	**78,019**

Financial Details (Provide calculations and assumptions used)

(From "Fleet - Mechanical Division Costs.pdf" and Bud Steele, Manager of Fleet, City of Kingston)
2013 Operating Costs

Electric
Labour = $42,041
Supplies/Materials = $197,254
Contracted Services = $7,155
Total = $246,450

Utilities Kingston
Labour = $168,880
Supplies/Materials = $583,027
Contracted Services = $26,373 (76,405-50,032 insurance)
Total = $778,280

2013 Estimated Operating Costs if separate
Each utility would require a mechanical repair garage, with similar tools and equipment. Space in total for each garage would be approximately 50% of the existing size of the current garage. This would mean that contracted services – which is largely based on the size and equipment – would be 50% of the total contracted services cost. The Electric, Water and Wastewater utilities would require 1 mechanic each @$84,440 each (actual cost $160,880 / 2). Gas would require ½ FTE.
Due to less purchasing power, costs for supplies/materials would be a minimum of 15% higher.

Electric
Labour Cost = 1 x $84,440 = $84,440
Supplies/Materials = 1.15 x $197,254 = $226,842
Contracted Services = $26,373 / 2 = $13,187
Total = $324,469

Utilities Kingston
Labour Cost = 3.5 x $84,440 = $295,540
Supplies/Materials = 1.15 x $583,027 = $670,481
Contracted Services = $26,373 / 2 x 4 = $52,746
Total = $1,018,767

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Customer Benefits Summary

Full Description

We pay the City of Kingston to run one mechanical repair garage and two mechanics for Utilities Kingston. They maintain and repair over 150 Utilities Kingston vehicles and trailers. Other utilities would have at least 1 mechanic and repair facility, or would contract the work out, so our model provides significant savings compared to that if the utilities were separate entities. We also gain as the purchasing pool (for parts, tires, fuel, etc.) is that much larger as it is incorporated with the entire City of Kingston's fleet. Also, we gain additional discounts on purchase of new vehicles as well. The City is also able to provide labour backup to the mechanics (case in point, right now one of our two mechanics is off for a few weeks due to illness, and the City was able to drop another mechanic in to fill in without any service disruption).

Utilities Kingston

Multi-Utility Model Benefits

Title: 19-21 – Shared Warehouse and Storage Yard

Financial Benefits Summary

Item/Description	Warehouse		Forklifts		Total
Cost to Kingston Hydro	$ 25,533		$ 13,000	$ -	$ 38,533
Cost to Kingston Hydro if separate	$ 80,730		$ 30,000	$ -	$ 110,730
Savings to Kingston Hydro	**$ 55,197**	**$ -**	**$ 17,000**	**$ -**	**$ 72,197**

Financial Details (Provide calculations and assumptions used)

Warehouse storage space ranges from $7 to $21 (lease + additional operating) but our location and loading dock plus warehouse racking and height make it reasonable to calculate using $15. A search on the internet reveals $1.35 per square yard for outside storage.

Currently, Utilities Kingston has 2 forklifts, one inside and one outside. Forklift replacement cost would be 20k for the inside lift and 30k outside.

Percentage used for calculations are 26% Electric 14% Gas 30% Water 30% Sewer.

Percentage that Electric pays today in our current model is 26%, however, if the Electric was separate they represent 60 percent of the current space, therefore, that number is used when calculating cost if separate.

Actual cost is 7800 sq ft x 12.59 per sf.
If we were separate, needs/costs would be the following, which includes a 15% increase of current size to allow for the extra swing space that would be needed and due to the smaller size, a rate of $15/sq.ft..
Electric: 60% x 7800 x 1.15 = 5,382 sq.ft. x $15 = $80,730
Gas: 20% x 7800 x 1.15 = 1,794 sq.ft. x $15 = $26,910
Water: 10% x 7800 x 1.15 = 897 sq.ft. x $15 = $13,455
Sewer: 10% x 7800 x 1.15 = 897 sq.ft. x $15 = $13,455
Total Cost = $134,550

Each utility could get by with one outside forklift to handle both areas and therefore the cost for separate utilities would be $30,000 x 4.

Customer Benefits Summary

A warehouse is sized based on the routine expectation of space requirement plus a 'safety' margin to allow for the typical peaks that occur. In a single utility model, this extra swing space would be underutilized most of the time. With our multiple utilities, since it is not often that the peaks for each utility group occur simultaneously (and where it might, we can adjust the timing), we do not have to size our warehouse space based on the total sum of each utility's swing space if they were separate.

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Utilities Kingston

Multi-Utility Model Benefits

Title: 22 – Staff - Health & Safety

Financial Benefits Summary

Item/Description	Labour & Benefits	Computers & Phones			Total
Cost to Kingston Hydro	$ 40,144	$ 949	$ -	$ -	$ 41,093
Cost to Kingston Hydro if separate	$ 91,500	$ 2,750	$ -	$ -	$ 94,250
Savings to Kingston Hydro	**$ 51,356**	**$ 1,801**	**$ -**	**$ -**	**$ 53,157**

Financial Details (Provide calculations and assumptions used)

Used 2014 budgeted amounts total salaries and benefits = $134,777 (1.5 FTE)

Allocation to electric 23%

Assumption 1 Health and Safety professional for <u>smaller</u> organization $75,000 + 22 % benefits = $91,500
If separate would require 1 FTE for electric, water and wastewater, gas may not be large enough to support a dedicated employee assume .5 FTE along with other duties – 3.5 * 91,500

Computer and telephones cell, landline, laptops = $2750/ FTE

Office space allocation accounted for in rent calculation

Customer Benefits Summary

- Enables some capacity for public education, school programming etc.

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Multi-Utility Model Benefits

Title: 37 – Staff: Meter Shop Resources

Financial Benefits Summary

Item/Description	Labour				Total
Cost to Kingston Hydro	$ 409,153	$ -	$ -	$ -	$ 409,153
Cost to Kingston Hydro if separate	$ 589,569	$ -	$ -	$ -	$ 589,569
Savings to Kingston Hydro		$ -	$ -	$ -	$ 180,416

Financial Details (Provide calculations and assumptions used)

- Used Budget Values from Mar Operating Manager Report
  - 710100, 710115, 710200, 720210, 720280 from 71610
  - 710100, 710115, 710200, 720220 from 71650
  - 710100, 710200, 710115, 720210, 720220 from 71651
  - 710100 from 71652
  - 710100, 710115, 720210, 720220 from 71653
- KHC under Current Model is 23% of 71610 costs, plus electric only programs (71651, 71652, 71653), plus share of manager costs (25% of 40% of total manager cost)
- Muni Share under Current model is 77% of 71610 and 100% 71650, plus share of manager costs (75% of 40% of total manager cost)
- If KHC was alone then expect 57% of 71610 and 71650 (Representing 4 staff ... 3 journeymen and 1 clerk) plus the electric only programs (71651, 71652, 71653). ½ FTE for manager.
- If UK was alone then 71% of 71610 and 71650 (Representing 5 staff, 4 journeymen and 1 clerk), 1/2 FTE for manager.
- Not taking into account information system benefits
- Manager is currently allocated 40% to Meter Shop, 40% to SCADA, 20% to Fibre/Networking.
- Meter Shop portion of Manager cost is allocated 25% each to Electric, Water, Waste Water, Gas.

Customer Benefits Summary

- The electric utility experiences a lower operating cost than if separate from the multi-utility model. This translates into rates which are lower than would be expected with a stand alone LDC.
- The water and gas utilities experience a lower operating cost than if separate from the electric utility. This translates into rates which are lower than would be expected without the multi-utility model.
- The meter shop is able to experience more than one meter manufacturer and technology. This provides an opportunity to evaluate vendors/technologies in a real world environment. If the utilities were separate this kind of exposure would be obtained through consultant experience or soliciting feedback from colleagues in industry.

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- Unified processes are used across the utilities. This translates into a consistent experience for the end customer.
- During meter replacement programs the number of "truck rolls" is reduced as Utilities Kingston resources have the ability to change water, gas, and electric meters. This is currently true for large water and gas meter replacement programs.

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Multi-Utility Model Benefits

Title: 41 – Executive Team

Financial Benefits Summary

Item/Description				Total
Cost to Kingston Hydro	$ 237,022	$ -	$ -	$ -	$ 237,022
Cost to Kingston Hydro if separate	$ 629,720	$ -	$ -	$ -	$ 629,720
Savings to Kingston Hydro	**$ 392,698**	**$ -**	**$ -**	**$ -**	**$ 392,698**

Financial Details (Provide calculations and assumptions used)

Currently:
CEO
CFO
VP (Director of Gas Operations)
Director of Engineering
Director of Hydro and Business Services
Director of Water and Waste Water

<u>If separate for Hydro:</u>
(assuming 30% for Payroll Benefits)
CEO
CFO
VP- Operations
VP- Engineering

<u>If separate for Water, Waste Water and Gas:</u>
(Assume City of Kingston retains ownership and management of Water & Waste Water)
(Assuming 30% for Payroll Benefits)
CEO, CFO, VP- Engineering, VP- Operations
Director of Water and Waste Water

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Utilities Kingston

Multi-Utility Model Benefits

Title: 42 – Service Advisors & Clerk

Financial Benefits Summary

Item/Description	Labour/Ben				Total
Cost to Kingston Hydro	$ 3,408	$ -	$ -	$ -	$ 3,408
Cost to Kingston Hydro if separate	$ 54,000	$ -	$ -	$ -	$ 54,000
Savings to Kingston Hydro	**$ 50,592**	**$ -**	**$ -**	**$ -**	**$ 50,592**

Financial Details (Provide calculations and assumptions used)

Based on Budget for 2014 we have 4 FTE Service Advisors (1 vacancy currently) that amount to approximately $284,000 including benefits, and 1 FTE Clerk that amounts to $76,000 including benefits.

The Service Advisors are Split between 3 different areas:

- Appliance Rental Business 38% $10,920
- Customer Service 12%, $ $34,000
    - Electric 10%, $3,400
    - Gas 50%, $17,000
    - Water 25%, $8,500
    - Sewer 15%, $5,100
- Capital 50%, $142,000
    - Gas 42%, $59,640
    - Water & Sewer 58%, $82,360

The Clerk's budget is to 2 different areas:

- Appliance Rental 60%, $ $45,600
- Customer Service 40%, $30,400
    - Electric 42%, $12,844
    - Gas 13%, $3,876
    - Water 23% $6,840
    - Sewer 23% $6,840

For 2014, one FT Service Advisor or Clerk Labour/Benefits = $72,000

Using 2014 Budget with the 4 Service Advisors allocated 14.5% to Customer Service (program 74120:
Allocation to Electric = $3,400
Allocation to other utilities = $30,600 (17,000+8,500+5,100)
Total Labour/Benefits = $34,000

If separate, each of Electric, Gas, Water, Sewer, would require at least 1 FTE. At least, because providing coverage for periods of vacation and sickness could warrant an additional employee (part-time or full-time). However, the demands on that employee could be such that at times there is other work that they could do, so conservatively assume a 75% allocation to this function. With 75% of 1 FTE, the labour/benefits costs would be $54,000 (75% x $72,000 (2014 labour/benefit cost for 1 UK Service Advisor)). So with 3 utility companies, the cost to the customer would be $162,000.

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Customer Benefits Summary

Each of the Service Advisors deal with all utility services, so benefits are that the customer has 'one-stop shopping'; they speak to just one employee:

- Get advice about all the utilities in one conversation. Faster turn-around times saving the customer time (and money) with not having to call multiple companies and deal with different forms and requirements.
- All utility service connections and work then are arranged in a coordinated fashion.

Full Description

We have 4 Service Advisors that act as the single point of contact for issues that are more complex than what the Customer Service Representative call-takers handle. Primarily, they deal with new utility service connections, upgrades, demolitions and other issues. Each of them are able to deal with all of our utilities and also serve to provide the link between the customer and the technical and trades staff. Other utility companies have similar positions with these functions, but with our multi-utility model, we are able to provide proper coverage with 4 FTE's who can cover for one another and who also work on other programs (other than 74120).

Utilities Kingston

Multi-Utility Model Benefits

Title: 45 – Customer Service: Cost of Specialized Equipment

Financial Benefits Summary

Item/Description	Software Implementation Cost				Total
Cost to Kingston Hydro	$ 17,695	$ -	$ -	$ -	$ 17,695
Cost to Kingston Hydro if separate	$ 77,746	$ -	$ -	$ -	$ 77,746
Savings to Kingston Hydro	**$ 60,051**	**$ -**	**$ -**	**$ -**	**$ 60,051**

Financial Details (Provide calculations and assumptions used)

- Total software cost at time of implementation $77,745.69 (See DBC.xls)
  - Electric Share = $17,694.63
  - Gas Share = $13,078.63
  - Waste Water Share = $23,486.21
  - Water Share = $23,486.21
- Assumed that if each Utility were to implement their own call recording system, they would do so with the same tool Utilities Kingston implemented (Oaisys).

Customer Benefits Summary

- Customer is ensured that what they say to a customer service rep is on record.
- Staff training occurs on the job, with real life examples/situations.

Full Description

Utilities Kingston is able to leverage the utilities it manages into getting more value from purchases than if the utilities were separate.

As an example, occasionally there are changes to the environment that Utilities Kingston operates in with respect to customer service. Utilities Kingston decided to proceed with deploying call-recording technology across all the utilities it manages. The decision to apply this to all businesses was a result of an internal review associated with risk mitigation, as well as professional development for those staff that work with customers directly.

Recording customer phone calls provides support for decisions made and information exchanged between customer service representatives and customers. This helps ensure customers are heard and their wishes are implemented to the best of Utilities Kingston's abilities. Recording calls also allows the CSR supervisor to listen to calls for training opportunities which is valuable professional development.

Further, Utilities Kingston has deployed this technology to its credit and collections department. The previously mentioned reasons for doing so are still true in this scenario, but there is also the added benefit of safety. Credit and Collections staff occasionally deal with customers going through hard times and may lose their temper with staff. In these situations the recording of a phone call can protect the employee and the customer from being misinterpreted.

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Utilities
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Multi-Utility Model Benefits

Title: 50 – Staff: SCADA Resources

Financial Benefits Summary

Item/Description	Labour				Total
Cost to Kingston Hydro	$ 66,843	$ -	$ -	$ -	$ 66,843
Cost to Kingston Hydro if separate	$ 185,953	$ -	$ -	$ -	$ 185,953
Savings to Kingston Hydro	$ 119,110	$ -	$ -	$ -	$ 119,110

Financial Details (Provide calculations and assumptions used)

- Used Budget Values from Mar Operating Manager Report
    - 710100, 710200, 720210, 720220, 720280 from Program 71340
- KHC under Current Model is 23% of 71340, plus manager cost (25% of 40% of total manger cost).
- Muni Share under Current model is 77% of 71340, plus manager cost (75% of 40% of total manager cost)
- If KHC was alone then expect 56.25% of 71340 (Representing 2.25 staff ... 2 journeymen and .25 clerk), ½ FTE for manager.
- If UK was alone then 81% of 71340 (Representing 3.25 staff, 3 journeymen and .25 clerk), 1/2 FTE for manager.
- Not taking into account information system benefits
- Not taking into account vehicle benefits
- Manager is currently allocated to 40% Meter Shop, 40% SCADA, 20% Fibre/Networking
- SCADA portion of Manager cost currently is allocated 25% each to Electric, Water, Waste Water, Gas.

Customer Benefits Summary

- The electric utility experiences a lower operating cost than if separate from the multi-utility model. This translates into rates which are lower than would be expected with a stand alone LDC.
- The water and gas utilities experience a lower operating cost than if separate from the electric utility. This translates into rates which are lower than would be expected without the multi-utility model.
- The SCADA group is able to experience more than one meter manufacturer and technology. This provides an opportunity to evaluate vendors/technologies in a real world environment. If the utilities were separate this kind of exposure would be obtained through consultant experience or soliciting feedback from colleagues in industry.
- The multi-utility model provides a staff level that can support on-call staff. This means that staff are available in the event of an emergency outside of normal working hours. The customer benefits from this through quicker restoration times in the event of a system disruption, as well as fewer disruptions.

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Multi-Utility Model Benefits

Title: 53 – Human Resources- Staff

Financial Benefits Summary

Item/Description	FTE HR	Labour & Benefits	FTE Payroll	Payroll Processing	Computer & Phones	Total
Cost to Kingston Hydro	0.53	$ 50,232	Out Sourced	$ 20,072	$ 1,455	$ 71,759
Cost to Kingston Hydro if separate	1	$ 91,500	1	$ 67,100	$ 5,500	$ 164,100
Savings to Kingston Hydro		**$ 41,268**		**$ 47,028**	**$ 4,045**	**$ 92,341**

Financial Details (Provide calculations and assumptions used)

Used 2014 budgeted amounts total salaries and benefits = $218,400 (2.3 FTE)

Assumption 1 HR professional $75,000 + 22 % benefits = $91,500
Allocation to electric 23%
If separate would require 1 FTE for electric, water, wastewater, gas may not be large enough to support a dedicated employee assume .5 FTE along with other duties – 2.5 * 91,500

Payroll: Currently the City of Kingston processes Utilities Kingston payroll for us at a cost of $77,000 for 2014. The major components to payroll processing include, pay runs, T4 preparation, tax remittance, WSIB remittance & user system maintenance. If we were separate businesses and did this function in house it would require at least 1 FTE per business
Assumption 1 payroll clerk $55,000 + 22 % benefits = $67,100

Computer and telephones one cell, landline, laptops = $2750/FTE

Office space accounted for in rent calculations

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Utilities Kingston

Multi-Utility Model Benefits

Title: 55 – Communications

Financial Benefits Summary

Item/Description	Labour & Benefits	Computer & Phones			Total
Cost to Kingston Hydro	$ 23,872	$ 822	$ -	$ -	$ 24,694
Cost to Kingston Hydro if separate	$ 39,920	$ 1,375	$ -	$ -	$ 41,295
Savings to Kingston Hydro	**$ 16,048**	**$ 553**	**$ -**	**$ -**	**$ 16,601**

Estimated Total Annual OMA Savings: $57,813
Estimated Total Annual Capital Savings: $

Financial Details (Provide calculations and assumptions used)

Used 2014 budgeted amounts total salaries and benefits = $103,790 (1.3FTE)

Allocation to electric 23%

Assumption communication would be a part time activity

Computer and telephones cell, landline, laptops = $2750 per staff

Office space allocation accounted for in rent calculation

If separate would require Electric 0.5 FTE, Water 0.75 FTE, Sewer 0.5 FTE, Gas 0.25 FTE.

Customer Benefits Summary

- Customer receives integrated messaging that takes into consideration and coordinates the multiple utilities.

Full Description

Utilities Kingston has one full-time Communications Advisor that works and coordinates the various utilities messaging to the ratepayers.

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Multi-Utility Model Benefits

Title: 58 – Information Technology Costs

Financial Benefits Summary

Item/Description	Email	Enterprise GIS	ERP	Network	Other Applications	Telephony	Total
Cost to Kingston Hydro	$ 7,957	$ 115,218	$ 56,905	$ 35,771	$ 65,184	$ 35,645	$ 215,852
Cost to Kingston Hydro if	$ 10,127	$ 146,642	$ 72,425	$ 45,527	$ 82,961	$ 45,366	$ 403,047
Savings to Kingston Hydro	**$ 2,170**	**$ 31,423**	**$ 15,520**	**$ 9,756**	**$ 17,777**	**$ 9,721**	**$ 58,869**

Financial Details (Provide calculations and assumptions used)

- See "58 – IT Costs.xlsx", "IT Costs.pdf"
- Assume no profit margin in costs from City of Kingston
- Assume 2011 costs are based on 166 employees
- Assume 2014 costs are based on 220 employees
- Assume inflation at 2% per year (To inflate costs shown in IT Costs.pdf to 2014 values)
- Utilities Kingston Model;
  - Assume Email Costs $144.66 per employee
  - Assume Enterprise GIS Costs $2,094.88 per employee
  - Assume ERP costs $1,034.64 per employee
  - Assume Network costs $650.39 per employee
  - Assume Other Applications costs $1,185.16 per employee
  - Assume Telephony costs $648.09 per employee
  - Assume Each Utility is responsible for 25% of the total cost
- If Separate Model
  - Assume Electric and Gas Utilities would need services from a 3rd party provider
  - Assume Utilities Kingston per employee rates are at cost
  - Assume 40% profit margin for 3rd party provider
  - Assume Water and Waste Water Utilities would still be able to get IT services at cost from the municipality.
  - Assume per employee rates would be the same at Utilities Kingston costs, with profit added to electric and gas utilities.

	# of Employees	Email	Enterprise GIS	ERP	Network	Other Applications	Telephony	*Total*
Electric	50	$ 10,126.51	$ 146,641.55	$ 72,425.01	$ 45,527.06	$ 82,960.96	$45,366.15	*$403,047.25*
Water	70	$ 10,126.51	$ 146,641.55	$ 72,425.01	$ 45,527.06	$ 82,960.96	$45,366.15	*$403,047.25*
Waste Water	70	$ 10,126.51	$ 146,641.55	$ 72,425.01	$ 45,527.06	$ 82,960.96	$45,366.15	*$403,047.25*
Gas	30	$ 6,075.91	$ 87,984.93	$ 43,455.01	$ 27,316.24	$ 49,776.58	$27,219.69	*$241,828.35*

Customer Benefits Summary

- Lower information technology costs directly affect the operating costs of Utilities Kingston. Lower costs result in controlled rates to customers.

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Full Description

Utilities Kingston procures information technology services from the City of Kingston at cost. If these services were procured from a 3rd party vendor then it would be expected that the vendor have a profit margin on those costs.

Utilities Kingston

Multi-Utility Model Benefits

Title: 66-69 – FINANCE

Financial Benefits Summary

Item/Description	Postage	Cashiering	Finance & Regulatory	Total
Cost to Kingston Hydro	$ 135,123	$ 31,600	$ 1,082,917	$ 1,249,640
Cost to Kingston Hydro if separate	$ 156,000	$ 88,750	$ 1,484,389	$ 1,729,139
Savings to Kingston Hydro	**$ 20,877**	**$ 57,150**	**$ 401,472**	**$ 479,499**

Financial Details (Provide calculations and assumptions used)

See attached spreadsheet

Customer Benefits Summary

- Customer benefits on the billing side with one bill and 1 payment. One stamp. One cashier.

Full Description

Billing

Kingston Hydro shares in postage and mailing costs with 3 other utilities. Postage expenses would increase as the full cost per mailing would no longer be shared with other utilities.

Paper/Printing costs would triple (Hydro Bill, Gas Bill, Water Bill, Sewer Bill)

Credit

Currently Kingston Hydro pays a portion of cashiering and clerical costs with the other utilities. If separate, Kingston Hydro would require 1 clerical person to handle payment processing.

Regulatory

Currently 1 regulatory/rates analyst – if separate Kingston Hydro would need a full time regulatory analyst.

Administration

Currently share 1 CFO, 1 Manager, 1 financial analyst, 2 accountants and 2 clerks - if Kingston Hydro were separate we would need at least 1 Manager, 1 accountant and 1 clerk.

Rent, municipal taxes and other shared services are shared costs with Kingston Hydro.

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Interrogatory 1-SEC-6

[Ex.1-5-1, Attach. 2] The 2022 Customer Engagement Presentation slide 19 (2023 Distribution Rate Change – Estimated Bill Impacts) shows a 6.0% change for GS > 50 kW class, and slide 20 (2023 Total Bill Impacts – Distribution Rate Charge) shows a 0.4% change for the same class. The updated Bill Impact Model shows 8.23% and 1.28% for the same changes. What changed between the presentation and the application to increase the impact?

Response

The main reason for the bill impact increase was the inclusion of deferral and variance rate riders (DVAs) in the application. The introduction of DVAs resulted in bill impacts that required rate mitigation for the Street Lighting class. A consequence of rate mitigation was higher-than-average rate increases for the GS > 50 kW class, as this was the class with the lowest R/C ratio. Rate mitigation is no longer necessary following the update to the allocation of rate riders described in 9-Staff-80 so the GS > 50 kW class no longer receives this portion of the rate increase. The GS > 50 kW distribution bill impact has lowered to 6.10% and the total bill impact is 1.10%.

Interrogatory 1-SEC-7

[Ex.1-6-1, pp. 10 & 15] Kingston Hydro states that it has revised its pole count and pole additions for 2018, 2019 and 2020 as follows:

	Pole Count original	Calculated additions	Stated additions	Pole Count revised	Calculated additions	Stated additions
2018	3,500	N/A	124	4,940	N/A	162
2019	3,500	0	67	5,007	67	74
2020	5,000	1,500	41	5,048	41	61

Please explain the discrepancies between the calculated versus stated additions for both the original and revised numbers.

Response

Pole Count:

At the time the original request for total pole count data was received by Kingston Hydro in late 2020, Kingston Hydro was unable to respond with information due to problems with our GIS Pole Asset Registry data in our GIS system. As a result, we are unable to confirm the source of the subsequent numbers when the draft APB survey data (Mar. 2021) was released. By March of 2022 the GIS Pole Asset Registry data was corrected and validated and the revised numbers were provided and included in the DSP.

Pole Additions:

Similar to the above comments related to total pole count initial pole additions were unavailable. In addition, it was discovered that some “pole additions” were incorrectly attributed as pole replacements in our GIS pole asset Registry. This error was identified as part of the APB review process and corrected with the updated information.

Interrogatory 1-SEC-8

[Ex.1-3-11, p. 2] Please provide a copy of the METSCO Report referred to in this application, which was prepared in response to the settlement agreement direction '…to develop meaningful metrics/targets and to define outcome reporting'.

Response

Please refer to the response to 1-Staff-3.

ADMINISTRATION (EXHIBIT 1)

Interrogatory 1.0-VECC-1

Reference: Exhibit 1, Tab 6, Schedule 1

a) Please provide the KHC Scorecard which includes the 2021 results.

Response

a) Attached is Kingston's 2021 Scorecard.

Response to Vulnerable Energy Consumers Coalition (VECC)

Interrogatory #1.0-VECC-1

Attachment 1 of 1

(Scorecard – Kingston Hydro Corporation)

Scorecard - Kingston Hydro Corporation

9/1/2022

Performance Outcomes	Performance Categories	Measures		2017	2018	2019	2020	2021	Trend	Target: Industry	Target: Distributor
Customer Focus Services are provided in a manner that responds to identified customer preferences.	**Service Quality**	New Residential/Small Business Services Connected on Time		100.00%	100.00%	100.00%	100.00%	100.00%		90.00%	
		Scheduled Appointments Met On Time		100.00%	98.68%	99.73%	99.52%	99.59%		90.00%	
		Telephone Calls Answered On Time		68.76%	60.78%	64.63%	64.65%	77.43%		65.00%	
	Customer Satisfaction	First Contact Resolution		98.84%	98.96%	99.18%	99.06%	98.68%			
		Billing Accuracy		97.09%	99.71%	92.04%	99.57%	95.81%		98.00%	
		Customer Satisfaction Survey Results		'A'	'A'	'A'	'A'	"A"			
Operational Effectiveness Continuous improvement in productivity and cost performance is achieved; and distributors deliver on system reliability and quality objectives.	**Safety**	Level of Public Awareness		79.00%	80.00%	79.00%	82.00%	82.00%			
		Level of Compliance with Ontario Regulation 22/04 [1]		C	C	C	C	C			C
		Serious Electrical Incident Index	Number of General Public Incidents	1	0	0	0	0			0
			Rate per 10, 100, 1000 km of line	0.000	0.000	0.000	0.000	0.000			0.042
	System Reliability	Average Number of Hours that Power to a Customer is Interrupted [2]		1.40	1.50	0.88	1.57	1.41			1.33
		Average Number of Times that Power to a Customer is Interrupted [2]		1.07	1.00	0.73	0.87	2.10			0.85
	Asset Management	Distribution System Plan Implementation Progress		on track	On track	Trending Up	On track	On track			
	Cost Control	Efficiency Assessment		3	3	3	3	3			
		Total Cost per Customer [3]		$538	$583	$574	$562	$543			
		Total Cost per Km of Line [3]		$44,400	$48,238	$47,559	$46,486	$45,552			
Public Policy Responsiveness Distributors deliver on obligations mandated by government (e.g., in legislation and in regulatory requirements imposed further to Ministerial directives to the Board).	**Connection of Renewable Generation**	Renewable Generation Connection Impact Assessments Completed On Time [4]									
		New Micro-embedded Generation Facilities Connected On Time		100.00%	100.00%	100.00%	100.00%	100.00%		90.00%	
Financial Performance Financial viability is maintained; and savings from operational effectiveness are sustainable.	**Financial Ratios**	Liquidity: Current Ratio (Current Assets/Current Liabilities)		1.84	1.57	1.47	1.69	1.69			
		Leverage: Total Debt (includes short-term and long-term debt) to Equity Ratio		1.41	1.10	1.11	1.12	1.10			
		Profitability: Regulatory Return on Equity	Deemed (included in rates)	9.19%	9.19%	9.19%	9.19%	9.19%			
			Achieved	7.82%	7.48%	9.50%	7.25%	8.39%			

1. Compliance with Ontario Regulation 22/04 assessed: Compliant (C); Needs Improvement (NI); or Non-Compliant (NC).
2. An upward arrow indicates decreasing reliability while downward indicates improving reliability.
3. A benchmarking analysis determines the total cost figures from the distributor 's reported information.
4. Value displayed for 2021 reflects data from the first quarter, as the filing requirement was subsequently removed from the Reporting and Record-keeping Requirements (RRR).

Legend:

5-year trend: up, down, flat

Current year: target met, target not met

2021 Scorecard Management Discussion and Analysis ("2021 Scorecard MD&A")

The link below provides a document titled "Scorecard - Performance Measure Descriptions" that has the technical definition, plain language description and how the measure may be compared for each of the Scorecard's measures in the 2021 Scorecard MD&A:
http://www.ontarioenergyboard.ca/OEB/_Documents/scorecard/Scorecard_Performance_Measure_Descriptions.pdf

Scorecard MD&A - General Overview

Kingston Hydro presents its scorecard for the year 2021. The scorecard measures how well Ontario's electricity distributors are performing each year, with respect to customer focus, operational effectiveness, public policy responsiveness, and financial performance.

Utilities Kingston manages, operates and maintains the assets of Kingston Hydro Corporation, along with municipal water, wastewater and gas utilities. This unique multi-utility model is a major contributor to Kingston Hydro's strengths in customer service, safety, and financial and operating efficiency.

From our award-winning safety programs to high customer satisfaction scores, Utilities Kingston maintains a strong reputation in meeting or exceeding regulatory requirements, responsiveness to community needs, reliable customer service and cost-saving efficiencies. In 2021, Kingston Hydro continued to perform strongly against the performance targets for the measures set out by the Ontario Energy Board (OEB).

The results of the 2021 customer satisfaction survey are in, and we're proud that we have maintained our overall customer satisfaction score of 'A'. Highlights:

- Customer satisfaction – 96 per cent (Ontario benchmark 93 per cent)
- Provides reliable electricity – 95 per cent (Ontario benchmark 90 per cent)
- Quickly restores power – 91 per cent (Ontario benchmark 87 per cent)
- Adapts well to customer expectations – 87 per cent (Ontario benchmark 83 per cent)

- Keeps its promises to its customers and community – 82 per cent (Ontario benchmark 76 per cent)

Recognized in the industry for our safety leadership, health and safety continues to be an important focus for our organization. Our health and safety management system reduces accidents and injuries, ensures safe work environments, educates the public about electrical safety and promotes a culture of safety. Kingston Hydro performed well against the targets under the Safety category. In 2021, we introduced our mandatory online e-Learning Safety Days program, preparing contractors for a safe construction season.

Our team continues to demonstrate its commitment to customer focus. From offering flexible payment plans to supporting government programs and priorities, our team worked hard to offer pandemic relief and work with our customers who were most impacted by the economic downturn. We are especially proud of the progress made on the service quality metric *Telephone Calls Answered On Time.* Working closely with our contact centre, we implemented operational improvements and are now exceeding the industry target for this metric.

One area of improvement falls under the *Customer Focus* performance outcome: billing accuracy. In 2021, we did not meet the industry target for this measure. Yet, we understand the importance to customers of receiving accurate bills that provide the right information, the first time. This measure was impacted by two issues, brought about when a new rate was created. The issues were subsequently reviewed and resolved. We have enhanced the review of rate implementation, to help prevent similar issues from occurring in the future.

System reliability is also a key focus for Utilities Kingston. We track all electricity outages and strive to reduce the length of time that they affect customers. In 2021, we did not meet our System Average Interruption Frequency Index (SAIFI) or System Average Interruption Duration Index (SAIDI) targets in the Safety performance category.

A 44 kV customer-owned equipment failure contributed 35.5 per cent of the annual SAIDI and 18.1 per cent of the annual SAIFI. Meanwhile, during a thunderstorm, a number of trips on multiple 44 kV feeders contributed 31 per cent of the annual SAIFI.

While, in 2021, a significant percentage of SAIFI and SAIDI were caused by circumstances beyond our control, Kingston Hydro recognizes the importance of system reliability, and will strive to improve these areas in the future. The utility remains focused on proactive tree trimming, preventative inspection, and infrastructure renewal programs.

In terms of cost control, we manage costs to ensure our customers receive value for the cost of the service. Kingston Hydro's total operating, maintenance and administrative expenses per customer for 2021 are significantly below provincial averages, and partly a reflection of the cost-saving economic benefits of scope through our unique multi-utility model.

One project, completed in 2021, that highlights our commitment to both system reliability and cost-saving efficiencies, is the upgrade of Municipal Substation No. 1 (MS1), which is now supplying power to Kingston's downtown core. This critical community investment will strengthen the vitality, growth and development of Kingston's downtown, university and hospital district for decades to come. The project was initiated in 2015 and was completed ahead of the anticipated completion in 2023. The upgrades were made almost entirely by Utilities Kingston's substation electricians, which resulted in cost savings for the project. Our staff completed design and engineering, electrical construction and installation, building work and replaced end-of-life electrical equipment within the substation, some of which had been in operation for over 65 years.

Utilities Kingston is committed to continually improve service to customers. On behalf of Kingston Hydro, we continue to monitor performance, with a focus on safe, reliable and efficient services. Our customers and community can count on us.

Service Quality

- **New Residential/Small Business Services Connected on Time**
  - Utilities must connect new service for the customer within five business days, 90 per cent of the time, unless the customer agrees to a later date. Kingston Hydro exceeded this target for the 328 new low voltage (less than 750 volts) services connected in 2021. As in previous years, 100 per cent of these services were connected within the target of five working days (from the time all required permits were issued).

- **Scheduled Appointments Met On Time**
  - For appointments during the utility's regular business hours, the utility must offer a window of time that is not more than four hours long, and must arrive within that window, 90 per cent of the time. Customers make appointments with Utilities Kingston, on behalf of Kingston Hydro, for a variety of reasons, including for meter changes, service upgrades, and utility locates. Utilities Kingston strives to complete all requested appointments within five business days, and understands that being on time is important to deliver reliable customer service. In 2021, 484 of 486 (99.59 per cent) of scheduled appointments were met on time, surpassing the target of 90 per cent and similar to the 2020 result.

- **Telephone Calls Answered On Time**
  - During regular call centre hours, the utility's call centre staff must answer phone calls within 30 seconds of receiving the call directly, or having the call transferred to them, 65 per cent of the time.
  - In 2021, customer service representatives answered a total of 48,328 calls, a reduction of 6.1 per cent from 2020 call volume.
  - 77.43 per cent of calls (37,420), an increase over 64.65 per cent in 2020, were answered within 30 seconds. We continue to focus efforts on improving this metric year over year.
  - Operational changes at our contact centre that were planned and delayed in 2019 and early 2020 were implemented in Q4 2020. These changes were made to improve our performance on Service Quality measures and those results are reflected in the improved results for telephone accessibility in 2021.
  - We have worked closely with our contact centre to make improvements and ensure that we are reaching and exceeding the service

level expectations going forward. The results for 2021 are a great improvement over our previously reported results.

Customer Satisfaction

- **First Contact Resolution**
  - Utilities should aim to address their customers' needs as quickly as possible. Ideally, their concerns and issues are resolved the first time the customer contacts the utility.
  - For Utilities Kingston, this is a measure of the number of times a customer inquiry/request, related to their account, is handled by the first person to receive the contact.
  - 98.68 per cent of contacts were answered without having to transfer to another staff member. First contact resolution is closely monitored to ensure that front line staff members have the information and tools available so they can effectively address customer inquiries.

- **Billing Accuracy**
  - An important part of business is ensuring that customer bills are accurate. An accurate bill provides customers the right information, the first time.
  - For 2021, Utilities Kingston issued 347,835 bills on behalf of Kingston Hydro Corporation, with an overall billing accuracy of 95.81 per cent, a decrease from 2020. This fell below the industry standard of 98 per cent of all bills being accurate.
  - Billing accuracy results were impacted by two issues identified and resolved, which resulted in bill adjustments during November and December for both a 24-bill timeframe and a three-bill timeframe:
    - An issue with a group of interval-metered customers that receive the one per cent primary metering allowance affected bill presentment kilowatt hours displayed, and an over-charge to commodity, only whereby the calculation did not apply the one per cent primary metering allowance.
    - The second issue was an incorrect global adjustment modifier price, affecting some non-Regulated Price Plan customers receiving this rate.

- **Customer Satisfaction Survey Results**
  - Utilities use different ways to determine how satisfied their customers are with the service they receive. Distributors are required to report their results every second year, at a minimum.
  - A customer satisfaction survey was conducted by UtilityPulse on behalf of Kingston Hydro from August 26 to October 5, 2021 and the results are based on telephone interviews with 400 customers (both residential and commercial).
  - An overall rating of 'A' was reported in 2021, consistent with the previous surveys conducted in 2014, 2016, and 2019.
  - Highlighted in the 2021 Customer Satisfaction Survey was an overall satisfaction rate of 96 per cent, supported by a 91 per cent rating for delivering on its service commitments to customers. The Utilities Kingston overall credibility and trust score is 88 per cent, which exceeded the provincial and national benchmark of 84 per cent.

Safety

- **Public Safety**

  - **Component A – Public Awareness of Electrical Safety**

    In January 2020, a public awareness telephone survey was carried out among 400 members of the public, residing in Kingston Hydro's distribution area. The survey followed the requirements established in *Appendix B: Biannual Standardized Scorecard Public Awareness of Electrical Safety Telephone Questionnaire,* published by the OEB on November 25, 2015.

    The survey yielded an overall Public Safety Awareness Index Score of 82 per cent (an increase of three per cent from the 2018 survey result of 79 per cent), demonstrating that many people do have good knowledge or have received some information pertaining to the six core measurement questions. The 2020 results are used for the reporting year of 2021, with the next survey for Public Awareness of Electrical Safety to be carried out in 2022.

  - **Component B – Compliance with Ontario Regulation 22/04**

    For the year 2021, as in previous years, Kingston Hydro was fully compliant with the *Ontario Electrical Distribution Safety Regulation 22/04*. This is substantiated through the annual independent *Audit of Compliance and Declaration of Compliance*, as well as the *Electrical Safety Authority Due Diligence Inspections* (DDI) and *Reports of Public Safety Concerns.*

  - **Component C – Serious Electrical Incident Index**

Results				**Target**
Number of Incidents	km of Line	Rate Default Value	Serious Incident Index	Serious Incident Index
0	335	100	0.000	0.042

For the reporting period, Kingston Hydro did not have any serious electrical incidents.

System Reliability

- **Average Number of Hours that Power to a Customer is Interrupted**
  Kingston Hydro tracks all electricity outages and strives to reduce the length of time they affect customers. The average of 1.41 hours on the scorecard includes both planned interruptions necessary to conduct work safely (0.15 hours) and unplanned/emergency power disruptions (1.26 hours).
- **Average Number of Times that Power to a Customer is Interrupted**
  On this measure, the average of 2.1 includes both planned interruptions (0.11) and unplanned interruptions (2.0).

The target scores for System Average Interruption Duration Index (SAIDI) of 1.41 hours and System Average Interruption Frequency Index (SAIFI) of 2.1 in 2021 were not achieved.

A 44 kV customer-owned equipment failure contributed 35.5 per cent of the annual SAIDI and 18.1 per cent of the annual SAIFI in 2021. A cable termination failed in a customer-owned substation on March 5, 2021. This failure, which was beyond our control, disrupted power to 10,716 customers and caused 13,873 customer-hours of interruptions, or 0.50 in SAIDI and 0.38 in SAIFI.

During a thunderstorm, a number of trips on multiple 44 kV feeders contributed 0.65 in SAIFI or 31 per cent of the annual SAIFI in 2021. A total of four 44 kV feeders were involved in this outage.

Overall in 2021, foreign interference (0.56 hours), defective equipment (0.24 hours) and tree contact (0.14 hours) were the primary causes of interruptions.

Recognizing the importance of system reliability, Kingston Hydro strives to improve these areas for 2022 and beyond. The utility remains focused on proactive tree trimming, preventative inspection, and infrastructure renewal programs.

Asset Management

- **Distribution System Plan Implementation Progress**

Kingston Hydro's five-year capital plan for the 2016-2020 timeframe was filed in 2015 with its first Distribution System Plan (DSP) as part of its 2016 Custom Incentive Rate Setting (Custom IR) rate application. Normally, the OEB expects distributors to update their DSP every five years, but Kingston Hydro requested and received authorization from the OEB to defer the submission of its current DSP from April 2020 to June 2022 due to the COVID-19 pandemic. For the 2021 and 2022 timeframe, Kingston Hydro filed for mechanistic rate changes through the Incremental Rate Making (IRM) application process. Kingston Hydro's most recent five-year capital plan for the 2023-2027 timeframe was filed in June 2022, with its second DSP as part of its 2023 one-year rebasing rate application.

Throughout 2021, the capital plan established under the 2021 IRM guided Kingston Hydro's capital expenditures; however variances by investment category are to be expected due to the dynamic and ever-changing nature of competing investment priorities. The following tables summarize the variance between the 2021 forecast and the 2021 actual net capital additions by OEB investment category:

Table 1 – 2021 Actual and Forecast Capex Variance Analysis

Investment Category	Actual Net Capex$	IRM Forecast $	Variance $
System Access	$671,213	$833,388	-$162,175
System Renewal	$3,208,711	$3,457,000	-$248,289
System Service	$379,947	$15,000	$364,947
General Plant	$362,709	$707,000	-$344,291
Total	**$4,622,581**	**$5,012,388**	**-$389,807**

Table 2 – 2021 Actual and Forecast Percentage Capex Variance Analysis

Investment Category	% Actual Total	% DSP Forecast Total	% Variance of Actual wrt Forecast Category	% Variance of Actual wrt Forecast Total
System Access	14.52%	16.63%	-19.46%	-3.24%
System Renewal	69.41%	68.97%	-7.18%	-4.95%
System Service	8.22%	0.30%	2432.98%	7.28%
General Plant	7.85%	14.11%	-48.70%	-6.87%
Total	**100.00%**	**100.00%**		-7.78%

NOTE: The 2021 forecast did not include a capital contribution forecast therefore the variance is analyzed with respect to the 2021 actual net capital expenditures (exclusive of capital contributions).

The System Access variance of -19.46 per cent (-$162,175) between the actual and forecast amount is attributed to the ongoing COVID pandemic, which has delayed or slowed the completion of several pending developments.

The System Service variance of 2433 per cent ($364,947) between the actual and forecast amount is attributed to the advancement of two 5 kV line rebuild projects to facilitate a 13.8 kV voltage conversion and provide additional line capacity for new development. When compared to the total forecast amount, System Service contributes 7.28 per cent to the overall budget variance. System Service expenditures have historically been relatively low, but are expected to increase over the next few years due to an increase in new development.

The General Plant variance of -48.7 per cent (-$344,291) between the actual and forecast amount is attributed to deferral of expenditures related to computer systems and vehicle purposes, due to supply chain issues caused by the ongoing COVID pandemic. When compared to the total DSP forecast amount, General Plant contributes -6.87 per cent to the overall budget variance.

The majority of Kingston Hydro's capital investment planning (69 per cent of total actual expenditures) continues to focus on System Renewal, which involves replacing and/or refurbishing system assets to extend the original service life of the asset and thereby maintain the ability of the electrical system to provide safe and reliable electrical service to customers. The System Renewal variance of -7.18 per cent (-$248,289) between the actual and forecast amount is partially attributed to the Municipal Substations No. 1 (MS1) rebuild program, which was completed under budget in 2021. When compared to the total DSP forecast amount, System Renewal contributes -4.95 per cent to the overall budget variance, which demonstrates Kingston Hydro's ability to responsibly manage a large number of system renewal projects with varying scope and scale.

Kingston Hydro considers the total annual capital expenditures for 2021 to be "on track" with the Kingston Hydro DSP. The overall variance of -7.78 per cent (-$389,807) is attributed to the effects of the ongoing COVID pandemic and Kingston Hydro's Substation MS1 rebuild program, which was completed under budget in 2021.

Cost Control

- **Efficiency Assessment**
  - Kingston Hydro manages its costs successfully to help ensure customers receive value for the cost of the service. Utilities' total costs are evaluated to produce a single efficiency ranking. Total costs for Ontario LDCs are evaluated by the Pacific Economics Group on behalf of the OEB to divide LDCs into five groups, depending on the difference between their predicted and their actual costs.
  - For the tenth consecutive year, in 2021, Kingston Hydro maintained an efficiency assessment of Group 3, meaning Kingston Hydro's actual costs continue to be within +/-10 per cent of predicted costs. Group 3 is considered average efficiency.
  - Kingston Hydro's total costs in 2021 were 2.3 per cent lower than 2020 compared to an industry average increase of 1.9 per cent.
  - Kingston Hydro's total costs were 12.8 per cent under expected costs compared to an industry average of 13.2 percent under expectations. Infrastructure renewal continues to be the focus of where funds are spent.
  - For the three-year period 2018 through 2020, Kingston Hydro's actual costs have been less than predicted by an average of 7.8 per cent, compared to an average of 10.4 per cent for the industry.
  - Kingston Hydro continues to manage its expenditures to ensure efficiencies will be maintained at a minimum of Group 3.

- **Total Cost per Customer**
  Total cost per customer is the sum of all the capital and operating costs incurred by Kingston Hydro to provide service to its customers, divided by Kingston Hydro's total number of customers.

Kingston Hydro's result for 2021 is $543 per customer, a 3.4 per cent decrease over 2020. This follows a 2020 decrease of 2.1 from 2019. percent. Total operating, maintenance and administrative expenses per customer for Kingston Hydro was $237 per customer, compared to $266 per customer in 2020.

- **Total Cost per km of Line**
  Total cost per km of line is the sum of all the capital and operating costs incurred by the Kingston Hydro to provide service to its customers, divided by Kingston Hydro's total kilometres of line.

  Kingston Hydro's result for 2021 is $45,552 per kilometre of line, compared to the 2020 cost of $46,486 per kilometre of line. This amount decreased by 2.0 per cent for the reasons noted above. Overall, these costs are expected to increase on a yearly basis, as Kingston Hydro replaces old, fully-depreciated infrastructure with new infrastructure.

  Kingston Hydro's 2016 Custom IR rate application has outlined capital and operating costs estimates for the 2016 through 2020 period.

Connection of Renewable Generation

- **Renewable Generation Connection Impact Assessments Completed on Time**
  Kingston Hydro did not receive any requests from customer for connection of renewable generation requiring a condition impact assessment in 2021.

- **New Micro-embedded Generation Facilities Connected On Time**
  One micro-embedded generation facility was connected in 2021, and it was connected within the required timeframe.

Financial Ratios

- **Liquidity: Current Ratio (Current Assets/Current Liabilities)**
  A common way of measuring the financial health of a company is through financial ratios.

  This first ratio measures whether or not the utility has enough resources (assets) on hand at a particular point in time to pay the debts that could become due over the next 12 months. Kingston Hydro's Current Ratio is at 1.69:1.00 (compared to 1.69:1.00 in 2020), as at December 31, 2021. This indicates that for every $1.00 of short-term liabilities due, Kingston Hydro has $1.69 of assets available to fund those payments.

  This ratio will fluctuate somewhat on a year-to-year basis but should remain within the range of 1.4:1.0 to 1.9:1.0.

- **Leverage: Total Debt (includes short-term and long-term debt) to Equity Ratio**

This measures the degree to which the utility is leveraging itself through its use of borrowed money.

The OEB uses a deemed capital structure (debt:equity) of $1.50 to $1.00. This means that for $1.00 invested in infrastructure, the company's deemed regulatory capital financing structure is 60 per cent funding with new debt and 40 per cent with available cash.

Kingston Hydro's debt:equity ratio is $1.10 to $1.00. This means that for every $1.00 the company has invested in assets, 52.8 per cent has been funded with debt and 47.2 per cent has been funded with equity. Kingston Hydro continues to monitor this ratio to ensure it stays at or below $1.50:1.00.

- **Profitability: Regulatory Return on Equity – Deemed (included in rates)**

  Return on equity is the rate of return that the utility is allowed to earn through its distribution rates, as approved by the OEB. Kingston Hydro's current approved deemed return on equity is 9.19 per cent, which was awarded in its latest cost of service proceeding for 2016 – 2020 rates.

- **Profitability: Regulatory Return on Equity – Achieved**

  This shows the utility's actual return on equity earned each year for the period 2017 through 2021. Kingston Hydro achieved a return on equity of 8.39 per cent for 2021.

Note to Readers of 2021 Scorecard MD&A

The information provided by distributors on their future performance (or what can be construed as forward-looking information) may be subject to a number of risks, uncertainties and other factors that may cause actual events, conditions or results to differ materially from historical results or those contemplated by the distributor regarding their future performance. Some of the factors that could cause such differences include legislative or regulatory developments, financial market conditions, general economic conditions and the weather. For these reasons, the information on future performance is intended to be management's best judgement on the reporting date of the performance scorecard, and could be markedly different in the future.

ADMINISTRATION (EXHIBIT 1)

Interrogatory 1.0-VECC-2

Reference: Exhibit 1, Tab 8, Schedule 1, Attachment 1, PDF page 245.

"During the year, the Corporation contracted for certain financial services from the City of Kingston. As at December 31, 2021, the Corporation had an amount due from the City of Kingston representing the cumulative net balance of cash receipts and disbursements processed by the City of Kingston on behalf of the Corporation, in the amount of $8,776,828 (2020 - $6,628,073) The City of Kingston pays the Corporation interest on the balance at a rate of prime minus 1.65%."

a) Please explain why Kingston Hydro calculates interest at a discount to prime rather than an increment to prime as is generally the case for a lender.

Response

a) The amount noted is not a "loan" to the City of Kingston but rather Kingston Hydro cash funds that reside in the Corporation of the City of Kingston's bank account. Kingston Hydro receives interest on its balance at a rate identical to that which the City of Kingston receives from its bank.

This arrangement is part of the multi-utility and shared service model that Kingston Hydro participates in through the shared service model. All cash receipts and cash payments for Kingston Hydro are processed through the City of Kingston's bank account by City of Kingston staff. This arrangement is part of the efficiencies that

Kingston Hydro has benefited from for almost 22 years. If this arrangement was not in place, Kingston Hydro would need to hire full time accounts receivable and accounts payable staff as well as additional accounting staff to reconcile bank accounts, general ledgers etc.

ADMINISTRATION (EXHIBIT 1)

Interrogatory 1.0-VECC-3

Reference: Exhibit 1, Tab 9, Schedule 1

a) Please provide the annual membership fees for USF and GridSmartCity for each year 2016 through 2023 (forecast).

b) If KHC is a member of the EDA please provide the annual membership fees for each year 2016 through 2023 (forecast).

Response

a) Kingston's annual membership fees for USF and it's allocation of mandatory GridSmartCity® membership fees for 2016 through 2023 (forecast) are listed in the table below.

	2016	2017	2018	2019	2020	2021	2022	2023 (forecast)
Utilities Standards Forum Inc. (USF)	$ 8,750	$ 8,750	$ 8,750	$ 8,750	$ 7,950	$ 8,750	$ 8,750	$ 8,925
GridSmartCity® (GSC)	$ 3,220	$ 3,220	$ 3,220	$ 3,450	$ 3,450	$ 4,600	$ 6,900	$ 7,038

b) Kingston is a member of the EDA and the annual membership fees for 2016 through 2023 (forecast) are listed in the table below.

	2016	2017	2018	2019	2020	2021	2022	2023 (forecast)
Electricity Distributors Association (EDA)	$ 48,300	$ 48,800	$ 49,800	$ 50,800	$ 51,800	$ 52,300	$ 52,300	$ 53,300

ADMINISTRATION (EXHIBIT 1)

Interrogatory 1.0-VECC-4

Reference: Exhibit 1, Tab 9, Schedule 1

a) Using 2021 as the last complete year please provide the number of customers who annual receive e-billing
b) For a new customer is the default billing paper or e-billng?
c) Does KCH have any programs which aim to convert paper billed customers to e-billing. If yes please describe these programs.

<u>Response</u>

a) The number of customer accounts for 2021 that received e-billing are as follows:

Rate Classification	# Customers Receive e-Billing
Residential	4,267
General Service < 50 kW	330
General Service 50 to 4,999 kW	59
Large Use	3
Unmetered Scattered Load	7
Street Lighting	0
Total	4,666

b) The customer call center offers e-billing to new and inquiring customers. The default for new customers is billing paper.

c) There are no specific additional programs at this time aimed to convert paper billed customers to e-billing.

ADMINISTRATION (EXHIBIT 1)

<u>Interrogatory 1.0-VECC-5</u>

Reference: Exhibit 1, Tab 9, Schedule 1

a) Does KHC accept credit cards as payment. If yes does KHC (or its agent) add any incremental charge for the use of credit card as a method of payment?

<u>Response</u>

a) Yes, credit cards as payment are accepted using a third-party service provider. There is an incremental charge of 1.75 per cent of the payment amount added for each individual payment of up to $2,500. Kingston Hydro does not receive any part of this incremental charge.