# EB-2019-0082

# Hydro One Networks Inc.

# Application for electricity transmission rates for the period from January 1, 2020 to December 31, 2022

# AMPCO Compendium

# Panel #3

## Hydro One Transmission Rates ($/kW)

| | 2016 Actual | 2017 Actual | 2018 Actual | 2019 Actual | 2020 Forecast | 2021 Forecast | 2022 Forecast |
|---|---|---|---|---|---|---|---|
| **Network Service** | 3.66 | 3.52 | 3.61 | 3.83 | 4.35 | 4.58 | 4.83 |
| *Variance %* | | *-3.8%* | *2.6%* | *6.1%* | *13.6%* | *5.3%* | *5.5%* |
| **Line Connection** | 0.87 | 0.88 | 0.95 | 0.96 | 0.83 | 0.87 | 0.92 |
| **Transformation Connection** | 2.02 | 2.13 | 2.34 | 2.30 | 2.44 | 2.57 | 2.71 |
| **Total** | **6.55** | **6.53** | **6.90** | **7.09** | **7.62** | **8.02** | **8.46** |
| ***Variance %*** | | **-0.3%** | **5.7%** | **2.8%** | **7.5%** | **5.2%** | **5.5%** |

***Source: Hydro One Website***

LCC2019 LARGE CUSTOMER CONFERENCE

hydro one

# Proposed Changes to UTRs

| Year | Network ($/kW) | Line Connection ($/kW) | Transformation Connection ($/kW) |
|---|---|---|---|
| **2018** | $3.61 | $0.95 | $2.34 |
| **2019 (Interim)** | $3.71 | $0.94 | $2.25 |
| **2020** | $4.34 | $0.83 | $2.43 |
| **2021** | $4.58 | $0.87 | $2.57 |
| **2022** | $4.83 | $0.92 | $2.71 |

# IDENTIFYING CUSTOMER NEEDS

## 1. INTRODUCTION

This Exhibit describes the customer engagement activities Hydro One undertakes to determine its customers' needs and preferences, which inform its Transmission System Plan or investment plan and business objectives.

Hydro One's objective is to engage with customers more consistently and proactively, leveraging a better understanding of the customer to better meet their needs and improve overall satisfaction with their service. One critical element of achieving this goal is developing an investment plan that is outcome-focused and designed to meet customers' expectations.

On a regular basis, as part of its everyday operations, Hydro One engages with customers, collecting information on customer needs and preferences. For the purposes of developing the investment plan set out in this Application, Hydro One has undertaken a customer engagement, as is described in section 2.4 of this Exhibit, that is consistent with the OEB's RRFE framework. The company found the feedback from these sessions to be helpful in understanding customer preferences and being better able to identify customer needs.

Customers indicated that the consultations were valuable to them as well, by contributing to their understanding of Hydro One's operations and investment process. Hydro One intends to continue engaging with customers to receive input for future investment plans and to communicate key information about the transmission system and impacts of its investments.

## 2. HOW HYDRO ONE ASCERTAINS CUSTOMER NEEDS AND PREFERENCES

As described below, regular communications with customers are conducted through Hydro One's customer business relations group, the OGCC's customer operating support group, customer account executives, and planning activities undertaken by its asset managers.

### 2.1 Routine Communications

Consistent with the Transmission System Code, Hydro One groups customers into three customer segments: large industrial end users, LDCs and transmission-connected generators.

The "Key Accounts Management" group (formerly, "Customer Business Relations") provides a single point of contact for customers for all types of interactions other than real-time operations, operating events and outage planning. The latter activities are managed by the customer operating support group at the OGCC.

Key Accounts Management facilitates direct communications with customers on a variety of matters including: customer connection requests, sustainment plans and projects, system development plans and concerns regarding service level or power quality. One of the new communication initiatives undertaken in 2015 involved the preparation and distribution of reliability reports specific to the delivery points that supply transmission customers. These reliability reports provide a history of delivery point performance, operating events and outcomes related to these delivery points, and sustainment plans that will impact these delivery points. Hydro One is incorporating the customer feedback that it receives to improve upon the format and content of its communications.

Account executives meet with customers on a regular basis to ensure that customer needs are identified and discussed, and that action plans are developed to address these needs. If the action plans initiate planning activities that may result in new or modified connection facilities, then the account executives also ensure that customers understand the connection process and related contractual matters, such as feasibility studies, connection cost estimates, and capital cost recovery agreements.

Hydro One's asset managers will also proactively and directly engage with customers to review and coordinate plans for the company's assets, in order to minimize impact on the customer and optimize opportunities for both parties to execute work on their respective, affected facilities. The outcomes of these discussions become an input to Hydro One's "transmission system outage grouping" process, which attempts to eliminate multiple outages impacting customer facilities by coordinating activities on the same equipment. Asset managers also engage with customers as part of the regional planning process as documented in Exhibit B1, Tab 2, Schedule 3.

The OGCC has direct communications with customers regarding real-time operations and to coordinate planned outages to enable work by Hydro One or the customer, respond to unexpected outages, and coordinate switching. The OGCC organizes customer meetings bi-annually to coordinate outage planning activities, and such meetings are a key activity in Hydro One's "transmission system outage grouping" process. On a weekly basis, the OGCC sends reports customized to individual customers that provide a rolling one year window of the planned outages that affect their delivery point. These reports contain information on outage start and end dates, the equipment involved, purpose, recall time, and schedule profile. The reports also contain a column for customer comments.

## 2.2 Hydro One Transmission's Customer Forums

Hydro One also regularly organizes a number of customer forums that facilitate group dialogue to address common specific concerns.

### 2.2.1 Power Quality Working Group

One such customer forum is the Power Quality Customer Working Group that is made up of Hydro One staff and industrial customers. This group meets on a regular basis to determine processes to identify, diagnose and measure power quality issues. Hydro One has also facilitated two power quality symposiums with an internationally recognized power quality expert to discuss power quality challenges.

### 2.2.2 Customer Advisory Board

The Customer Advisory Board is organized and facilitated by Hydro One to represent all customer segments on matters relating to customer-impactive policies and services. The board advises Hydro One's management on how to improve services to customers and on the potential customer impacts of the company's policy direction and current initiatives. It includes representatives affiliated with the following associations and groups:

- Association of Major Power Consumers in Ontario;
- Electricity Distributors Association;
- Association of Power Producers of Ontario;
- Consumer's Council of Canada;
- Ontario Federation of Agriculture;
- Canadian Manufacturers and Exporters;
- Vulnerable Energy Consumers Coalition;
- Federation of Ontario Cottagers Associations;

- Small, medium and large LDCs; and
- Large industrial end users.

The Customer Advisory Board meets two times a year to review company initiatives, work program progress, key customer concerns, and proposed asset policies that may affect transmission customers. The mandate of the Customer Advisory Board is being reviewed to further sharpen its focus on customer service.

### 2.2.3 Large Customer Conference

Annually, Hydro One hosts a conference for large transmission customers and Hydro One's large distribution accounts. At the conference, presentations are given regarding Hydro One's various initiatives, the use of new technology and new challenges such as cyber security. Customers are given an overview and update of Hydro One's investment plan and an opportunity to speak with Hydro One staff on any of the topics in the presentations. The conference content and format are tailored to reflect various customer segments.

### 2.2.4 Sarnia Area Reliability Oversight Committee

The Sarnia Area Reliability Oversight Committee consists of Hydro One staff and industrial and generation-connected customers in the Sarnia area. The group meets twice a year to identify issues regarding reliability in the Sarnia Area and to review the proposed investment plans to ensure that issues will be addressed appropriately. The industry in the Sarnia area is very sensitive to any type of voltage excursion, which can result in health and safety issues such as gas flares.

### 2.2.5 LDC Working Group, Toronto-Hydro Oversight Committee

Hydro One also facilitates a LDC working group, which serves as a forum to update LDCs on Hydro One Transmission's policies and practices, identify any emerging issues, and solicit input to enhance customer experience. This group meets three to five times annually.

Hydro One facilitates and participates in bi-monthly Toronto-Hydro Oversight Committee meetings, which serve as a forum for issue identification and resolution to ensure safe and efficient operations between the LDC and Hydro One. These meetings also allow the parties to coordinate their efforts relating to capital projects and other matters.

### 2.2.6 Switchyard Oversight Committees

Hydro One also facilitates and participates in switchyard oversight committees with Bruce Power Inc. and Ontario Power Generation Inc., which oversee matters of mutual interest related to interface equipment, procedures and policies. These committees aim at supporting the safe and efficient operation of the switchyards in compliance with legal requirements and the coordination of efforts relating to capital projects and other matters. They meet approximately three times annually.

## 2.3 Customer Survey Research

Hydro One Transmission's customer information input is also obtained through formalized customer satisfaction research. This initiative has been ongoing since 1999. All research is conducted by independent expert consumer research firms. The latest initiative was carried out by Northstar Research Partners Inc., which is described in

Exhibit B1, Tab 1, Schedule 3, together with detailed information on Hydro One Transmission's customer satisfaction performance.

## 2.4 Customer Engagement Work For The Investment Plan

In the spring of 2016, Hydro One undertook a further customer engagement initiative, the purpose of which was to identify the needs and preferences of customers as it related to the formulation of a five year transmission system plan. This initiative was structured to identify customer needs and preferences and allow for the consideration of those customer needs and preferences in preparing the Transmission System Plan that is reflected in this Application.

Hydro One engaged Ipsos Reid, a global market research company, to assist in the design, execution, facilitation, and documentation of the customer engagement initiative. Ipsos Reid also undertook analysis of the feedback received during the consultations. The report by Ipsos Reid documenting the results of the consultation is included as Attachment 1 to this Exhibit.

### 2.4.1 Methodology

The customer engagement occurred in three parts. These parts were not sequential; they occurred concurrently. First, one-on-one meetings were held with 12 customers. The materials provided to customers in these consultation meetings are provided in Attachment 2 to this Exhibit. Hydro One segmented and identified the customers for these meetings using the approach described below. Second, Ipsos Reid facilitated five group customer consultations in Toronto, London, Ottawa, Thunder Bay and Sudbury. 22 customers participated in these facilitated group customer consultations. Third, an on-

line consultation tool was made available to all customers, and 28 customers participated. A copy of the online consultation materials is provided in Attachment 3 to this Exhibit.

This three-part process was designed to ensure that all customers had an opportunity to participate in the consultation process and have their voices heard in an effective manner.

Hydro One chose which customers to meet with one-on-one based on a number of criteria:

- the customers represented at least five percent of Hydro One Transmission's overall revenue;
- the customers were among the largest within each sub-segment (i.e. LDCs, large industrial end users, and generators);
- the customers gave a range of scores on 2015 Hydro One Transmission's customer satisfaction survey;
- the customers experienced a range of reliability performance; and
- the customers were geographically diverse.

Further information on the consultation goals, objectives and methodology is included in the Ipsos Reid report included as Attachment 1 to this Exhibit.

### 2.4.2 Information Presented to Customers

In the consultations, Hydro One presented the following information:

- an overview of Hydro One Transmission's system;
- an overview of a risk-based approach to investments;
- the purpose of Hydro One's customer engagement process (i.e., to identify customers' needs and preferences);
- a description of Hydro One Transmission's system reliability performance;

- the causes of power interruption duration and frequency;
- the types of equipment causing interruptions and their relative contributions;
- an explanation of Hydro One's use of asset demographics and asset condition assessment to identify specific assets at risk;
- a description of actions that Hydro One has undertaken to mitigate reliability risk without increasing investment; and
- a presentation of three illustrative investment scenarios to prompt discussion of acceptable levels of risk compared to investments and potential rates consequences.

The presentation that was shared with customers is provided in Attachment 2 to this Exhibit.

The results of the customer engagement were summarized in the Ipsos Reid report in Attachment 1 to this Exhibit. Attachment 1 to Exhibit A, Tab 9, Schedule 1 contains an overview of these consultations that Hydro One presented to stakeholders on April 27, 2016.

The Ipsos Reid report made the following observations:

- Reliability was the most frequently and consistently mentioned "need" that was raised by customers across all the consultation activities.
- For most large industrial customers, frequency of interruptions is a greater concern than duration. Conversely, LDCs were more likely to say that duration of interruptions is a greater concern than frequency of interruptions.
- Planned outages are considered by many to be much more manageable and less of a concern than unplanned interruptions.
- Overall power quality and transmission capacity were also raised as major issues facing customers, particularly those in the north.

- Cost was raised at various times throughout the consultation. The desire for good reliability at a competitive or low cost is universal.

The detailed report indicates variations on these observations among customer types. For example, LDCs communicated concerns regarding duration of outages, whereas large industrial end users expressed concerns regarding outage frequency. LDCs also expressed that their customers were increasingly expecting fewer to no service interruptions. While the desire for low or competitive costs is universal, sensitivity to rate increases varied between groups.

## 3. SUMMARY OF CUSTOMER NEEDS AND PREFERENCES

Based on all the information collected during its customer engagement activities, Hydro One believes that:

- Customers need predictable, reliable power at the current level of performance or higher, particularly, with respect to frequency of interruptions, especially large industrial end users who otherwise face unacceptable economic, environmental and health and safety risks;
- Customers prefer competitive or low cost of service, but not at the expense of deteriorated service;
- Customers need improved outage planning and notification (specifically, minimization of the number of planned outages and improved communication);
- Customers expect continuing communication of Hydro One Transmission's long-term investment plans; and
- Customers need a greater focus on power quality driven by the increased sensitivity of their equipment.

## 4. HOW THE TRANSMISSION SYSTEM PLAN REFLECTS CUSTOMER NEEDS AND PREFERENCES

Hydro One's Transmission System Plan reflects its general assessment of customer needs and preferences. The investment plan takes customer engagement information into account as follows:

- The plan mitigates the risk to current service levels posed by asset deterioration;
- The plan supports Hydro One's ability to continue to provide first quartile reliability in a safe manner; and
- The plan optimizes the life of assets to avoid unnecessary capital expenditures.

The investment plan reflected in this Application seeks to meet customers' needs regarding service levels, in a manner that controls costs to address their desire for low or competitive costs. Hydro One recognises that customers are sensitive to the total delivered price of power. Investments in the transmission system result in increased cost to customers. As such, Hydro One's focus will be on executing cost controls and driving productivity across the organization in order to mitigate rate impacts from required work programs. Hydro One's ability to influence customers' total bills, and customer perceptions of the price of power, is limited by the fact that the transmission tariffs represent less than 10% of an average transmission-connected customer's total bill.[1] Ongoing communications with customers to provide information regarding these facts will be another area of focus for Hydro One during the test years in this Application.

Exhibit B1, Tab 3 describes how the proposed investments address Hydro One Transmission's customers' needs.

[1] Transmission tariffs constitute 8.3% as percentage of total cost for transmission-connected customers, on average.

## 1.3 (5.2.2) CUSTOMER ENGAGEMENT – HOW HYDRO ONE'S INVESTMENT PLAN INCORPORATES THE NEEDS OF CUSTOMERS

Hydro One's transmission system serves a diverse customer base made up of: (i) electricity generators who deliver power to the transmission system; (ii) distributors who deliver power to direct customers; and (iii) end-users such as mining and industrial enterprises that use the power themselves at transmission level voltage.

Hydro One's customers are located throughout the province. Serving customers in northern and rural areas presents different challenges due to sparse populations, remote location of assets and often, single-phase circuits. Conversely, customers in non-rural, more populated areas often share multi-circuit lines with other transmission customers. Indeed, the three customer groups described above often have needs and preferences unique to their segement. Engaging with these different customer segments requires a number of channels for customer engagement.

Through its broad range of customer engagement activities, Hydro One has developed a clear and specific understanding of the outcomes that its transmission customers care most about, as well as the level of spending and mix of investments that customers would most like to see included in Hydro One's investment plan. The feedback received from customers through these engagement activities is an important and direct input into Hydro One's investment planning process. Consequently, Hydro One's capital expenditure plan, as set out in Section 3 of this Transmission System Plan ("TSP"), is closely aligned with and highly responsive to the customer needs and preferences that Hydro One has identified.

This section describes the various initiatives through which Hydro One has developed an understanding of the specific needs and preferences of customers, including a customer engagement survey that was carried out specifically to inform this TSP. The feedback

received from these processes has contributed to Hydro One's understanding of the outcomes that are of the greatest value to its transmission customers. This feedback has been inputted directly into Hydro One's investment planning process. The results of the customer engagement survey have been re-affirmed by feedback received from subsequent ongoing customer engagement activities.

### 1.3.1 (5.2.2 A) IDENTIFICATION OF CUSTOMER NEEDS AND PREFERENCES

Hydro One collects feedback from transmission customers through the following initiatives:

- Customer Engagement Surveys;
- Large Customer Account Management;
- Ontario Grid Control Centre's ("OGCC") Customer Operating Support Group;
- Large Customer Conferences;
- Oversight Committees and Working Groups;
- Customer Satisfaction Surveys and Research; and
- Focussed Planning Meetings with Customers.

These initiatives are firmly integrated into Hydro One's business practices and are fundamental to the way Hydro One interacts with its customers and carries out its transmission business. The Customer Engagement Survey has been a valuable process for supplementing, formalizing and validating the feedback Hydro One collects through ongoing engagement activities, and for formalizing the manner in which this feedback is integrated into investment planning.

Figure 1 below is a summary of key priorities for customers based on customer engagement and specific steps taken to incorporate customer considerations into the investment planning methodology and overall investment strategy.

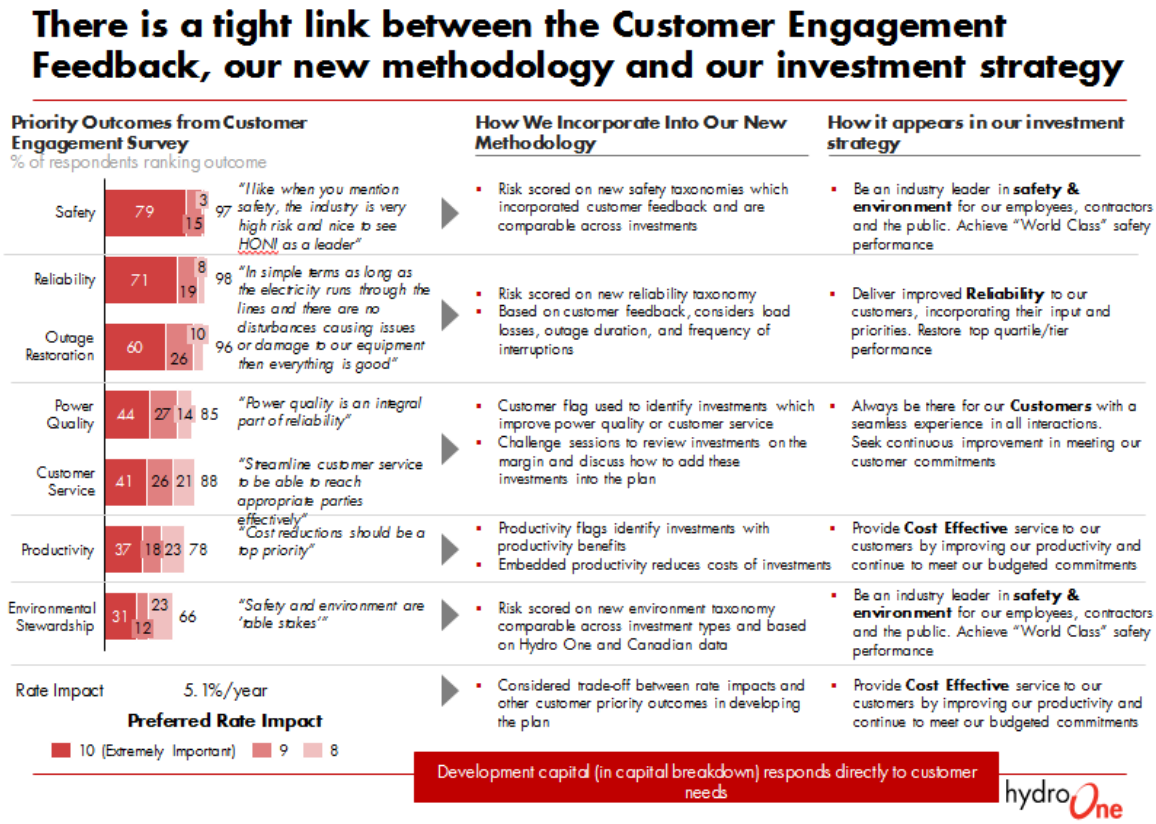



**Figure 1 - Incorporation of Customer Considerations Into the Investment Strategy**

Section 2.1 of the TSP explains how customer feedback is considered in Hydro One's investment planning process. Section 3.2 of the TSP explains how the proposed capital expenditure plan reflects the outcomes valued by customers.

### 1.3.2 (5.2.2 A) CUSTOMER ENGAGEMENT SURVEY

The Transmission Customer Engagement Survey process enables Hydro One to engage in formal discussion with its transmission customers for the purpose of obtaining feedback to inform Hydro One's investment planning process. This process aligns with Hydro One's vision to be a customer-focused commercial entity with a transmission investment plan that will drive the outcomes that customers value by demonstrating responsiveness to identified customer needs and preferences, including how to make trade-offs between outcomes and costs.

#### 1.3.2.1 BACKGROUND AND OBJECTIVES

In 2016, Hydro One introduced a Transmission Customer Engagement Survey process. The approach taken by Hydro One in its 2017 survey was improved by incorporating lessons learned and addressing comments made about the 2016 survey.

In 2017, Hydro One engaged Innovative Research Group ("IRG"), an experienced third party research and consultation firm, to develop and implement a second iteration of the Transmission Customer Engagement Survey process (as outlined in Appendix 1). Content for the 2017 Transmission Customer Engagement Survey incorporated lessons learned from the 2016 Survey process, including feedback received from the OEB and interveners in the last transmission rate proceeding (as outlined in Appendix 2). This content established a framework for Hydro One to obtain useful, credible and unbiased information to guide the investment and business planning efforts that underpin this TSP.

The scope of the 2017 survey was also expanded beyond the level of investments. In 2016, customers were mostly asked what funding level was appropriate. In 2017, the survey sought customer feedback regarding which investments should be prioritized by evaluating what outcomes customers valued.

Through the 2017 Transmission Customer Engagement Survey process, Hydro One further developed its understanding of the needs and preferences of its transmission customers that were considered at various points in Hydro One's investment planning process. Hydro One carried out this customer engagement process early in the planning process to allow sufficient time for customer needs and preferences to be considered and integrated into the transmission investment planning and business planning processes.

Detailed results of the 2017 process are set out in the IRG Customer Engagement Report provided in Attachment 1. Appendix 1 outlines the process and timing of the engagement survey, and Appendix 2 outlines the feedback heard from OEB staff and interveners regarding the 2016 process and the specific steps taken to address that feedback as part of the 2017 process.

**1.3.2.2 (5.2.2 B) SUMMARY OF CUSTOMER NEEDS AND PREFERENCES**

All transmission-connected customers were invited to participate in Hydro One's customer engagement survey. Over 100 Hydro One transmission-connected customers participated in the 2017 Transmission Customer Engagement Survey, reflecting a participation rate of 66%. This improved level of participation reflected the involvement of 103 out of Hydro One's 156 transmission-connected customers including a large number of LDCs. These 2017 participation rates were 51% higher than those of the 2016 customer engagement.

Hydro One's Transmission Customer Engagement Survey process yielded valuable feedback concerning the specific needs and preferences of its transmission-connected customers to shape Hydro One's investment plans. The prioritized list of outcomes valued by Hydro One's transmission customers is presented in the figure below (reproduced from Attachment 1):

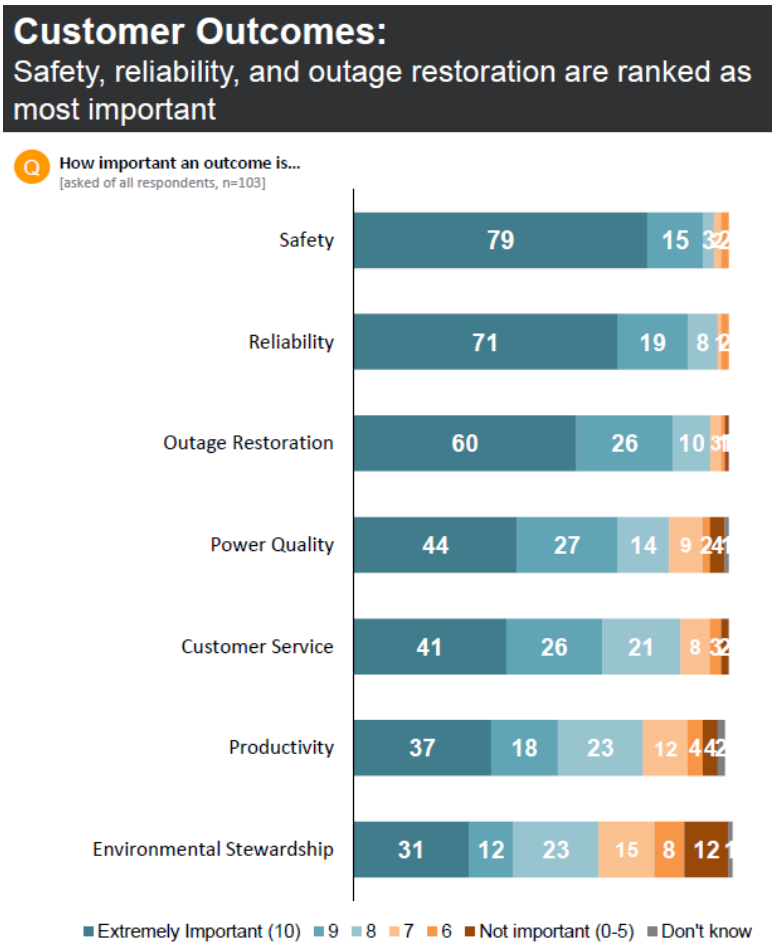



**Figure 2 - Customer Outcomes**

The key messages and results received by Hydro One from the 2017 Transmission Customer Engagement Survey are as follows:

- Safety, reliability, and outage restoration are customers' top prioritized outcomes;
- All customer segments prefer to see investments spread out over time versus investing now with higher rates in the short term and lower future increases or delaying investments with lower rates in the short term and higher future rates;
- Reducing the frequency of outages is more important than reducing the duration of outages. However, the most important issue is to reduce the number of day-to-day interruptions;

- When presented with several investment scenarios, the majority of customers preferred investment levels in line with the investment plan that was before the OEB in the Prior Proceeding by at least a three to one margin. It is seen as reflective of the current approach which has served the system well, and a less risky option; and
- About half of end-user participants (19 of 38) rate power quality as an "extremely important" outcome.

Despite different perspectives, most customers agreed that improvements in both frequency and duration of outages are among their top needs. Power quality and transmission capacity were also raised as major issues facing customers, particularly in northern Ontario. Cost was also raised at various times throughout the survey. The desire for good reliability at a competitive or low cost was universal.

### 1.3.3 (5.2.2 A) CUSTOMER SATISFACTION SURVEYS AND RESEARCH

In addition to Hydro One's customer engagement surveys, Hydro One regularly solicits feedback from customers through a variety of channels to be leveraged throughout Hydro One's planning process.

#### 1.3.3.1 CUSTOMER SATISFACTION SURVEYS

Since 1999, Hydro One has been collecting feedback from transmission customers through an annual customer satisfaction research process. The customers surveyed are critical to the success of Hydro One's business, and are also critical to the communities in which they operate. The trending of results over time assists Hydro One in identifying areas to improve transmission customer satisfaction. Hydro One uses this data to inform and improve business practices and stay informed about the trends that matter most to transmission customers. Customer Satisfaction scores are also included in Hydro One's Corporate Team Scorecard (Exhibit F, Tab 4, Schedule 1, Attachment 4) and Hydro One's proposed Transmission Scorecard (as described in Section 1.5 of the TSP).

This research is conducted by independent expert customer research firms. The most recent iteration of this research was carried out and reported on by Innovative Research Group in 2018 and is described in Section 1.5 of the TSP.

The objectives of the Large Transmission Customer survey are to measure the level of customer satisfaction, and to monitor Hydro One's performance in four dimensions of satisfaction among customers: Price, Customer Service, Product Quality/Reliability and Relationship. The survey measures customer perceptions of the Company (whether they have interacted with Hydro One recently or not), with a specific focus on how well the Company meets expectations and delivers on critical success factors. The survey is administered to transmission-connected Generators, End Users and all LDCs. The

customer survey research is used to evaluate the overall satisfaction levels of these customers groups, and to better understand their perceptions of Hydro One.

Figure 3 illustrates the trend of the overall satisfaction results. In 2018, Overall Satisfaction was at the highest point in the past seven years at 90%, which is a 12% increase since 2016. The increase in overall satisfaction can be attributed to LDCs and generation customers. The main driver identified through analysis for higher customer satisfaction was customer communication and key account managers. The identified driver correlated with lower satisfaction was the ability to recall a planned outage. Additional information can be found in TSP Section 1.5 and the complete 2018 survey results can be found in Attachment 5 to this exhibit. The greatest dimension of high customer satisfaction was customer service, with 93% satisfaction with communications methods, 93% satisfaction with customer service overall and 90% satisfaction with key account services from account executives. A majority, 60%, are satisfied with Hydro One's product. Some dimensions with lower product satisfaction include number of unplanned outages, a dimension 50% of customers are dissatisfied with.


**Figure 3 from Exhibit B1, Tab 1, Schedule 1, Section 1.5 – Overall Customer Satisfaction, Corporate Survey (% satisfied)**

### 1.3.3.2 (5.2.2 B) ONTARIO GRID CONTROL CENTRE TRANSMISSION CUSTOMER SURVEY

Hydro One's Ontario Grid Control Centre ("OGCC") has surveyed satisfaction among its medium and large business customer satisfaction since 2013. The main objective of the survey is to determine key dimensions of satisfaction, strengths, and opportunities and to improve customer service policies, service delivery processes and communications in the areas of accountability of the OGCC such as outage planning and interruption restoration information. Overall satisfaction with OGCC has improved over the past year (98% in 2018 vs. 94% in 2017). The greatest driver of OGCC customer satisfaction was communications and responsiveness. Hydro One's average performance over the past five years was 90 per cent, and the overall trend indicates that satisfaction with outage planning procedures is improving. Over the rate period, Hydro One plans to maintain its historical average, targeting 90 per cent satisfaction with outage planning procedures.

Additional information can be found in TSP Section 1.5. The complete 2018 OGCC customer survey results are provided as Attachment 6 to this exhibit.

### 1.3.4 (5.2.2 A) ONGOING CUSTOMER ENGAGEMENT

Hydro One believes that understanding customers, and their needs, is critical to a successful business. Hydro One engages with customers regularly and through different mechanisms. Customer needs can be categorized as either (i) initial connection needs, or (ii) needs of connected customers.

Initial connection needs are generally identified either through the Hydro One customer connection process or by need assessments and customer consultations under the regional planning process, as described in TSP Section 1.2. The regional planning process ensures that needs are assessed and identified by Hydro One in conjunction with customers, the IESO and LDCs.

Once connected, customer needs are identified by continuous monitoring of the power system. Hydro One planners continuously engage with customers (e.g. LDCs, industrial and commercial transmission-connected customers) to discuss and solicit feedback on investments to address end of life asset replacements. Open dialogue with customers during the planning stages of candidate investments ensures customers' needs and preferences are addressed in a collaborative manner, and it allows customers to have a voice regarding technical system requirements such as improved station configuration to enable greater operational flexibility, and changes in work execution practices and processes that impact customers. Customer feedback also provides valuable information that planners incorporate into the Investment Planning Process during the Asset Risk Assessment ("ARA") process (discussed further in TSP Section 2.1) to inform the development of investment candidates.

#### 1.3.4.1 ONGOING CUSTOMER ENGAGEMENT SURVEY (RRFE)

Hydro One is implementing an Ongoing Customer Engagement Questionnaire that will quantify transmission customers' satisfaction regarding a variety of reliability focused

measurements. The Questionnaire asks about customer satisfaction with Hydro One's current work program; satisfaction with outages, power quality, and reliability; investment priorities; unplanned outages mitigation and impact; and rate impacts.

Although the questionnaire asks customers to rank satisfaction of key indicators on a scale of 1-5, the survey also addresses specific preferences, asking customers if they would prefer shorter and more frequent outages or longer and less frequent outages, for example. Results of these questions will be inputted into Hydro One's Customer Relationship Management system, which keeps records of customer agreements, issues complaints, feedback and CSAT results. These questionnaire results will directly inform Investment Planning on problem areas that need to be mitigated, as well as broader customer preference trends to apply across the system. The questionnaire will be done on an annual basis to give planners a continuous source of customer information beyond CSAT scores, beginning in 2019.

Directly connected transmission customers currently receive an annual reliability report which summarizes historical and annual performance at transmission and distribution delivery points, describes investments recently made in the customer's area, investments planned in the customer's area and upcoming maintenance in the customer's area. The reliability report allows customers to provide informed input into customer engagement touch points, such as Hydro One's new Ongoing Customer Engagement Questionnaire.

### 1.3.4.2 LARGE CUSTOMER ACCOUNT MANAGEMENT

The Large Customer Account Management Group (formerly, "Customer Business Relations") provides customers with a single point of contact at Hydro One for all types of interactions. In particular, this group communicates with customers on matters that include customer connection requests, sustainment and system development plans and projects, and concerns regarding service levels or power quality.

Account Executives from Hydro One's Large Customer Account Management Group meet with transmission customers on a regular basis to ensure that the needs of customers are identified and discussed, and action plans are developed to address these needs. If an action plan results in new or modified connection facilities and/or asset needs, then the Account Executive will directly communicate with the affected customer(s) to ensure a common understanding of the related connection process and contractual requirements, such as connection cost estimates and capital cost recovery agreements. Examples of investments included in this TSP that have resulted from direct communication by Account Executives in Hydro One's Large Customer Account Management Group with customers, are Enfield TS and the Seaton MTS Connection. Hydro One's transmission system planners developed candidate projects to address the customer needs identified in action plans. Risks associated with each of these candidate projects were considered throughout Hydro One's investment planning process and resulted in the inclusion of the Enfield TS and Seaton MTS Connection projects in Hydro One's capital expenditure plan.

Hydro One's Account Executives proactively engage with transmission customers to review and coordinate planned outage activities to minimize impacts on customers and to optimize opportunities for both Hydro One and customers to plan and execute work on their respective facilities. The outcomes of these discussions are used as inputs to the OGCC's Transmission System Outage ("TSO") process to coordinate multiple work activities on the same equipment during a single outage, as discussed further below. Account Executives also participate in the OGCC's meetings with customers to discuss planned outages and work as part of the regional planning process, discussed in TSP Section 1.2.

In 2018, Hydro One addressed the OEB's finding that: "Hydro One should improve its internal institutional processes to better inform the transmission performance management system of distribution customers' satisfaction level for the purpose of

gauging what, if any, elements of transmission operation are the cause of any dissatisfaction".[1] In response, among other things, the Company began consolidating the service delivery model for its largest customers having a 2 MW demand or more including Hydro One's distribution-connected end use consumers. This change will introduce a similar level of customer service for Hydro One's Large Distribution Accounts ("LDA") that Hydro One's transmission-connected customers currently receive, including the assignment of Account Executives to LDA customers, tracking of customer information and interactions, and identifying opportunities for advocacy for these large customers across the company.

In particular, this approach will facilitate the consistent and more complete reporting of customer needs and preferences for use by planners, operators and customer service teams to consider when making transmission planning and investment decisions. Further details in respect of how Hydro One addressed the OEB's findings quoted above are set out in Appendices 1, 2 and TSP Section 1.5.2.

#### 1.3.4.3 OGCC'S CUSTOMER OPERATING SUPPORT AND OUTAGE PLANNING GROUP

The OGCC's Customer Operating Support Group works directly with transmission customers to efficiently plan real-time outage operations, coordinate planned outages so Hydro One or the customer can complete required work, to respond quickly to unexpected outages, and to coordinate switching activities.

The Outage Planning Group organizes bi-annual customer meetings throughout the province to coordinate outage planning activities. These meetings are a key activity in Hydro One's TSO process. The OGCC sends reports, customized for individual customers that provide a rolling, one-year window of the planned outages that will affect

[1] EB-2016-0160, Decision and Order (November 1, 2017), pp. 38-39

the customer's delivery point. These reports contain information on outage start and end dates, the equipment involved, purpose, recall time and schedule profile. The reports provide an opportunity for customers to provide feedback. The Outage Planning Group also provides information on Hydro One's plans, particularly with respect to outages, for the balance of the year and/or the next scheduling year. During these meetings, customers may bring forward their own maintenance plans for their facilities, with a view to scheduling or bundling outages in a manner that minimizes the frequency and duration of outages for both the utility and the customer.

### 1.3.4.4 LARGE CUSTOMER CONFERENCE

Each year, Hydro One organizes and hosts a Large Customer Conference for all large transmission and large distribution (2 MW+) customers. The focus of the conference is to provide an opportunity for large customers to hear about Hydro One's plans and initiatives, ask questions, discuss their interests, and raise concerns with representatives and executives from several Hydro One lines of business. To ensure that the conference addresses the specific areas of interest for these customers, Hydro One seeks customer input prior to the conference to inform the conference agenda. This provides initial insights into the issues that are top of mind to Hydro One's large customers. At the conference, customers who are directly connected to the transmission system are presented with information about significant upcoming Hydro One initiatives that may affect them, including any technological changes they would need to be aware of or other potentially impactful initiatives.

In recent years, Hydro One has used these conferences as an opportunity to provide large customers with presentations about Hydro One's planned investments and activities. In addition, large customers are given an opportunity during each Large Customer Conference to meet with Hydro One staff, including Planning staff, to share information and raise concerns. In addition to Planning staff learning about customer needs and preferences through these informal conversations, feedback received during the

conference, and through post-conference customer surveys, is subsequently provided to Planning for further consideration. Recent feedback suggests that customers would like to hear more about reliability, maintenance procedures and lowering recall time in outages.

### 1.3.6 (5.2.2 A) INCORPORATING CUSTOMER NEEDS INTO THE PLAN

Insights from recent surveys reveal customers are seeking improvements in the following areas:

- Safety, reliability, and outage restoration are customers' top prioritized outcomes;
- All customer segments prefer to see investments evenly spread out over the long term;
- Reducing the frequency of outages is more important that reducing the duration of outages. However, the most important issue is to reduce the number of day-to-day interruptions;
- The majority of customers prefer to maintain levels of investment in line with the proposal filed in Hydro One's last transmission rate application (EB-2016-0160), rather than to increase or decrease investment levels;[2]
- End user participants rate power quality as an "extremely important" outcome;
- Reliability metrics used by Hydro One do not adequately capture events on the network that may actually be associated with power quality;
- Customers would like to have more assistance investigating power quality events;
- Customers would like reduced timelines for connection estimates;
- Customers would like lower connection costs;
- Customers desire improved communication and transparency; and
- Customers believe Hydro One should be easier to do business with.

Hydro One's full spectrum of customer engagement initiatives is leveraged to increase its understanding of customers' needs and preferences; enhance Hydro One's ability to provide the expected level of service; produce outcomes that are valued by customers;

[2] Customer preferences are set out in Attachment 1 of Section 1.3 of the TSP.

and result in an improvement to customers' overall satisfaction with Hydro One's Transmission business.

As part of the multi-step investment planning process described in TSP Section 2.1, planners develop a set of candidate investments that are designed to address the relevant asset needs and risks, and incorporate transmission customers' needs, preferences and feedback to inform the capital expenditure plan.

### 1.3.6.1 IDENTIFYING TRENDS

Cross functional sessions are held to review all customer engagement results, identify broad trends and specific customer needs and preferences. This review provides a basis to capture customer needs and preferences in the investment planning process and improve alignment between individual candidate investments identified by planners and the outcomes of the customer engagement activities.

### 1.3.6.2 INVESTMENT ASSESSMENT

Since the last transmission rate application, Hydro One has introduced investment planning process improvements, including a revised scoring process and a formalized flagging framework as described in TSP Section 2.1.4. The feedback provided through the customer engagement process informed the enhanced risk and scoring framework. In particular, the revised scoring process focuses on assessing risk related to safety, reliability and environmental considerations. These three outcomes are among the top customer priorities identified and validated through Hydro One's customer engagement. As risk scoring is the dominant evaluation method for candidate investments, customer needs and preference are reflected in all risk-scored investments.

In addition to investment scoring for safety, reliability and environmental risk, investments are flagged for factors including customer needs and preferences identified through the engagement process. A full list of flags is included in TSP Section 2.1.4.2.

Examples of customer needs and preferences that were identified through customer engagement and flagged include:

- Concerns expressed with delivery point performance as a result of nuisance wildlife or equipment configuration;
- Coordination of asset maintenance and replacement activities with generator customers during planned outages to minimize disruptions to operations;
- Concerns expressed with power quality; and
- Addressing worst performing delivery points (outliers).

### 1.3.6.3 CALIBRATION SESSIONS

Following the development of investment candidates and risk scoring, structured calibration sessions are held to ensure that scoring and the application of flags is consistently applied across the organization. Based upon business knowledge gathered through customer-facing efforts described earlier and results obtained through the Transmission Customer Engagement Survey, management validates that the investments are responsive to customer needs and preferences by comparing the description of the need/preference with the high level themes identified through the customer engagement results.

### 1.3.6.4 OVERALL FUNDING ENVELOPE

The feedback received through the customer engagement process influenced the company's decisions around the overall funding envelope. As part of the customer engagement survey, respondents were provided with descriptions of four illustrative investment scenarios. They were then provided with a line of data points that started at zero and extended beyond all four of the illustrative investment scenarios. Customers were asked to select any point along that continuum that reflected what they believed to be the best and most appropriate balance between rates impacts and outcomes:

- Scenario A was based on limited investment;
- Scenario B involved a decrease in the current level of investment;

- Scenario C would maintain the current level of investment; and
- Scenario D would increase beyond the current level of investment.

Scenario C, which maintains the current level of investment proposed in EB-2016-0160, reduces reliability risk, improves long-term reliability performance and offers level future rate increases, was strongly favored over the other three scenarios with 24% of respondents selecting this scenario. Respondents indicated their preference through the selection of a point along a line showing the spectrum of scenarios; 21% chose a point between Scenario B and Scenario C and 17% chose a point between Scenario C and Scenario D. This clustering informed the initial funding envelope.

#### 1.3.6.5 PRIORITIZATION, OPTIMIZATION, ENTERPRISE ENGAGEMENT AND MANAGEMENT REVIEW AND APPROVAL

Following review and calibration, all candidate investments were aggregated into a consolidated portfolio for prioritization with a view to reflecting the level of investment most preferred by customers in the customer engagement exercise. While the initial prioritization and optimization is risk based, subsequent structured and facilitated trade-off discussions identify projects on the margin and determine allocation of funding based on consideration of investment merits from both risk and non-risk perspectives, such as the appropriate incorporation of customer needs and preferences.

Ultimately, Hydro One determines a funding envelope that balances identified transmission customer needs and preferences with rate impacts and asset/system needs. These considerations are integral in the review and final approval of the Business Plan by the Executive Leadership Team and Board of Directors.

The manner in which the proposed capital expenditure plan reflects the aforementioned transmission customer engagement initiatives, including in particular the 2017 Transmission Customer Engagement Survey process, is discussed in TSP Section 3.2.2.

### 1.3.7 ATTACHMENTS: CUSTOMER ENGAGEMENT

Attachment #1 - Customer Engagement Survey

Attachment #2 - Stakeholder Engagement Session Presentation Slides

Attachment #3 - Stakeholder Session Notes

Attachment #4 - Reliability Risk Summary

Attachment #5 – Large Tx Customer Satisfaction Survey Report

Attachment #6 – OGCC Customer Satisfaction Survey – 2018 Results

## APPENDIX 1: CUSTOMER ENGAGEMENT PROCESS AND TIMING

Managers and Executives from Hydro One's Customer Service, Planning and Regulatory groups met in February 2017 to plan and prepare for the 2017 Transmission Customer Engagement Survey process, with a view to using the results of this initiative to guide and inform the investment planning process as part of this Application.

Hydro One determined that all of its transmission-connected customers would be invited to participate in this process and that, given the discrete number of transmission customers (in comparison to the number of customers that need to be engaged with to support preparation of a Distribution System Plan), this effort would be qualitative rather than quantitative (i.e., it would provide guidance directionally, but not statistically, due to the limited population size of the transmission customer base). The survey was also developed based on the engagement sessions with stakeholders from the 2017/2018 application.

The 2017 Transmission Customer Engagement Survey process was implemented based on the following schedule.

| Description | Date |
|---|---|
| Final Survey Submitted | 03-May-17 |
| Survey In Field | 11-May-17 – 15-Jun-17 |
| Interim Report | 31-May-17 |
| Survey Concluded | 09-Jun-17 |
| Final Report | 02-Jul-17 |

Findings were used to inform the plan as it was iteratively developed through the planning and feedback process.

Detailed results of the 2017 process are set out in the IRG Customer Engagement Report provided in Attachment 1.

## APPENDIX 2: INCORPORATING FEEDBACK INTO THE CUSTOMER ENGAGEMENT SURVEY

Hydro One's approach to engaging transmission customers has evolved, and continues to evolve, in response to the OEB's recommended areas for improvement as set out in its September 28, 2017 Decision and Order in proceeding EB-2016-0160. In particular, the OEB found that Hydro One should (i) begin its customer engagement process sufficiently in advance of filing the application to allow for timely input to be incorporated in a meaningful way and to improve the level of customer attendance; (ii) include LDCs so as to determine practical ways to seek some input from their end users; (iii) incorporate timely and meaningful input from First Nations representatives; (iv) ensure that information presented to customers is unambiguous and easy to understand.[3]

The 2017 Transmission Customer Engagement Survey was designed to be responsive to feedback heard from OEB staff and intervenors in the EB-2016-0160 proceeding and is consistent with the Board's findings in its Decision and Order. Hydro One made a number of improvements that address the Board's findings.

### FINDING 1: TIMING OF CUSTOMER ENGAGEMENT SURVEY

The 2017 engagement survey was completed prior to the Investment Planning Context phase of the Investment Planning Process outlined in Section 2.1 of Transmission System Plan.

### FINDING 2: INCLUDE FEEDBACK FROM LDC END-USERS

Hydro One's transmission system is the upstream supplier of electricity to LDCs across the Province of Ontario. Electricity is transmitted over the Hydro One transmission system to Delivery Points ("DPs") with the LDCs. DPs are boundaries between the electricity systems of Hydro One and the LDCs. Each LDC has significant power

[3] See OEB, Decision and Order in EB-2016-0160, September 28, 2017, pp. 24 and 117.

requirements, unique needs, a diverse group of end-use customers, and most importantly, distribution systems designed to meet their requirements and needs, to service their end-use customers. There is no direct link between the Hydro One transmission system and the LDC's end-use customers.

In Hydro One's 2017 Transmission Customer Engagement Survey, Hydro One asked LDCs to identify whether their responses to the survey were informed by their own customer engagement activities for the purposes of their own rate applications, or by any other customer research. Of the 28 respondents, 11 answered "yes" to this question. Additionally, Hydro One's Account Executives interact with the LDCs, and engage the LDCs in discussion regarding the needs of their ultimate end-use customers, as described above. Results from these inputs were considered by Hydro One during its investment planning process. In addition, Hydro One noted that in customer surveys conducted by other LDCs, residential customers, small business customers (general service<50 kW), and mid-market customers (general service>50 kW) consider price their number one priority and reliability their number two priority whereas larger demand key accounts prioritize reliability over price. These results demonstrate the importance of keeping costs as low as possible while maintaining system integrity to ensure reliable service to businesses in the province.

Subsequent to the issuance of the OEB's decision, Hydro One contacted some LDCs to solicit further approaches it could use to solicit feedback from LDC end-users, in the future. The feedback from LDCs included: (i) suggestions to continue using the account executive model to serve the needs of LDC customers, a program Hydro One has expanded as described above; (ii) that Hydro One meet with the large industrial customers of other LDCs, with Hydro One executives responding to customer concerns. Hydro One executed this suggestion and will facilitate future meetings as requested by LDCs; and (iii) that Hydro One may review LDC survey information. As indicated

above, Hydro One considered the results of other LDCs customer surveys during its investment planning process.

**FINDING 3: INCORPORATE INPUT FROM FIRST NATION REPRESENTATIVES**

As noted, one message that Hydro One heard in the last transmission rate proceeding was that First Nations customers were not effectively represented in Hydro One's transmission customer engagement process, nor was any particular process in place to specifically engage with these customers. To respond to this concern, Hydro One asked LDC customers who serve First Nations communities whether there was anything in particular they felt Hydro One could do to better serve the specific needs of First Nations and Métis communities. Hydro One also leveraged its ongoing engagement activities with First Nations and Metis communities to identify customer needs and preferences for these customers. Details of Hydro One's ongoing initiatives can be found in Exhibit A, Tab 7, Schedule 2.

**FINDING 4: ENSURE INFORMATION PRESENTED TO CUSTOMERS IS EASY TO UNDERSTAND**

Finally, the design of the 2017 engagement survey included information that was purposefully written to ensure the content was unambiguous, sufficiently informative for customers to respond to, and easy for customers to understand. To gauge the quality and clarity of the information, the survey included a post-survey question asking "Did Hydro One provide too much information, not enough or just the right amount?" The result was that 76% of respondents believed the survey contained just the right amount of information.

**Stakeholder Session**

A stakeholder session, which included OEB staff and interveners who participated in prior Hydro One transmission rate proceedings, was held on March 22, 2017. The

session aimed at gathering thoughts and insights from stakeholders on Hydro One's prior customer engagement activities. The feedback provided during this session was addressed as part of the 2017 Transmission Customer Engagement Survey process, as summarized in Table 1 below.

**Table 1 - Summary of Feedback Received by OEB Staff and Interveners and Hydro One's Actions Taken**

| Feedback Received | Action Taken |
|---|---|
| Consultation did not take place early enough to have impacted business decisions. | The 2017 Transmission Customer Engagement report was released to Hydro One planners in 2017 and was incorporated into the iterative planning process undertaking in 2018. |
| Participation rates were low in the 2016 Transmission Customer Engagement effort, and did not represent the ones who will feel the impact of an increase (i.e., end-users of LDCs). | Hydro One invited all transmission customers to participate in the survey via a variety of channels. For the 2017 survey, 103 of 153 customers, or 66% of Hydro One transmission-connected customers, participated in the survey including a large number of LDCs. |
| A subset of the majority of attendees does not pay transmission rates directly and, therefore, Hydro One addressed the wrong audience. | A section for LDCs was added to the survey to address this concern, asking for the LDC's feedback to be provided on behalf of their customer base. |
| The costs of improved reliability and top quartile status were not fully explained to participants, impacting customer perception and whether they were willing to approve increased spending approvals. | A broader spectrum of options and enhanced details about each option were provided as part of investment outcomes. |
| There was a perceived endorsement of the middle investment scenario option and survey participants did not have enough options with 3 scenarios presented. | Customers were provided 4 detailed scenarios (as referenced in Attachment 1) and, when indicating their preference, were not constrained to choose one of the four scenarios, but rather respondents were asked to choose a point on a continuum (a total of 17 possible responses). |
| There was a perception that risks were exaggerated impacting customer perception to approve increased spending | IRG was asked to correct any wording used as part of the survey that could be perceived as 'leading' and additional information was provided in supplementary |

| Feedback Received | Action Taken |
|---|---|
| approvals, and that the risk model was not mature or predictive. | materials to better explain how and when the Hydro One Reliability Risk Model[4] is used. A broader spectrum of outcomes beyond reliability risk was provided to customers for each investment scenario to allow for more informed selections. |
| First Nations Customers were not represented and no consultation process was in place. | Hydro One engages with First Nation customers on a regular basis through a variety of channels (as outlined in Exhibit A, Tab 7, Schedule 2). Although Hydro One has no First Nation transmission customers, LDCs who serve First Nations and Métis Nation customers were asked specifically to provide feedback on how Hydro One could improve service to these customer segments. Of the LDC customers served by Hydro One who self-identified as serving First Nations and Métis communities, two provided a response. One indicated that Hydro One did not need to do anything else. The other stated that, "The northern single circuit communities deserve more attention as they are more vulnerable in terms of supply and outage response." This feedback was considered when assessing the overall pool of investments addressing lower performing sections of the transmission system. Hydro One actively monitors all customer delivery point performance and invests in the system to address customer power quality concerns. Significant investment is planned in wood pole replacements, where the majority of the asset population is located in northern Ontario, along with transmission line refurbishments to address poor condition assets that pose a high risk to customer reliability. |
| Customers may not have fully understood what was being asked of them. | Links were included in the survey that took customers to a second document with more contextual information and definitions of terms used in support of the survey. |
| Confusing terms were used by Hydro One as part of the survey with terms used interchangeably, confusing customers (outage, interruption, end of useful life, expected service life, etc.). | The survey was carefully developed to be consistent with the use of terms throughout the survey process. Clarity on terms was provided in the supporting materials described above. |

[4] Further details regarding the reliability risk model are provided in Attachment 4.

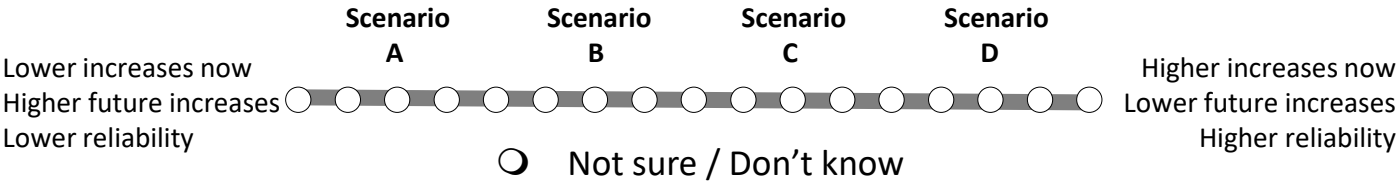
An additional discussion on end-user customers is presented in TSP Section 1.5.2, *Responses to OEB Directions from EB-2016-0160, LCD End-User Satisfaction.*

The presentation slides and summary notes from this stakeholder session are provided as Attachments 2 and 3 to this section of the TSP.

| | Illustrative Scenarios | | | |
|---|---|---|---|---|
| | **A: Limited investment** | **B: Decrease in current level of investment** | **C: Maintain current level of investment** | **D: Increase beyond the current level of investment** |
| **5 Year Capital Investment 🕮** | $1.8 B | $4.3 B | $6.6 B | $7.4 B |
| **Reliability Risk🕮** | Increase in risk ~30% | Increase in risk ~10% | Decrease in risk ~10% | Decrease in risk ~15% |
| **Long-term Reliability Impact** | ↓ | ↓ | ↑ | ↑* |
| **Average Percentage of Key Assets Beyond Expected Service Life 🕮 by end of 2023 (21% in 2019)** | 29% | 26% | 19% | 17% |
| **Impact on Future rates** | Significantly higher future rate increases | Higher future rate increases | Level future rate increases. | Slightly lower future rate increases. |
| **Average Annual Total Bill Impact – Transmission Connected Customer** | 0.11% | 0.27% | 0.42% | 0.46% |
| **Average Annual Transmission Rate Increase** | 1.30% | 3.30% | 5.10% | 5.60% |

* Improvement in overall long term reliability and significant performance improvement for small number of customers connected to the worst performing circuits.

Thinking of all the considerations outlined, please choose a point along the line below that you believe strikes the right balance between rates and outcomes. (Remember you can choose a point located between scenarios or directly aligned with them).




❍ Not sure / Don't know

**Comments:** Please use this space to tell us why you placed the slider where you did.

# Survey Methodology

**Overview:**
Innovative Research Group (INNOVATIVE) was commissioned by Hydro One to conduct a customer engagement survey with its 156 transmission customers. INNOVATIVE worked closely with Hydro One to ensure that the survey structure and all questions were methodologically sound and that all data was collected in a private and secure manner. The results of the survey will be used as input for Hydro One's 2019 to 2023 business plan.

**Sample Frame:**
Hydro One and INNOVATIVE made efforts to contact all 156 Hydro One transmission customers to participate in this engagement (see details below). From a list of 156 customers, a total of 103 completed the survey.

**Methodology:**
In order to meet the needs of senior executives, customers were given the option of participating online on a custom site created and hosted by INNOVATIVE, or through an in-person or telephone interview with a senior INNOVATIVE consultant. While most customers chose to use the online tools, one customer requested an in-person interview and three opted for a telephone interview.

The survey design kept the amount of background information to a minimum in recognition of the high level of electricity system knowledge of many participants. To assist customers who are less engaged in the system, additional information (see Appendix 1.3) was made available to all survey participants, either with "click to access" buttons throughout the online survey, or in a standalone document for those who completed an in-person or telephone interview.

Where possible, invitations were initially extended through a phone call from Hydro One account executives and INNOVATIVE researchers. Most (n=142) customers were successfully contacted by phone and all but nine of this group (who stated they were not interested) were subsequently sent an email from INNOVATIVE which contained an individual URL for the survey site. Twelve customers who were not reached by phone were sent an email invitation which included a direct link to the online survey, along with contact details for an INNOVATIVE consultant should they wish to do an in-person or telephone interview. There were only two customers who could not be reached by email or by telephone.

**Field Dates:**
May 11th to June 15th, 2017

# Making Choices: Pace of Investment

When Hydro One replaces equipment in declining health, it has some flexibility in its pacing. **For more information on the health of Hydro One's assets, See the "Additional Information" document**

We would like to understand your general views on the appropriate pacing of Hydro One's investments over the next 15 – 20 years. Hydro One can front load its capital investments, it can spread them evenly over time, or it can delay its investments.

Front-loading investments would provide some benefits in terms of more connection capacity 🕮, decreased equipment failures, increased reliability, and improved productivity and quality. This would mean higher rate increases now but lower rate increases in the future.

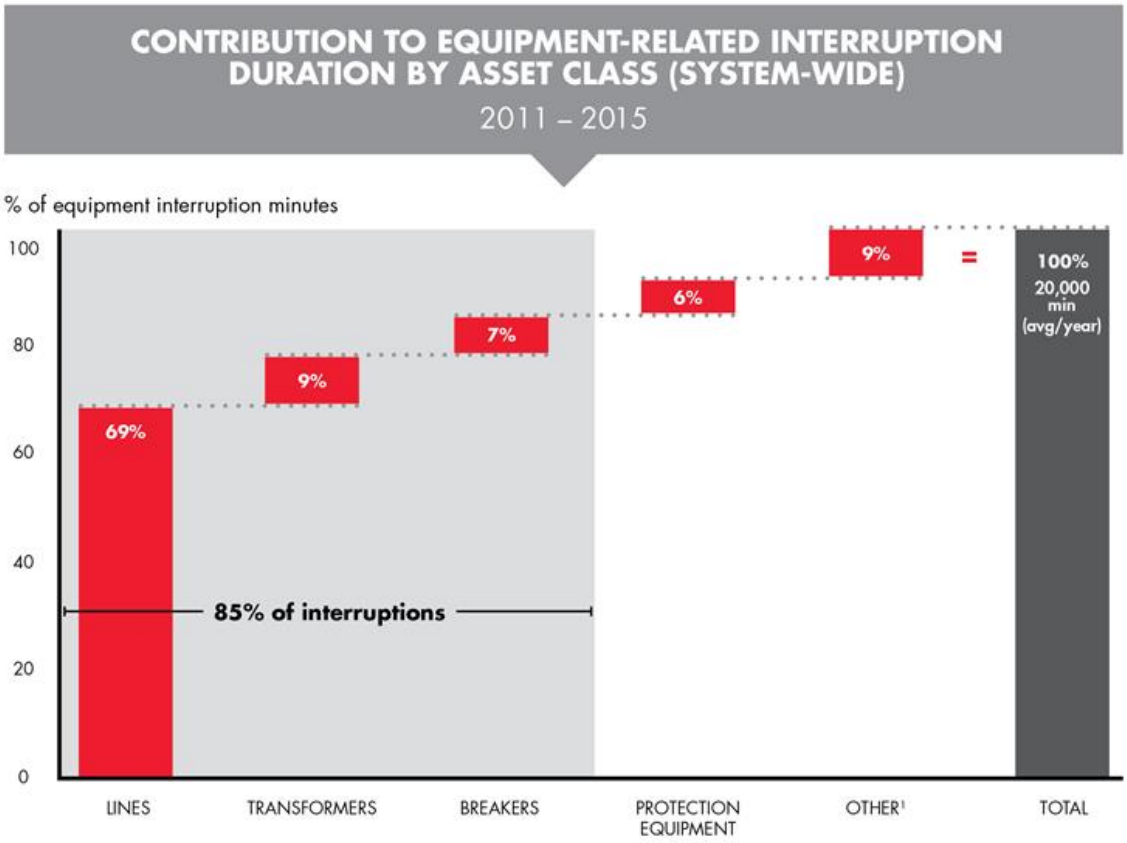
Spreading evenly over time means some benefits are delayed but some long term savings are secured and it is more efficient in terms of staffing. Rate increases would increase at a stable level. Asset deployment costs would likely be lower using this more stable pacing philosophy.

Given the current health and demographics of the system, Hydro One can delay investments further until declining equipment conditions threaten Hydro One's ability to meet power reliability requirements. Reliability would still meet minimum standards but customers would likely experience more interruptions 🕮 than today. Rates increases would be relatively low for several years but increase at a steeper rate in the future.

## Hydro One System's Asset Health

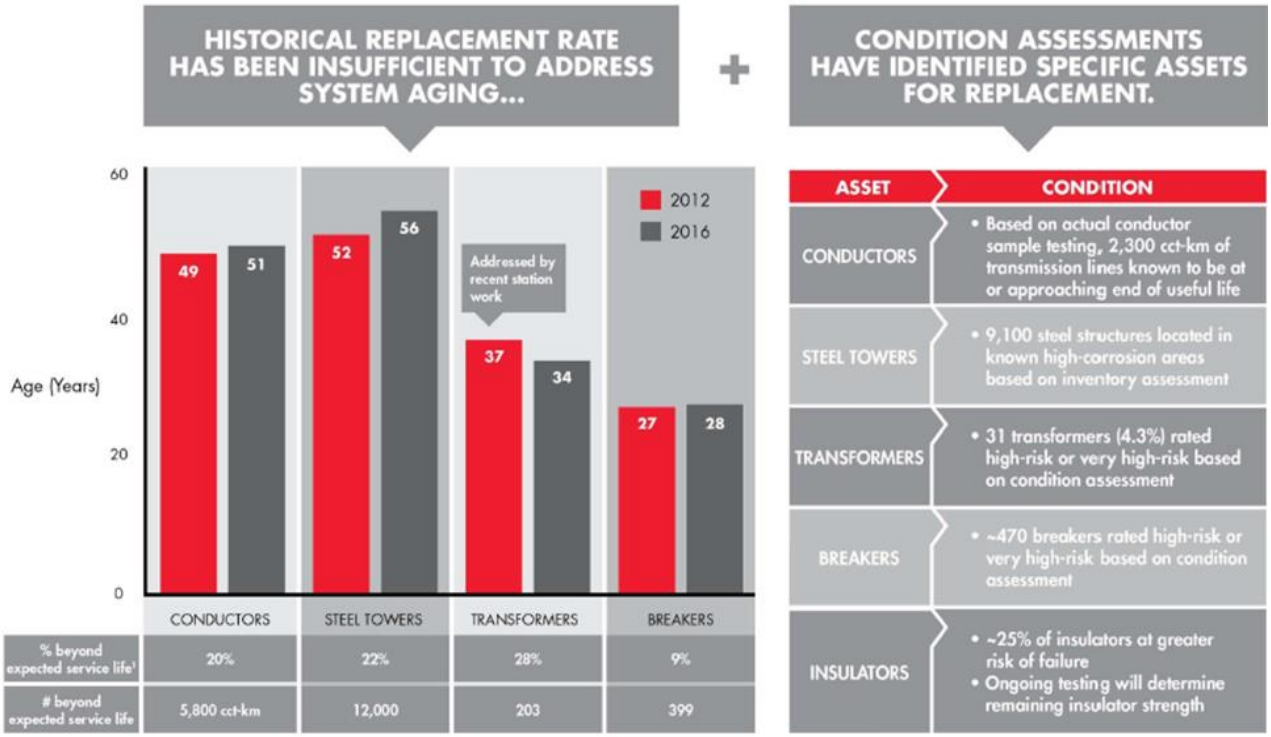
As the system ages, so do critical assets, resulting in equipment failures and sometimes in power interruptions.

While transmission lines are the primary cause of equipment-related interruptions, transmission lines, transformers and breakers combined accounted for 85% of system interruptions between 2011 and 2015.




1. Other includes switches, instrument transformers, surge arrestors, system auxiliaries

As of 2016, at least one-in-five conductors (19%), steel towers (22%) and transformers (28%) are beyond their expected service life. This translates into 5,800 circuit-kilometers of lines, 12,000 steel towers and 203 transformers. Many of these assets are already planned for replacement, but other assets continue to age beyond their expected service life.




1. The average time in years that an asset can be expected to operate under normal system conditions.

**Asset Demographics**

Hydro One only replaces assets that are in poor condition. The condition is determined through inspection and testing. However, a driving factor of equipment condition is age and equipment is more likely to require replacement as it ages.

The figures below show the number of units of each key asset (transformers, breakers and conductors) that has been put in to service since the 1930s. The figures show that a large number of key assets were put in to service between the mid-60s through to the mid-70s. In the next 10 years, those assets, representing a significant portion of Hydro One's total assets, will likely require replacement.

A sizable portion of each critical asset class is operating beyond expected service life.

Specifically, 28% of transformers, 9% of breakers and 19% of conductors are currently operating beyond their normal expected service lives.

Hydro One's approach to asset management for its transmission line assets is shaped by the nature of the specific line assets and their typical service lives. For example, the expected service life for overhead transmission conductors is 90 years, though the conductor may reach end of life before or after that time depending on the specific environmental circumstances. When a conductor fails or has been determined to have reached end of life based on its condition, as confirmed by testing, replacement is the only solution. When the conductor needs replacement, this creates a rare opportunity in the asset lifecycle for Hydro One to implement a full line refurbishment of the relevant segment in order to bring the associated assets (i.e., poles, parts of steel structures, foundations and the conductors) to a condition that is as close to new as possible. Other transmission line components (e.g., wood poles, shield wire, aviation lighting and U-bolts) do not last this long and as such are subject to separate, recurring asset replacement programs. Regardless of the type of transmission line asset, Hydro One will not replace assets unless their condition warrants the replacement.

## B CUSTOMER NEEDS

Hydro One believes that understanding its customers, and their needs, is critical to its business. Hydro One engages with customers proactively and regularly through various mechanisms. Customer needs can be categorized as either (i) initial connection needs, or (ii) needs of connected customers. Initial connection needs are generally identified either by a direct customer connection request through the Hydro One customer connection process or by need assessments and customer consultations as part of the Regional Planning process. Once connected, customer needs are identified by continuous monitoring of the power system and engagement with transmission customers.

## C CUSTOMER ENGAGEMENT

Hydro One's senior management team has renewed the company's focus on customer relationships. As described in TSP Section 1.3, in addition to regular customer engagement, Hydro One commissioned Innovative Research Group ("Innovative") to

conduct a customer engagement survey (the "Customer Survey") with 156 transmission customers in May and June 2017. The results of this survey have been used as an input to this TSP.

Through its customer engagement efforts, Hydro One learned the following:

- Safety, reliability, and environment are among the top prioritized outcomes;
- Customers' reliability requirements differ. While some process-oriented industrial customers may prefer reducing the frequency of outages over duration, non-industrial customers may prefer multiple shorter duration outages;
- All customer segments prefer the even pacing of investments over time to achieve a gradual and uniform impact on rates; and
- When presented with several investment scenarios, the majority of customers preferred investment levels in line with the investment plan that was before the OEB in the prior transmission proceeding by at least a three to one margin. It is seen as reflective of the current approach which has served the system well, and a less risky option.

In developing the improved taxonomies **(**as explained in TSP Section 2.1.4 below), Hydro One considered specific customer feedback and added outage frequency to the probability framework to incorporate specific feedback from customers. Over 80% of customers surveyed identified safety, reliability, or environmental considerations as high priority items (seven or higher on a scale of ten). The details of how Hydro One incorporated customers' feedback into its investment plan are included in TSP Sections 2.1.4 and 3.2.1.3.

## D SYSTEM NEEDS

System needs cover work necessary to ensure that the transmission system is maintained and operated to provide an adequate and reliable supply to customers. They are driven by

- Challenge sessions to engage stakeholders across the organization to review the investments and discuss potential trade-offs.

The improved risk assessment process relies primarily on three risk taxonomies that have been developed to classify safety, reliability and environmental risks. The taxonomies provide guidelines for planners to assess the consequence and probability of existing operational risks and the residual risks remaining based on how investment projects are expected to mitigate those risks. The taxonomies are fact-based, with significant analytical rigor behind the development of different levels of classification. For example, different levels of safety consequence are based on historical data of safety outcomes derived from utility industry experience. Reliability consequence information is based on realistic customer outcomes for escalating levels of consequence based on Hydro One's experience.

Hydro One's improved risk assessment method enables it to incorporate key customer and regulatory outcomes into its evaluation of projects in two ways. The first is through the definitions of consequence in the risk taxonomies, and the second is through the flagging system (described in more detail below). Hydro One's risk taxonomies are based on key outcomes (safety, reliability, and environment)[2] that customers and the OEB have identified as high priority. These outcomes are reflective of top customer priorities identified through Hydro One's customer engagement, detailed in TSP Section 1.3, and align with key regulatory and policy concerns (e.g., reducing GHG emissions, ensuring public safety). Through multi-level, executive reviews, Hydro One continuously monitors the alignment of investment drivers with identified customer needs and preferences.

[2] Reliability consequences can be classified in terms of unsupplied energy, load impacted and minutes of interruption duration. Environmental consequences can be classified in terms of overall impact to the environment, oil spill severity and greenhouse gas emissions. Safety consequences can be classified in terms of harm to employees or the public.

INNOVATIVE RESEARCH GROUP

# 2018 Large Tx Customer Satisfaction

## Understanding Dimensions of Satisfaction and Dissatisfaction

**Hydro One**
**483 Bay Street**
**Toronto, ON  M5G 2P5**

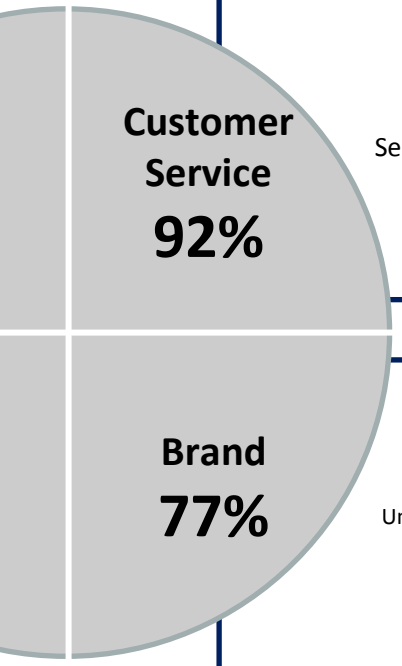
hydro one

**October 2018 :: Review Draft**

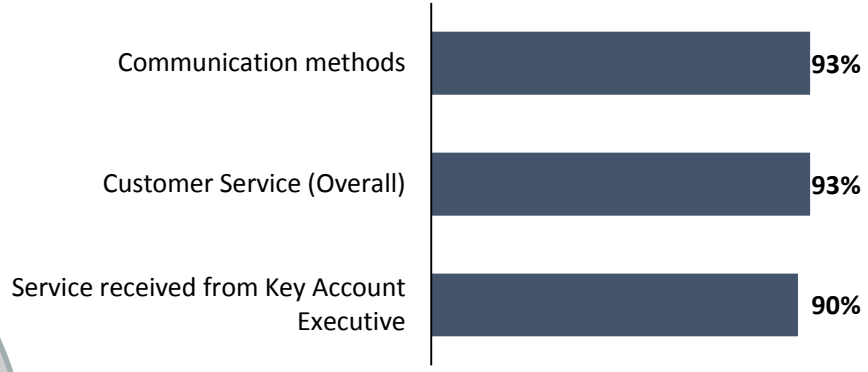
# Survey Findings: Dimensions of Satisfaction (LTX – All Segments)

## Price/Billing

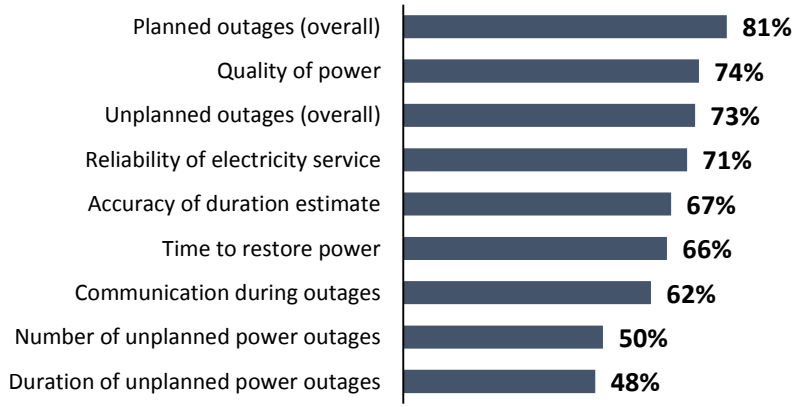
*No price/billing questions pertaining to experience with Hydro One were asked of LTX customers*




## Customer Service




## Product Quality/Reliability




## Brand


**NOTE**: Percentages represent total satisfied (very and somewhat satisfied)
Response "Don't know" was included in this analysis.