

1                   **A - DISTRIBUTED RESOURCE COALITION INTERROGATORY - 001**

2  
3                   **Reference:**

4                   Exhibit A-3-1, Page 21-22

5  
6                   **Preamble:**

7                   HONI's business plan notes that one of the key drivers of its investment plan is the need to  
8                   integrate distributed energy resource ("DERs").

9  
10                  **Interrogatory:**

- 11                  a) Please provide any and all analysis, reports, studies, presentations, data or other  
12                  documentation with respect to past and forecast (2020-2027) DER uptake in HONI's service  
13                  territory.  
14  
15                  b) Please indicate whether HONI considers Electric Vehicles ("EVs") to be DERs and discuss the  
16                  related implications for HONI's distribution system and system capacity.  
17  
18                  c) Please provide any and all analysis, reports, studies, presentations, data or other  
19                  documentation with respect integrating DERs as a driver HONI's investment plan.  
20

21                  **Response:**

- 22                  a) On its face, this request is unreasonably broad and burdensome, and goes beyond seeking  
23                  information that would be relevant to matters at issue in the proceeding. The relevance of  
24                  the requested information, in respect of advancing the OEB's consideration and  
25                  determination of rates in this proceeding, is not clear. Hydro One therefore declines to  
26                  provide the requested information. Hydro One nevertheless notes that its evidence regarding  
27                  past and forecast DER uptake in its service territory can be found in Exhibit B-3-1, section 3.4,  
28                  and additional information on forecast renewable and non-renewable DER activity is provided  
29                  in Interrogatory Response B3-PP-016 (a).  
30  
31                  b) Hydro One considers EVs to be energy source DERs when they have capability to export  
32                  energy from the vehicle to grid via a bi-directional charger, even if they do not export past the  
33                  meter. The connection of this type of equipment can have equal impact to the distribution  
34                  system as any other type of embedded generation facility, and are thereby covered by  
35                  sections 2.3.6 and 3.4 of Hydro One's Conditions of Service. EV assessment from a loading  
36                  perspective is actively being evaluated. The EV penetration rate is not yet significant and is  
37                  estimated to be between 1% and 2% in Hydro One's service territory. Hydro One is proactively

- 1           working on assessing the overall impact of integrating EVs into the system and the best  
2           approach to minimize future upgrade costs to rate payers.  
3  
4       c) See response to (a), above. In addition, Hydro One notes that Exhibit B-3-1, section 3.4 of its  
5           pre-filed evidence outlines Hydro One's investment plan for the integration of future DER  
6           requests made to Hydro One by third-parties.

1                   **A - DISTRIBUTED RESOURCE COALITION INTERROGATORY - 002**

2  
3                   **Reference:**

4                   Exhibit A-3-1, Attachment 1, Page 46

5  
6                   **Preamble:**

7                   HONI indicates that it is seeking to transition its commercial fleet to low or zero emission  
8                   technology, including increasing the rate of EVs from an estimated 5 percent of the renewal  
9                   forecast in 2020 to 45 percent by 2030.

10  
11                   **Interrogatory:**

- 12                   a) The federal government provides financial incentives for qualified zero emission vehicles  
13                   purchased or enhanced capital cost allowance deductions.  
14                   i. Please advise whether HONI's planned fleet renewal investments qualify for the federal  
15                   financial incentives and/or enhanced capital cost allowance deductions.

16  
17                   Please advise whether the capital expenditure figures reported reflect federal financial  
18                   incentives and/or enhanced capital cost allowance deductions.

- 19  
20                   b) Please complete the following chart indicating the breakdown of vehicle type in HONI's  
21                   current vehicle fleet:

Vehicle Type	Fully Electric	Hybrid	Non-EV/Hybrid	Total
Heavy Duty Vehicles				
Medium Duty Vehicles				
Light Duty Vehicles				

- 22  
23                   c) What proportion of HONI's planned fleet renewal investment will involve fully electric and/or  
24                   hybrid vehicles? Please complete the following chart indicating HONI's anticipated  
25                   breakdown of vehicle type in HONI's planned fleet renewal investment (2022 to 2027):

Vehicle Type	Fully Electric	Hybrid	Non-EV/Hybrid	2022-2027 Total
Heavy Duty Vehicles				
Medium Duty Vehicles				
Light Duty Vehicles				

1

2 d) Please indicate the estimated quantum of efficiency savings (including fuel cost savings) that  
 3 HONI anticipates it will achieve by utilizing hybrid vehicles and EVs rather than traditional  
 4 internal combustion engine vehicles.

5

6 **Response:**

7 Please refer to interrogatory B4-Staff-157 for a clarification to GSP Section 4.1, Page 16, lines 19  
 8 to 22.

9

- 10 a) i. Yes, where corporations qualify  
 11 ii. Yes

12

13 b) YE Forecast for 2021

Vehicle Type	Fully Electric	Hybrid	Non-EV/Hybrid	Total
Heavy Duty Vehicles	0	3	1437	1440
Medium Duty Vehicles	0	0	1398	1398
Light Duty Vehicles	17	43	1260	1320

14

15 c)

Vehicle Type	Fully Electric	Hybrid	Non-EV/Hybrid	2022-2027 Total
Heavy Duty Vehicles	16	44	1380	1440
Medium Duty Vehicles	25	186	1187	1398
Light Duty Vehicles	215	450	655	1320

- 1 d) For 2022 to 2027 Hydro One is forecasting 2.3M liters offset and a fuel cost savings of \$2.7M
- 2 based on a fuel price of \$1.15/L assumption.

Filed: 2021-11-29  
EB-2021-0110  
Exhibit I  
Tab 7  
Schedule A-DRC-002  
Page 4 of 4

1

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Witness: BERARDI Rob

1                   **A - DISTRIBUTED RESOURCE COALITION INTERROGATORY - 003**

2  
3                   **Reference:**

4                   Exhibit A-6-6, Attachment 1

5  
6                   **Preamble:**

7                   HONI notes that through its Ivy Charging Network, a partnership with Ontario Power Generation,  
8                   it is expected to have 73 fast-charger stations across Ontario by the end of 2021.

9  
10                  **Interrogatory:**

11                  a) Please provide estimates for the expected number of fast-charging stations across Ontario for  
12                  each year between 2022 and 2027.

13  
14                  b) Please provide any and all reports, working papers, analysis or other materials that have been  
15                  prepared (in draft or in final form) in connection with the Ivy Charging Network.

16  
17                  **Response:**

18                  Please note that the Ivy Charging Network is a limited partnership between Hydro One Ltd. and  
19                  Ontario Power Generation and is held as an unregulated business, which is outside of the scope  
20                  of this proceeding.

Filed: 2021-11-29  
EB-2021-0110  
Exhibit I  
Tab 7  
Schedule A-DRC-003  
Page 2 of 2

1

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Witness: JESUS Bruno



1                   **A - DISTRIBUTED RESOURCE COALITION INTERROGATORY - 004**

2  
3                   **Reference:**

4                   Exhibit A-7-1, Attachment 2, Page 3

5  
6                   **Preamble:**

7                   HONI's five-year investment plan includes installing innovative energy battery and storage  
8                   solutions to provide improved resiliency for customers by 60%.

9  
10                  **Interrogatory:**

11                  a) Please indicate what Exhibit B investments will provide for the installation of the above-  
12                  mentioned DERs solutions.

13  
14                  b) Please indicate whether HONI considers EVs to be part of the above-mentioned DERs  
15                  solutions.

16  
17                  c) Please provide any and all analysis HONI undertook to arrive at the 60% improved resiliency  
18                  figure. Please provide HONI's definition of "resiliency" as it related to installing energy battery  
19                  and storage solutions.

20  
21                  **Response:**

22                  a) See ISD D-SS-04: Energy Storage Solutions.

23  
24                  b) Electric vehicles are not a part of the DER solutions outlined in ISD D-SS-04: Energy Storage  
25                  Solutions.

26  
27                  c) Battery storage can be scaled to fit the reliability needs of a specific area or customer, with  
28                  solutions varying from the installation of residential storage batteries in a residential  
29                  customer's home, to grid-scale battery energy storage systems that can back up a whole  
30                  community and reduce the outage duration experienced by the target customers.

31  
32                      a. For grid-scale storage, the anticipated reliability improvement is approximately 60%  
33                      based on the Aroland BESS pilot project. The improvement was calculated based on the  
34                      energy requirements of the community during each historical outage along with the  
35                      outage length.

1           b. For residential storage, the anticipated reliability improvement is approximately 60%  
2           based on the Residential Storage pilot project. The forecasted reliability improvement  
3           was calculated using the historical outage length and average peak energy consumption  
4           of the target customers.

5

6           Further to the descriptions above, reliability is quantitative metric for the duration of time a  
7           customer is without power. Resiliency is a qualitative metric that describes the capability of  
8           the grid to restore power when an outage occurs. As examples, resiliency can be achieved  
9           through protection (sectionalization), backfeeding through feeder ties, or via temporary  
10          sources of power such as backup generators or energy storage.

1                   **A - DISTRIBUTED RESOURCE COALITION INTERROGATORY - 005**

2

3                   **Reference:**

4                   Exhibit A-4-1

5

6                   **Preamble:**

7                   HONI is proposing that OM&A costs in years two through five of its rate term be adjusted by a  
8                   Revenue Cap Index ("**RCI**"), on an annual basis, as follows:

9   **RCI = I – X + C**

10                   where,

- 11                   • "I" is the inflation factor;
- 12                   • "X" is the productivity factor;
- 13                   • "C" is HONI's custom capital factor reduced by a supplemental stretch factor on capital of  
14                    0.15%

15

16                   **Interrogatory:**

- 17                   a) Please outline HONI's assumptions in the "X" productivity factor in the above RCI equation  
18                   regarding capacity, load changes, and leveraging due to EVs and other DERs in each of years  
19                   two through five.  
20
- 21                   b) Please outline HONI's assumptions in the "C" term in the above RCI equation regarding  
22                   capacity, load changes, and leveraging of EVs and other DERs in each of years two through  
23                   five.  
24
- 25                   c) How were each of DERs, EVs, and EV charging infrastructure treated for the purpose of setting  
26                   the "I" factor at which HONI arrived? Please provide all related working papers.  
27

27

28                   **Response:**

- 29                   a) The "X" productivity factor in the RCI equation is the sum of two productivity factors: a base  
30                   productivity factor which represents long-term industry productivity trend and a stretch  
31                   factor which reflects the results of an independent total cost benchmarking study conducted  
32                   by Clearspring which is provided in Attachment 1 to Exhibit A-4-1. The benchmarking analyses  
33                   are based on overall cost and load data of the utilities in the sample, including Hydro One.  
34                   Capacity, load changes, and leveraging of EVs and other DERs are implicitly considered  
35                   through the input data used for the benchmarking analysis.

Witness: VETSIS Stephen, ALAGHEBAND Bijan

- 1 b) The "C" capital factor is designed to ensure that the total revenue resulting from the Custom  
2 IR approach is appropriate for Hydro One's specific circumstances and will support the  
3 necessary capital investments in Hydro One's system plans. Details on Hydro One's capital  
4 investments are provided in Hydro One's System Plan Framework (B-1-1), TSP (Exhibit B-2-1),  
5 DSP (Exhibit B-3-1) and GSP (Exhibit B-4-1). The capital factor reflects capacity, load changes  
6 and leveraging of EVs and other DERs to the extent that these are drivers for the specific  
7 investments proposed in Hydro One's system plans.  
8
- 9 c) The "I" inflation factor is based on the weighted average of the annual percent change of a  
10 Statistics Canada labour and non-labour index, as established in OEB policy. DERs, EVs and EV  
11 charging infrastructure are reflected in the inflation factor to the extent they are implicitly  
12 reflected in the broader economic trends captured by these indices.

1                   **A - DISTRIBUTED RESOURCE COALITION INTERROGATORY - 006**

2  
3                   **Reference:**

4                   Exhibit A-3-1, Attachment 1

5  
6                   **Preamble:**

7                   HONI indicates that its load and customer forecast methodology uses well-established industry  
8                   practices and methods, such as econometric and end-use models, Conservation and Demand  
9                   Management (“**CDM**”) inputs from the Independent Electricity System Operator (“**IESO**”), and  
10                  customer forecast surveys.

11  
12                  **Interrogatory:**

- 13                  a) Please discuss whether HONI’s load forecast considers the impact and integration of EVs and  
14                  EV charging infrastructure and provide any and all related analysis, working papers, and/or  
15                  reports.
- 16  
17                  b) Please provide, in the chart format below, an assessment of the impacts on loads and  
18                  demands — including the load forecast — of HONI’s estimate of EVs and distributed  
19                  generation in each year and any supporting references.

20

	2023	2024	2025	2026	2027
EVs (number, kW or kWh)					
EV charging infrastructure (number, kW or kWh)					
Distributed Generation (number, type, kW or kWh)					
etc.					

- 21  
22                  c) The Government of Canada has set a mandatory target for all new light-duty cars and  
23                  passenger trucks to be zero-emission by 2035. In the *Made-in-Ontario Environment Plan* (the  
24                  “**Environment Plan**”) the Ministry of Environment, Conservation and Parks estimates that  
25                  16% of targeted greenhouse gas emissions reductions will come from low-carbon vehicles  
26                  (i.e., primarily EV adoption). Please indicate:

- 27  
28                          i. whether HONI’s assumptions regarding EVs and greenhouse gas emissions reductions  
29                          resulting from EVs in its service territory are consistent with these federal and  
30                          provincial policies;

- 1           ii. if not, what are HONI's assumptions;  
2  
3           iii. whether HONI has altered its perceived impact of EV adoption on load forecasts in  
4           light of the federal target or Environment Plan or any other federal or provincial plan  
5           or program, including proposed green stimulus programs following the COVID-19  
6           pandemic;  
7  
8           iv. whether HONI will update its overall demand assumptions and EV related  
9           assumptions in light of  
10           a. the federal target;  
11           b. the Environment Plan;  
12           c. any other federal or provincial plan or program, including proposed green  
13           stimulus programs following the COVID-19 pandemic;  
14  
15           v. what are the estimated total and annual capital expenditures and operating  
16           expenditures regarding EV charging infrastructure that HONI has included in the  
17           Application during the 2023-2027 period; and  
18  
19           vi. what capital expenditure and operating expenditure funding (federal, provincial, or  
20           otherwise) is available to HONI specific to EVs and DERs.  
21

22           **Response:**

- 23           a) Yes, Hydro One's load forecast considers the impact and integration of EVs. Please see  
24           response to D-Staff-190.  
25  
26           b) Please see response to D-Staff-190.  
27  
28           c)  
29           i - iv Please see response to D-Staff-190.  
30  
31           v. There are no annual capital expenditures or operating expenditures specifically  
32           associated with EV charging infrastructure included in the Distribution System Plan.  
33  
34           Regarding investments by Facilities and Real Estate to install new EV charging  
35           infrastructure to support the roll out of electric vehicles at Hydro One sites, please  
36           refer to B3-ED-24.

1 vi. Funding sources include those listed below.

2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13

- **Grid Innovation Fund (GIF):**

The Independent Electricity System Operator (IESO) offers financial support for innovative projects through its Grid Innovation Fund (GIF). The GIF invests in projects that accelerate the adoption of cost-effective energy solutions, such as ones that increase understanding of DER capabilities and evaluate the potential of EV integration within the distribution system.

- **Natural Resources Canada (NRCan):**

Natural Resources Canada (NRCan) provides financial support for smart renewable energy and electrical grid modernization projects, including emerging technologies such as energy storage.

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1                   **B1 - DISTRIBUTED RESOURCE COALITION INTERROGATORY - 007**

2  
3                   **Reference:**

4                   Exhibit B-1-1, SPF Section 1.6

5  
6                   **Preamble:**

7                   HONI engaged Innovative Research Group Inc. (“**IRG**”) to assist in meeting HONI’s customer  
8                   engagement commitments and develop a comprehensive customer engagement study. The work  
9                   was carried out in two phases. The first phase engaged customers at the beginning of the  
10                  investment planning process. During the second phase, customers were again engaged after draft  
11                  investment plans were prepared

12  
13                  **Interrogatory:**

- 14                  a) Please provide a copy of all written instructions provided by HONI to IRG in relation to IRG’s  
15                  customer engagement mandate for the Application and the reports provided in Exhibit B, Tab  
16                  1, Schedule 1, Section 1.6, Attachments 2-7.
- 17  
18                  b) Please provide a copy of all written instructions provided by HONI to IRG in relation to  
19                  customer engagement with respect to consumer choice in integrating new technologies like  
20                  DERs, EVs, solar power, and battery storage.
- 21  
22                  c) Please describe all measures undertaken by HONI and IRG to invite and ensure the  
23                  participation of EV stakeholders and other DER customers (including EV drivers, owners of  
24                  DERs, EV associations, and DER industry associations) in customer engagement activities.
- 25  
26                  d) Please provide any and all notes from IRG’s customer engagement relating to EVs/DERs that  
27                  are supplementary to the reports provided in Exhibit B, Tab 1, Schedule 1, Section 1.6,  
28                  Attachments 2-7.

29  
30                  **Response:**

- 31                  a) For correspondence related to third-party reports included in the application please refer to  
32                  interrogatory response B1-SEC-048.
- 33  
34                  b) There were no written instructions provided by HONI to IRG in relation to customer  
35                  engagement with respect to consumer choice in integrating new technologies like DERs, EVs,  
36                  solar power, and battery storage.

Witness: GILL Spencer

- 1 c) The approach taken by HONI and IRG was an open and transparent process that sought input  
2 from all customers, including those of other local distribution companies, municipalities, First  
3 Nations communities, and a wide range of stakeholders throughout the engagement process.  
4 HONI and IRG encouraged broad participation through various channels, such as email, direct  
5 mail, digital and social media, as well as traditional media.  
6
- 7 d) During Phase 1 of the customer engagement, customers were asked to rate their outcome  
8 priorities. One of the priorities was “Enabling customer choice to access new electricity  
9 services (e.g. electricity storage)”. Customers also had the opportunity to mention priorities  
10 that were not included in the list. Please refer to Attachment 1 for the Phase I: Online  
11 Workbook Report for Distribution System, as well as attachments provided in B1-Anwaatin-  
12 002

# 2023-2027 Customer Engagement Phase I: Online Workbook Report for Distribution System (Residential and Business)



# About This Report



This report presents the results from the **online workbook** that was conducted among **distribution customers**, as part of Hydro One's Phase I customer engagement process for the 2023-2027 joint rate application.

The online workbook was customized for different customer types, and this report contains separate sections for each: Residential, Small Business (GS<50kW), Commercial & Industrial (GS 50kW-2MW), and Large Distribution Accounts (LDA).

To provide context to how customer feedback was collected, this report contains the original workbook pages used in the survey.

## Workbook Pages

Pages in this report that are taken from the online workbook are denoted by watermarked pages. Please note that some of these pages include graphs and charts; these do not represent data collected from the online survey, but were used to equip respondents with the facts and figures needed to form informed opinions.

The workbook pages in the results section are shown in the order they were presented to respondents.

## Results and Segmentation

The results are presented after the workbook page wherein a particular question was asked.

This report shows the overall results and detailed results by rate class and region. In the distribution report, these regions correspond to the planning regions used by Hydro One's distribution system planners.

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Residential



Small Business



Commercial &  
Industrial



Large Dx  
Accounts

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# Introduction

## Customer Engagement Methodology (Phase I)

### Hydro One's 2023-2027 Customer Engagement (Phase I)

Innovative Research Group Inc. (INNOVATIVE) was engaged by Hydro One Inc. (Hydro One) to assist in meeting Hydro One's customer engagement commitments under the *Renewed Regulatory Framework for Electricity Distributors*. The information contained within this report are the result of a series of customer engagements activities conducted between September 2019 and February 2020.

Hydro One is developing its joint rate application for the period covering the years 2023 to 2027, including both a consolidated Distribution System Plan and Transmission System Plan. Between September 2019 and February 2020, INNOVATIVE (on behalf of Hydro One) reached out to a range of Hydro One customers to identify customer needs and outcomes valued by customers.

Both distribution and transmission connected customers were invited to provide their feedback. Hydro One distribution customers—those who receive an electricity bill from Hydro One—had the opportunity to comment on both distribution and transmission related questions. Ontario ratepayers outside of Hydro One's distribution network were only presented with transmission related questions.

### Hydro One's Online Workbook (Phase I)

The main mode used to gather customer feedback was an online workbook. The first part of the workbook was designed to collect general customer needs and outcome preferences. The second part asked customers to provide their feedback on high-level investment trade-offs, covering distribution and transmission system examples. **This report covers only the distribution portion of the workbook. The transmission results are documented in a separate report.**

The goal of this first phase was to obtain feedback from a representative sample of customers and assess their needs and preferences. Only a random sub-sample of customers was invited to participate in this phase. All customers will have the opportunity to participate in Phase II.

All responses were collected using unique survey URLs which were sent directly to customers, using a Hydro One email address administered by INNOVATIVE. The online workbook was customized for different customer types. Separate versions were created for primary residential, seasonal residential, small business (GS<50 kW), and larger business accounts (GS>50 kW).

### Interpreting the Results

Links to the online workbook were distributed to customers with an email address on file. To ensure that these findings are representative of Hydro One's broader customer base, INNOVATIVE conducted a rigorous sample validation process. This process includes comparing the online sample to the broader sample on known variables, such as region and usage.

A telephone reference survey was also conducted to explore any differences in key attitudes and circumstances between the customers with email addresses and the customers without email addresses.

# Residential and Business Customers **Sample Validation**



# Sample Validation

## Overall Approach

Understanding the differences between customers with known email addresses (email sample) and the broader customer base is a critical first step for understanding how representative the email sample is of the broader customer base. Where significant differences exist between the two (e.g. demographics, firmographics, attitudes, and opinions), weights can be developed to minimize these differences.

INNOVATIVE undertook a rigorous “sample validation” process to understand whether and where differences existed between email sample and the broader customer base. This was done for all customer types with less than perfect email coverage, namely residential (both primary and seasonal), small business (GS>50kW), and C&I (GS 50kW<2mW). Email addresses were available for all larger distribution accounts (LDA).

For all customers types, except LDA, the sample validation process took place in two steps:

- 1. Comparing known sample variables:** Establishing an understanding of the difference between customers with known email addresses (email sample) and the broader customer base regarding known characteristics (rate class, region and consumption) is a critical first step in this process. *Those results are shared on pages 7 to 8.*
- 2. Telephone reference survey:** A short telephone “reference” survey was conducted to determine whether differences exist between the email sample and the broader customer base regarding demographics, firmographics, attitudes, and opinions. *Those results are shared on pages 10 to 25.*



# Sample Validation

## Coverage and Consumption Analysis

Comparing the email samples to the overall population in each rate class, we can see that the email samples are largely representative of the overall customer base with regard to consumption and regional distribution.

### Overall Email Coverage

Coverage is highest in the groups with higher usage, but even among the group with the lowest coverage, 44% of customers have an email on file.

Customer Type	Full Population	Email Coverage	
Primary Residential	1,070,319 records	522,120 records	49%
Seasonal Residential	144,489 records	63,765 records	44%
Small business (GS<50)	111,749 records	57,665 records	52%
C&I	7,891 records	6,176 records	79%
LDA	132 records	132 records	100%

### Average Electricity Consumption

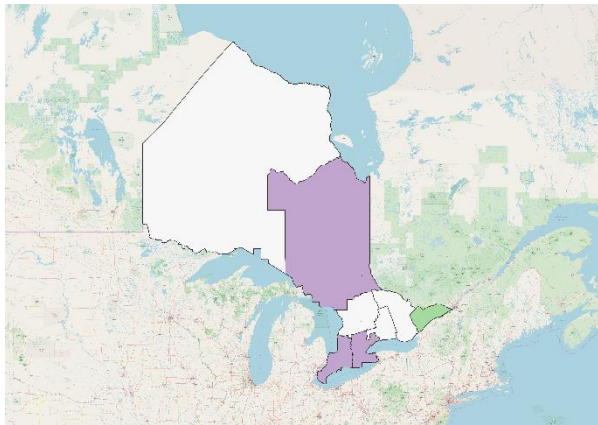
Across most rate classes, the sample of customers with email addresses on file use more power than the overall sample on average.

Customer Type	Full Population	Those with email addresses	Difference
Primary Residential	960 kWh	977 kWh	+2%
Seasonal Residential	1,001 kWh	1,170 kWh	+17%
Small business (GS<50)	2,298 kWh	2,550 kWh	+11%
C&I	192,938 kWh	235,260 kWh	+22%

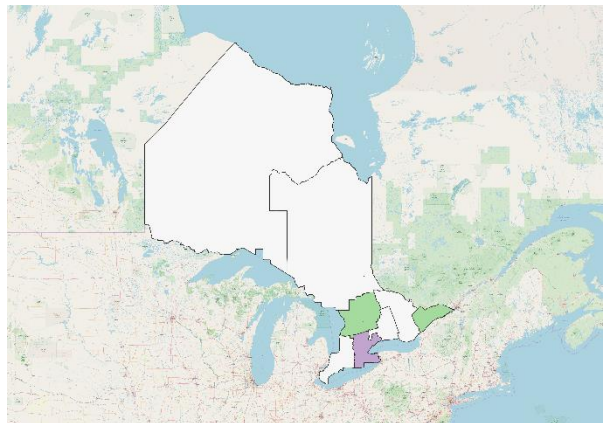
# Sample Validation

## Regional Analysis

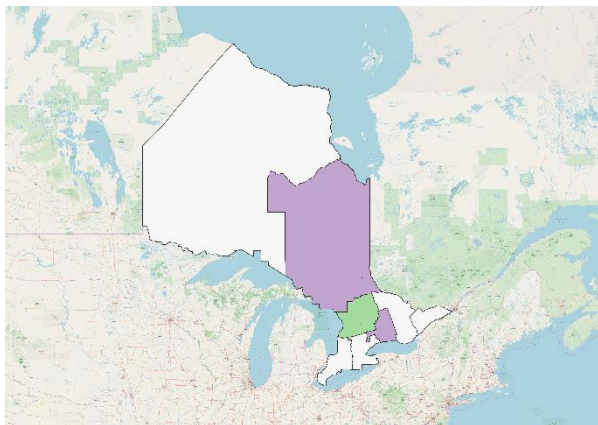
### Primary Residential



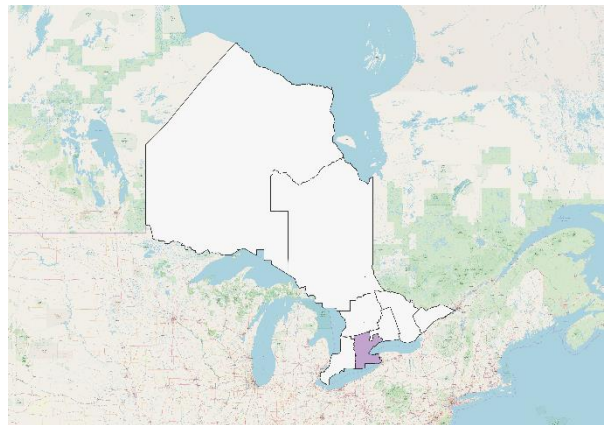
### GS<50



### Seasonal Residential



### GS>50



These charts show the difference between the share of the full population that is from a given region, and the share of the email sample from that region.

The difference between groups does not exceed more than 1.5 percentage points for any region across all rate classes, and in most regions the difference is no more than 0.5 percentage points.

Final results are weighted by region to ensure results are representative across the province.

*Note: The regions represented in the charts are graphical approximations of the regions used by Hydro One's distribution system planners. Customers are grouped by the region they are classified in by Hydro One.*

#### Difference between email sample and full population

More than -1.5%

-1.5% to -0.5%

-0.5% to +0.5%

+0.5% to +1.5%

More than +1.5%

# Sample Validation

## Telephone Survey and Online Workbook Completes

For the second step of the sample validation process, telephone reference surveys were conducted for all customer classes without perfect email coverage, namely Primary Residential, Seasonal Residential, Small Business and Commercial & Industrial.

### Telephone Survey Completes

Although surveyed separately to ensure proper representation of both rate classes, the results for Primary Residential and Seasonal Residential customers are reported together for both the telephone survey and online workbook.

Customer Type	Full Population	Telephone Sample	Unweighted Completes	Weighted Completes*
Primary Residential	1,070,319 records	19,914 records	n=533	n=560
Seasonal Residential	144,489 records	2,895 records	n=100	
Small business	111,749 records	9,488 records	n=266	n=250
C&I	8,058 records	1,318 records	n=100	n=60

### Online Workbook Completes

The online workbook was sent to a subset of email addresses for primary residential, seasonal residential and small business customers. All C&I and LDA customers with email addresses on file received the online workbook. Consistent with the telephone survey, primary and seasonal respondents were merged together to create the Residential rate class in both telephone and online workbook. Note, LDA respondents were not weighted due to the small number of completes.

Customer Type	Full Population	Emails Sent Out	Unweighted Completes	Weighted Completes*
Primary Residential	1,070,319 records	19,364 records	n=1,379	n=1,338
Seasonal Residential	144,489 records	7,299 records	n=141	
Small business	111,749 records	1,285 records	n=282	n=200
C&I	8,058 records	4,242 records	n=261	n=250
LDA	132 records	132 records	n=10	n/a

\*See following pages for details on weighting convention.  
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# Sample Validation

Residential



## Telephone vs. Online Sample Weights

Both the Residential telephone reference survey and representative online workbook were weighted based on known variables, including region, consumption and rate class. The Residential customer group includes both primary residential and seasonal residential customers. *Weighted and unweighted samples size are outlined below.*

### Residential Telephone Reference Survey

Region	Unweighted N					Weighted N				
	Consumption Quartiles					Consumption Quartiles				
	Low	Medium-Low	Medium-High	High	Total	Low	Medium-Low	Medium-High	High	Total
Southern	6.2%	7.2%	8.0%	7.0%	28.3%	6.3%	7.7%	7.8%	7.5%	29.3%
Central	8.3%	6.7%	5.6%	7.6%	28.2%	7.5%	6.7%	6.2%	7.3%	27.7%
Eastern	7.6%	7.6%	7.3%	6.8%	29.5%	7.4%	7.6%	7.7%	6.9%	29.6%
Northern	4.3%	3.5%	2.9%	3.3%	14.0%	3.7%	3.3%	3.0%	3.3%	13.3%
<b>Total</b>	<b>26.4%</b>	<b>25.0%</b>	<b>23.7%</b>	<b>24.8%</b>	<b>100%</b>	<b>25.0%</b>	<b>25.2%</b>	<b>24.8%</b>	<b>25.0%</b>	<b>100%</b>

### Residential Online Workbook

Region	Unweighted N					Weighted N				
	Consumption Quartiles					Consumption Quartiles				
	Low	Medium-Low	Medium-High	High	Total	Low	Medium-Low	Medium-High	High	Total
Southern	6.9%	7.3%	6.9%	5.1%	26.2%	6.5%	7.9%	7.7%	7.3%	29.4%
Central	6.9%	6.9%	7.3%	7.5%	28.6%	6.2%	6.5%	6.9%	8.0%	27.6%
Eastern	7.8%	8.9%	8.2%	7.2%	32.1%	7.3%	7.6%	7.9%	6.8%	29.7%
Northern	2.9%	3.2%	3.4%	3.7%	13.2%	3.8%	3.3%	3.0%	3.2%	13.3%
<b>Total</b>	<b>24.6%</b>	<b>26.2%</b>	<b>25.8%</b>	<b>23.5%</b>	<b>100%</b>	<b>23.8%</b>	<b>25.3%</b>	<b>25.5%</b>	<b>25.3%</b>	<b>100%</b>



### Summary of Residential Sample Validation

Comparing the results of the telephone survey with those of the online workbook with regard to basic demographics, outage experience, system familiarity and general attitudes towards electricity reveals minor differences between the two samples. Most notably, online respondents have higher education levels than telephone respondents. Online respondents are also more familiar with the delivery portion of their monthly electricity bill.

Gender	Telephone	Online	Difference
Male	55%	55%	0
Female	45%	41%	-4

Age	Telephone	Online	Difference
18-24	1%	0%	-1
25-34	7%	7%	0
35-44	10%	9%	-1
45-54	16%	15%	-1
55-64	25%	28%	+3
65 or older	40%	38%	-2

Education	Telephone	Online	Difference
Highschool or less	32%	18%	-14
College/Trades	32%	41%	+9
Post-secondary Degree	29%	33%	+4

Note: Sums added before rounding. "Prefer not to say/Other" not shown.

# Sample Validation

Residential



## Demographics

Household Size	Telephone	Online	Difference
1 person	18%	13%	-5
2 people	47%	54%	+7
3 people	14%	12%	-2
4 people	11%	12%	+1
5 people	4%	5%	0
6 people	2%	1%	-1
7 people	1%	0%	0
8 or more people	1%	0%	0

Household Income	Telephone	Online	Difference
Less than \$28,000	10%	6%	-4
Just over \$28,000 to \$39,000	8%	8%	-1
Just over \$39,000 to \$48,000	8%	8%	0
Just over \$48,000 to \$52,000	5%	8%	+2
More than \$52,000	45%	44%	0

LEAP Qualification	Telephone	Online	Difference
LEAP Qualified	12%	8%	-4
Not Qualified (<\$52k)	19%	22%	+3
Not Qualified (>\$52k)	44%	44%	0

# Sample Validation

Residential



## Familiarity and Satisfaction

Familiarity with electricity system	Telephone	Online	Difference
Very familiar and could explain the details of Ontario's electricity system to others	31%	18%	-13
Somewhat familiar, but could not explain all the details of Ontario's electricity system to others	40%	53%	+13
Have heard of some of the terms and organizations mentioned in this workbook, but knew very little about Ontario's electricity system	16%	20%	+4
I knew nothing about Ontario's electricity system	12%	8%	-5

Satisfaction with Hydro One	Telephone	Online	Difference
Very satisfied	41%	46%	+5
Somewhat satisfied	39%	34%	-5
Neither satisfied or dissatisfied	5%	11%	+6
Somewhat dissatisfied	8%	6%	-2
Very dissatisfied	5%	3%	-2
<b>Satisfied (Strongly + Somewhat)</b>	<b>80%</b>	<b>80%</b>	<b>0</b>
<b>Dissatisfied (Strongly + Somewhat)</b>	<b>13%</b>	<b>9%</b>	<b>-5</b>

# Sample Validation

Residential



## Bill Familiarity and Outage Experience

Familiarity w/ Delivery % of Bill	Telephone	Online	Difference
Very familiar	15%	18%	+3
Somewhat familiar	36%	42%	+7
Not familiar at all	43%	38%	-4
Don't know	6%	1%	-5

Number of Outages in Past Year	Telephone	Online	Difference
No outages	15%	14%	-1
1 outage	12%	10%	-2
2 outages	18%	19%	+2
3 outages	14%	17%	+3
4 outages	11%	8%	-3
5 outages	7%	7%	0
6 outages	6%	5%	-1
7 outages	2%	0%	-2
8 or more outages	10%	7%	-3
Don't know	5%	12%	+7



# Sample Validation

## Attitudes Towards Electricity

Residential



The cost of my electricity bill has a major impact on my finances and requires I do without some other important priorities.	Telephone	Online	Difference
Strongly agree	24%	25%	+1
Somewhat agree	33%	34%	+1
Somewhat disagree	21%	20%	0
Strongly disagree	15%	18%	+3
<b>Agree (Strongly + Somewhat)</b>	<b>56%</b>	<b>59%</b>	<b>+2</b>
<b>Disagree (Strongly + Somewhat)</b>	<b>36%</b>	<b>38%</b>	<b>+2</b>

Customers are well served by the electricity system in Ontario.	Telephone	Online	Difference
Strongly agree	34%	30%	-4
Somewhat agree	43%	53%	+9
Somewhat disagree	8%	10%	3
Strongly disagree	7%	4%	-2
<b>Agree (Strongly + Somewhat)</b>	<b>78%</b>	<b>83%</b>	<b>+5</b>
<b>Disagree (Strongly + Somewhat)</b>	<b>14%</b>	<b>15%</b>	<b>+1</b>

# Sample Validation

Small Business



## Telephone vs. Online Sample Weights

Both the Small Business telephone reference survey and representative online workbook were weighted based on known variables, including region, consumption and rate class. *Weighted and unweighted samples size are outlined below.*

### Small Business Telephone Reference Survey

Region	Unweighted N					Weighted N				
	Consumption Quartiles					Consumption Quartiles				
	Low	Medium-Low	Medium-High	High	Total	Low	Medium-Low	Medium-High	High	Total
Southern	7.5%	6.8%	7.5%	6.8%	28.6%	8.5%	8.3%	8.1%	8.6%	33.5%
Central	5.3%	5.6%	6.8%	7.5%	25.2%	5.7%	5.8%	5.8%	5.7%	23.0%
Eastern	4.1%	4.9%	6.8%	7.5%	23.3%	6.7%	6.9%	6.6%	6.3%	26.5%
Northern	5.6%	6.0%	5.3%	6.0%	22.9%	4.2%	4.1%	4.5%	4.4%	17.1%
<b>Total</b>	<b>22.6%</b>	<b>23.3%</b>	<b>26.3%</b>	<b>27.8%</b>	<b>100%</b>	<b>25.0%</b>	<b>25.0%</b>	<b>25.0%</b>	<b>25.0%</b>	<b>100%</b>

### Small Business Representative Online Workbook

Region	Unweighted N					Weighted N				
	Consumption Quartiles					Consumption Quartiles				
	Low	Medium-Low	Medium-High	High	Total	Low	Medium-Low	Medium-High	High	Total
Southern	8.2%	6.0%	8.2%	7.4%	29.8%	8.5%	8.3%	8.1%	8.6%	33.5%
Central	5.7%	5.7%	10.6%	4.3%	26.2%	5.7%	5.8%	5.8%	5.7%	23.0%
Eastern	7.8%	8.2%	6.7%	3.5%	26.2%	6.7%	6.9%	6.6%	6.3%	26.5%
Northern	5.7%	4.6%	3.9%	3.5%	17.7%	4.2%	4.1%	4.5%	4.4%	17.1%
<b>Total</b>	<b>27.3%</b>	<b>24.5%</b>	<b>29.4%</b>	<b>18.8%</b>	<b>100%</b>	<b>25.0%</b>	<b>25.0%</b>	<b>25.0%</b>	<b>25.0%</b>	<b>100%</b>



### Summary of Small Business Sample Validation

Comparing the results of the telephone survey with those of the online workbook with regard to basic firmographics, outage experience, system familiarity and general attitudes towards electricity reveals minor differences between the two samples.

Online respondents are more likely to say they are familiar with Ontario's electricity system compared to telephone respondents. Additionally, online respondents are more familiar with the delivery portion of their electricity bills than telephone respondents.

In terms of overall satisfaction with Hydro One, online respondents are less satisfied with Hydro One.

Online respondents are also more likely to state that their organization's electricity bill has a major impact on their organization's bottom line.

Company Size	Telephone	Online	Difference
1 person	9%	11%	+2
2 to 5 people	37%	41%	+4
6 to 10 people	18%	15%	-3
11 to 25 people	12%	11%	-2
26 to 50 people	11%	4%	-7
More than 50 people	11%	7%	-4

Company Type	Telephone	Online	Difference
Commercial	20%	16%	-5
Manufacturing/Industrial	7%	8%	0
Hospitality	10%	12%	+3
Restaurant/Tavern	3%	3%	0
Retail	10%	7%	-4
Warehouse	2%	1%	-1
Real Estate	5%	5%	0
Other	43%	35%	-7

# Sample Validation

Small Business



## Familiarity and Satisfaction

Familiarity with electricity system	Telephone	Online	Difference
Very familiar and could explain the details of Ontario's electricity system to others	27%	21%	-6
Somewhat familiar, but could not explain all the details of Ontario's electricity system to others	41%	58%	+16
Have heard of some of the terms and organizations mentioned in this workbook, but knew very little about Ontario's electricity system	22%	15%	-7
I knew nothing about Ontario's electricity system	9%	5%	-4

Satisfaction with Hydro One	Telephone	Online	Difference
Very satisfied	41%	39%	-2
Somewhat satisfied	43%	38%	-5
Neither satisfied or dissatisfied	5%	11%	+6
Somewhat dissatisfied	6%	6%	0
Very dissatisfied	4%	6%	+2
<b>Satisfied (Strongly + Somewhat)</b>	<b>84%</b>	<b>77%</b>	<b>-7</b>
<b>Dissatisfied (Strongly + Somewhat)</b>	<b>10%</b>	<b>12%</b>	<b>+2</b>

# Sample Validation

Small Business



## Outage Experience and Service Type

Familiarity w/ Delivery % of Bill	Telephone	Online	Difference
Very familiar	11%	17%	+7
Somewhat familiar	35%	46%	+11
Not familiar at all	51%	35%	-15

Number of Outages in Past Year	Telephone	Online	Difference
No outages	17%	12%	-6
1 outage	10%	7%	-3
2 outages	18%	15%	-3
3 outages	15%	17%	+2
4 outages	9%	9%	0
5 outages	5%	8%	+3
6 outages	5%	6%	+1
7 outages	1%	1%	0
8 or more outages	11%	11%	-1

# Sample Validation

## Attitudes Towards Electricity

Small Business



The cost of my electricity bill has a major impact on the bottom line of my organization and results in some important spending priorities and investments being put off.	Telephone	Online	Difference
Strongly agree	34%	35%	0
Somewhat agree	31%	35%	+4
Somewhat disagree	19%	14%	-5
Strongly disagree	7%	7%	0
<b>Agree (Strongly + Somewhat)</b>	<b>65%</b>	<b>70%</b>	<b>+5</b>
<b>Disagree (Strongly + Somewhat)</b>	<b>27%</b>	<b>21%</b>	<b>-5</b>

Customers are well served by the electricity system in Ontario.	Telephone	Online	Difference
Strongly agree	30%	28%	-2
Somewhat agree	48%	54%	+6
Somewhat disagree	8%	8%	0
Strongly disagree	6%	6%	0
<b>Agree (Strongly + Somewhat)</b>	<b>78%</b>	<b>82%</b>	<b>+4</b>
<b>Disagree (Strongly + Somewhat)</b>	<b>14%</b>	<b>14%</b>	<b>0</b>

# Sample Validation

Commercial  
& Industrial



## Telephone vs. Online Sample Weights

Both the C&I telephone reference survey and online workbook were weighted based on region. *Weighted and unweighted samples size are outlined below.*

### C&I Telephone Reference Survey

Region	Unweighted N		Weighted N	
	Completes	Distribution	Completes	Distribution
Southern	52	52%	<b>26</b>	<b>43%</b>
Central	23	23%	<b>12</b>	<b>20%</b>
Eastern	21	21%	<b>15</b>	<b>24%</b>
Northern	4	4%	<b>8</b>	<b>13%</b>
<b>Total</b>	<b>100</b>	<b>100%</b>	<b>60</b>	<b>100%</b>

### C&I Representative Online Workbook

Region	Unweighted N		Weighted N	
	Completes	Distribution	Completes	Distribution
Southern	135	52%	<b>107</b>	<b>43%</b>
Central	41	16%	<b>50</b>	<b>20%</b>
Eastern	59	23%	<b>60</b>	<b>24%</b>
Northern	26	10%	<b>33</b>	<b>13%</b>
<b>Total</b>	<b>261</b>	<b>100%</b>	<b>250</b>	<b>100%</b>

**Note:** *Graphs and tables may not always total 100% due to rounding values rather than any error in data. Sums are added before rounding numbers. Caution interpreting results with small n-sizes.*



### Summary of Commercial & Industrial Sample Validation

Comparing the results of the telephone survey with those of the online workbook with regard to basic firmographics, outage experience, system familiarity and general attitudes towards electricity reveals minor differences between the two samples.

Regarding basic firmographics, online respondents are more likely to work for larger companies than telephone respondents. Similar to the Small Business online vs. telephone comparison, online C&I respondents are less likely to say they know very little or nothing about Ontario's electricity system and are more likely to be familiar with the delivery portion of their electricity bill. Satisfaction with Hydro One is lower among online respondents. They are also more likely to agree that the cost of their organization's electricity bill has a major impact on their organization's bottom line.

Company Size	Telephone	Online	Difference
1 person	2%	1%	-1
2 to 5 people	14%	9%	-5
6 to 10 people	16%	12%	-4
11 to 25 people	19%	23%	+5
26 to 50 people	21%	19%	-2
More than 50 people	24%	33%	+9

Company Type	Telephone	Online	Difference
Commercial	15%	4%	-11
Manufacturing/Industrial	31%	32%	0
Hospitality	4%	7%	+4
Restaurant/Tavern	5%	4%	0
Retail	7%	7%	-1
Warehouse	2%	3%	+1
Multi Unit Residential	3%	1%	-2
Other	33%	38%	+5



# Sample Validation

## Familiarity and Satisfaction

Commercial  
& Industrial



<b>Familiarity with electricity system</b>	<b>Telephone</b>	<b>Online</b>	<b>Difference</b>
Very familiar and could explain the details of Ontario's electricity system to others	19%	16%	-2
Somewhat familiar, but could not explain all the details of Ontario's electricity system to others	42%	61%	+19
Have heard of some of the terms and organizations mentioned in this workbook, but knew very little about Ontario's electricity system	28%	16%	-12
I knew nothing about Ontario's electricity system	11%	4%	-7

<b>Satisfaction with Hydro One</b>	<b>Telephone</b>	<b>Online</b>	<b>Difference</b>
Very satisfied	29%	37%	+7
Somewhat satisfied	55%	39%	-15
Neither satisfied or dissatisfied	7%	15%	+8
Somewhat dissatisfied	2%	5%	+4
Very dissatisfied	4%	3%	-1
<b>Agree (Strongly + Somewhat)</b>	<b>84%</b>	<b>76%</b>	<b>-8</b>
<b>Disagree (Strongly + Somewhat)</b>	<b>6%</b>	<b>8%</b>	<b>+2</b>

# Sample Validation

## Outage Experience and Service Type

Commercial  
& Industrial



Familiarity w/ distribution % of Bill	Telephone	Online	Difference
Very familiar	9%	21%	+12
Somewhat familiar	37%	47%	+10
Not familiar at all	52%	32%	-21

Number of Outages in Past Year	Telephone	Online	Difference
No outages	14%	14%	-1
1 outage	9%	12%	+4
2 outages	19%	20%	+1
3 outages	15%	14%	-1
4 outages	7%	9%	+2
5 outages	3%	3%	0
6 outages	6%	4%	-2
7 outages	1%	1%	-1
8 or more outages	10%	7%	-3

# Sample Validation

## Attitudes Towards Electricity

Commercial  
& Industrial



The cost of my electricity bill has a major impact on the bottom line of my organization and results in some important spending priorities and investments being put off.	Telephone	Online	Difference
Strongly agree	48%	52%	+3
Somewhat agree	33%	33%	-1
Somewhat disagree	11%	9%	-2
Strongly disagree	2%	3%	+1
<b>Agree (Strongly + Somewhat)</b>	<b>81%</b>	<b>84%</b>	<b>+3</b>
<b>Disagree (Strongly + Somewhat)</b>	<b>13%</b>	<b>12%</b>	<b>-1</b>

Customers are well served by the electricity system in Ontario.	Telephone	Online	Difference
Strongly agree	22%	24%	+2
Somewhat agree	60%	59%	-1
Somewhat disagree	8%	12%	+4
Strongly disagree	6%	3%	-3
<b>Agree (Strongly + Somewhat)</b>	<b>82%</b>	<b>84%</b>	<b>+1</b>
<b>Disagree (Strongly + Somewhat)</b>	<b>14%</b>	<b>14%</b>	<b>+1</b>

# Residential and Business Customers **Workbook Diagnostics**



# Workbook Diagnostics

## Summary

In addition to substantive questions about Hydro One's distribution system, the workbook asked customers for feedback about this customer engagement and the online workbook.

### Customer engagement approach

The large majority of all customer types believe the engagement is the right approach to bringing customer needs and preferences into Hydro One's plan.

	Residential	Small Business	Commercial & Industrial	Large Dx Accounts
Definitely the right approach	28%	28%	32%	40%
Probably the right approach	61%	59%	54%	50%
Probably the wrong approach	3%	4%	4%	-
Definitely the wrong approach	1%	1%	1%	-
Don't know	7%	8%	9%	10%

Note: Interpret LDA values with caution, as sample size (n=10) is very small.

### Impression of the online workbook

The majority of customers from each customer type have a favourable impression of the workbook.

	Residential	Small Business	Commercial & Industrial	Large Dx Accounts
Very favourable	30%	29%	20%	20%
Somewhat favourable	54%	52%	61%	50%
Somewhat unfavourable	10%	10%	9%	20%
Very unfavourable	3%	4%	4%	10%
Don't know	3%	5%	6%	-

Note: Interpret LDA values with caution, as sample size (n=10) is very small.

### Amount of information in the workbook

At least half of the respondents within each customer group believe the right amount of information was provided. Respondents were more likely to say too much information was provided, rather than too little.

	Residential	Small Business	Commercial & Industrial	Large Dx Accounts
Too little information	7%	9%	9%	10%
Just the right amount of information	79%	77%	76%	50%
Too much information	14%	15%	15%	40%

Note: Interpret LDA values with caution, as sample size (n=10) is very small.

# Online Workbook

## How Does Hydro One Consider Customer Views in Its Plan?

### Hydro One's Investment Plan

Hydro One is about to begin developing its investment plan for the period covering the years 2023-2027. Throughout its planning process, Hydro One planners will identify a number of areas where they believe investments could provide customer benefit, by addressing areas such as asset condition, reliability, preparing for severe weather or finding cost savings through new technologies.

The Ontario Energy Board (OEB) requires that Hydro One has a plan that responds to customer needs and preferences. While conversations with customers will continue over the next several months, Hydro One wants to hear your preferences when it comes to finding the right balance between costs and other outcomes.

- On the pages that follow, we are going to ask you about **10** trade-offs that planners are looking for your guidance on. Your answers to these questions will be combined with feedback from other customers and presented to Hydro One's planners.
- Once planners have received your feedback, they will proceed with developing a draft plan. Later in 2020, we will be returning to customers to again gather feedback on the draft plan.
- While the questions throughout this workbook will focus on high-level trade-offs between various types of investments, the next phase in 2020 will ask you about specific investments and programs.
- Some questions include the bill impacts associated with the types of investments.\* These bill impacts are directional in nature and correspond to additional spending on equipment only. They do not correspond to a specific investment plan. In the next phase in 2020, bill impacts will be refined to more precise amounts, once the investment plan has been drafted.

**Hydro One has developed a five phase approach to gathering and responding to customer feedback:**

You are here

**1. Identify customer priorities:** Today, Hydro One is asking customers from across Ontario about their needs and priorities for electricity distribution and transmission service.

**2. Use customer feedback to guide development of plan:** Key findings from the initial customer engagement will be presented to planners to inform the investment plan.

**3. Collect customer feedback on the draft investment plan:** In the Summer and Fall of 2020, Hydro One is returning to customers to get feedback on the draft investment plan, including specific business choices it needs to make.

**4. Revise investment plan:** Make appropriate changes to the plan based on customer feedback and other factors, like OEB guidance, that may influence investment needs.

**5. Submit the plan to the Ontario Energy Board:** File the plan, this workbook, and a summary report with the OEB where it will be examined by the OEB, consumer advocates, and other independent parties in a public hearing.

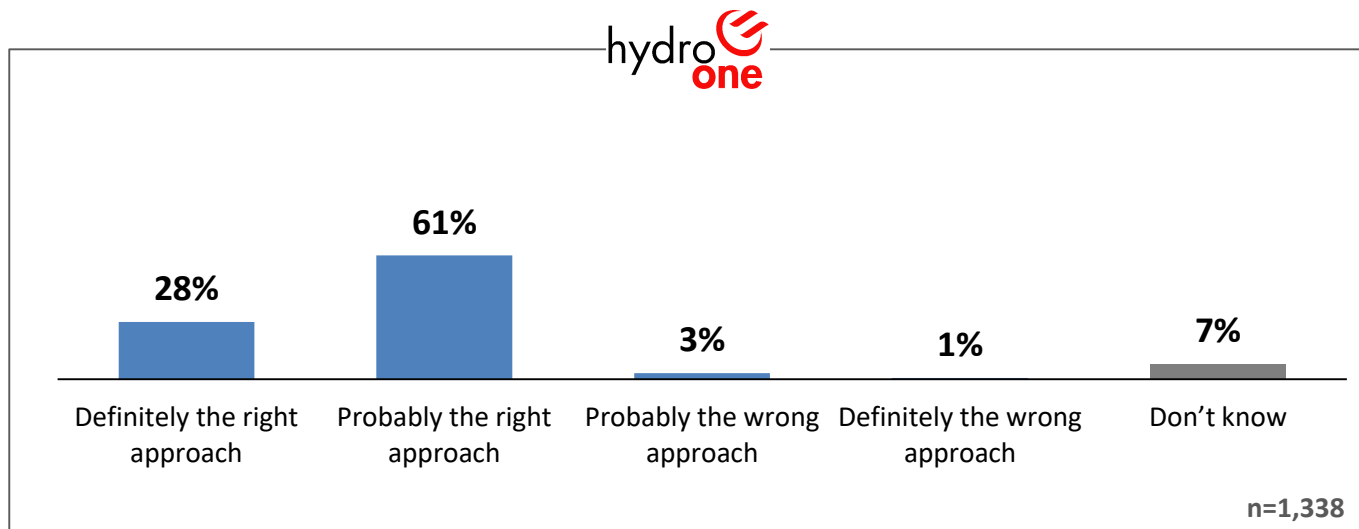
\*Bill impacts included in the investment options do not reflect the following factors, which will be incorporated in the next phase in 2020: returns on historical spending, other spending not included in these investment options, operating expenses, and forecast consumption, among other things.



## How Does Hydro One Consider Customer Views in Its Plan?

Q

Does this customer engagement approach seem like the right approach or the wrong approach to bring customer needs and preferences into Hydro One's plan?



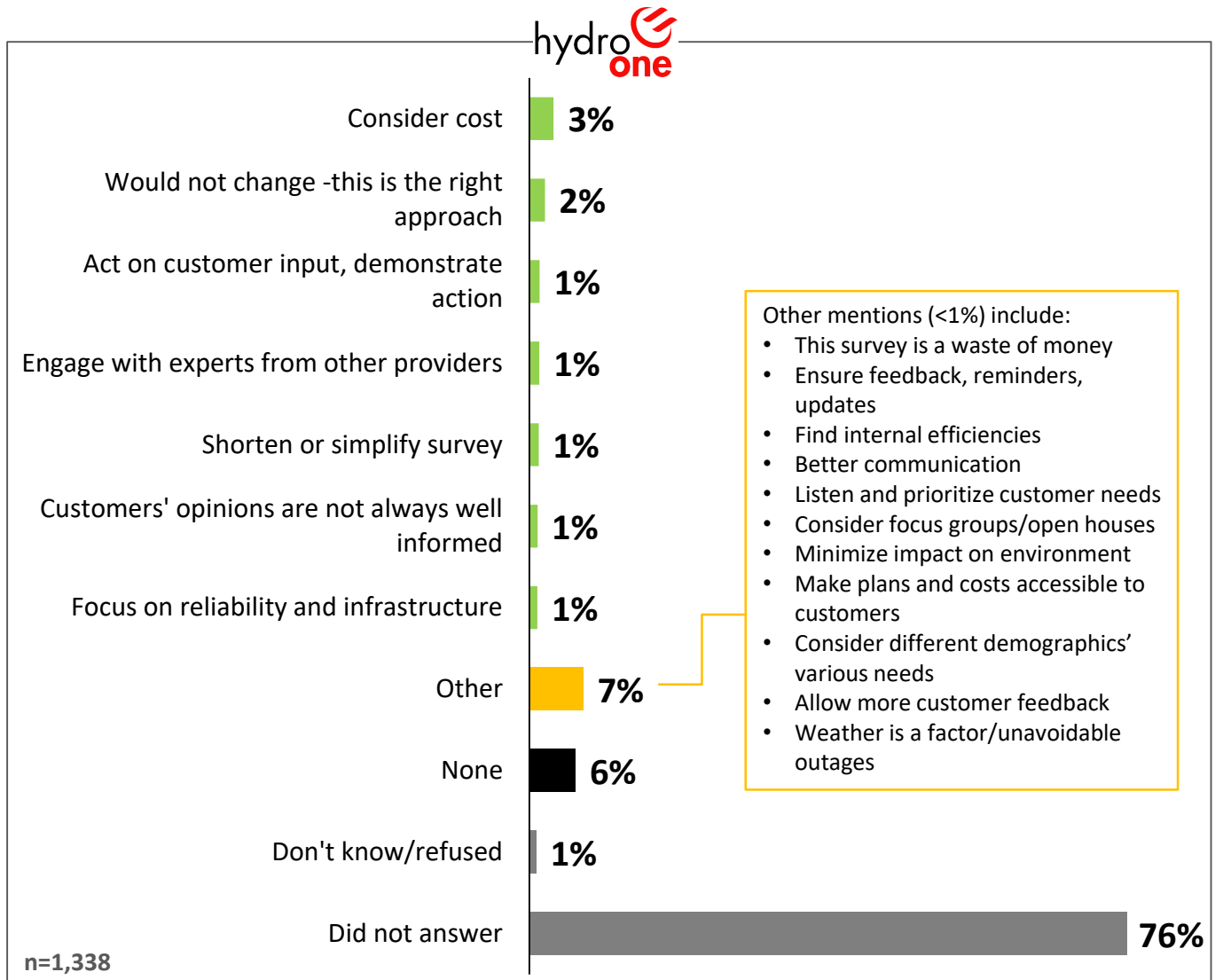
	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Definitely the right approach	28%	28%	29%	28%	30%	27%	29%
Probably the right approach	61%	61%	63%	62%	60%	61%	61%
Probably the wrong approach	3%	3%	1%	2%	3%	3%	4%
Definitely the wrong approach	1%	1%	-	0%	1%	1%	-
Don't know	7%	8%	6%	8%	7%	8%	6%



## How Does Hydro One Consider Customer Views in Its Plan?

Q

Is there anything in particular you would change about this approach or any other comments you would like to make?



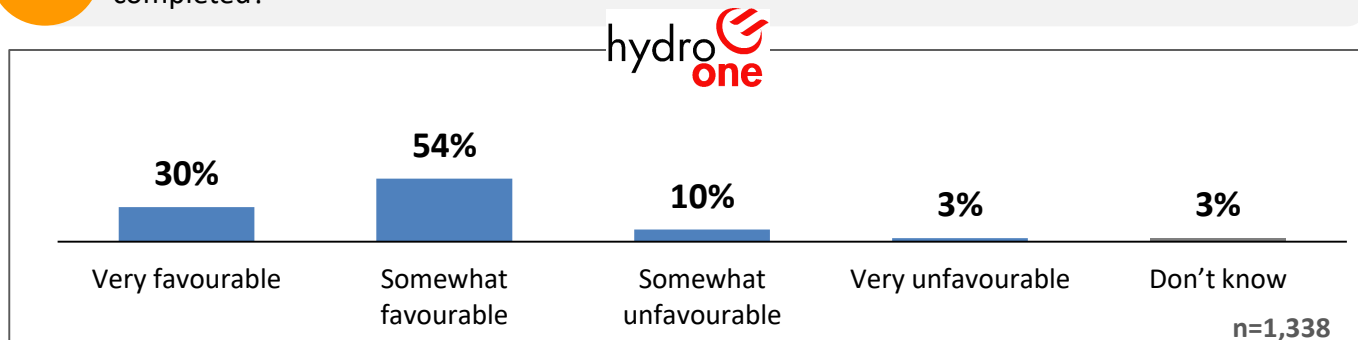




## Feedback on Hydro One's Customer Engagement

Q

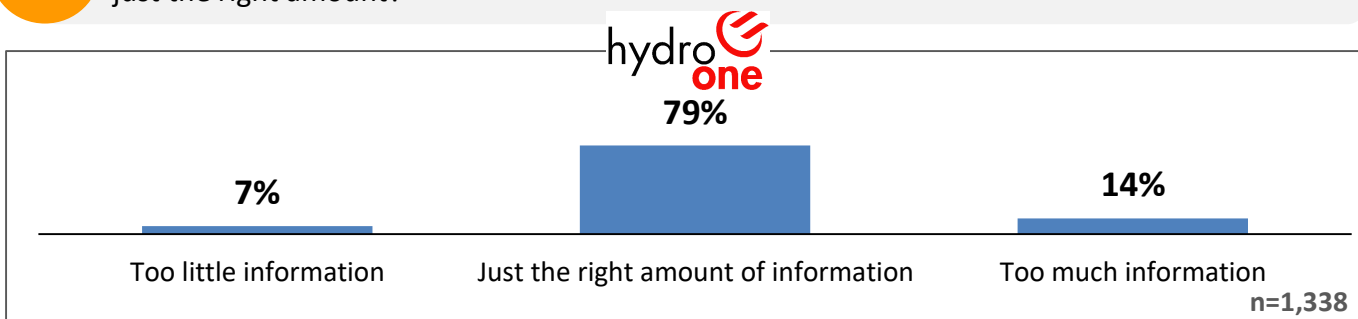
Overall, did you have a favourable or unfavourable impression of the workbook you just completed?



	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Very favourable	30%	30%	25%	29%	30%	31%	28%
Somewhat favourable	54%	54%	58%	54%	53%	52%	60%
Somewhat unfavourable	10%	10%	11%	10%	11%	12%	7%
Very unfavourable	3%	3%	3%	2%	4%	3%	3%
Don't know	3%	3%	2%	4%	3%	2%	2%

Q

In this workbook, do you feel that Hydro One provided too much information, not enough, or just the right amount?



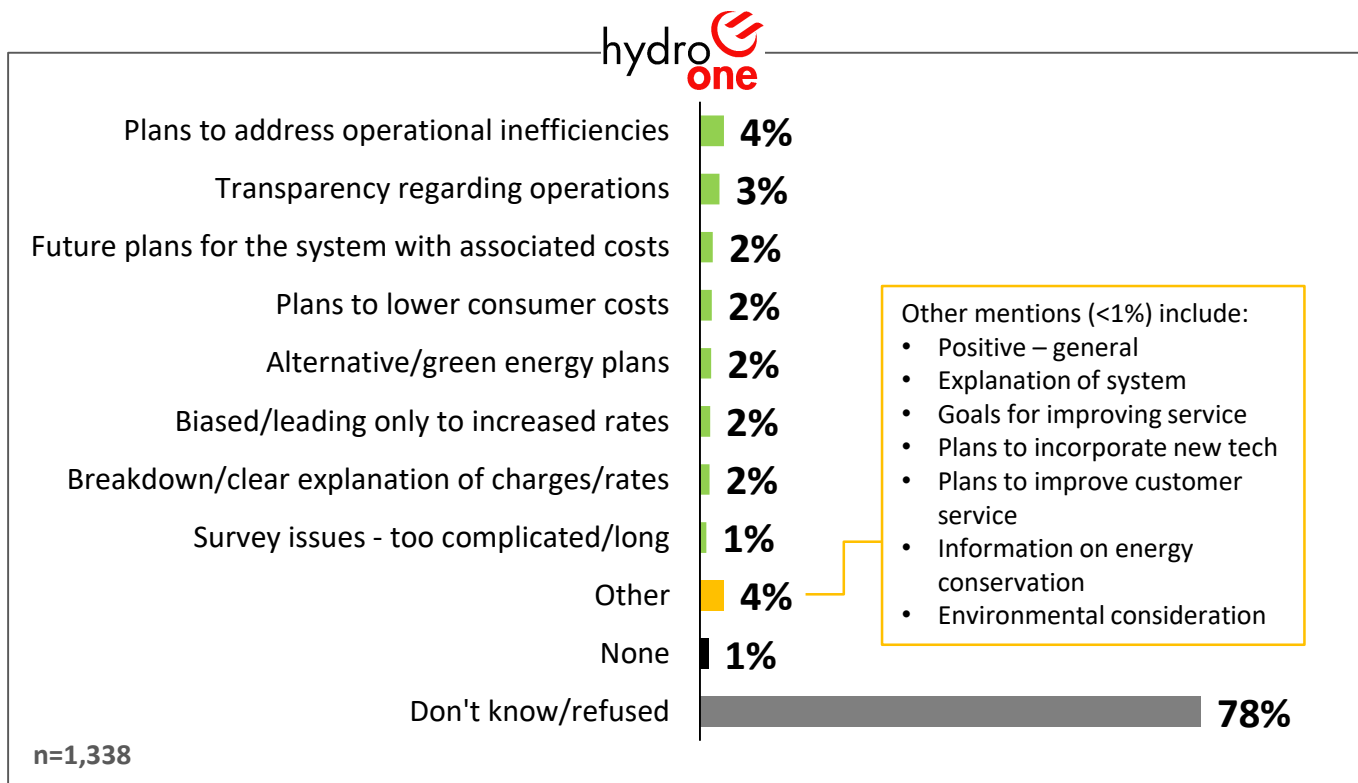
	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Too little information	7%	7%	10%	5%	7%	8%	7%
Just the right amount of information	79%	80%	76%	81%	78%	77%	85%
Too much information	14%	14%	15%	15%	14%	15%	8%



## Feedback on Hydro One's Customer Engagement

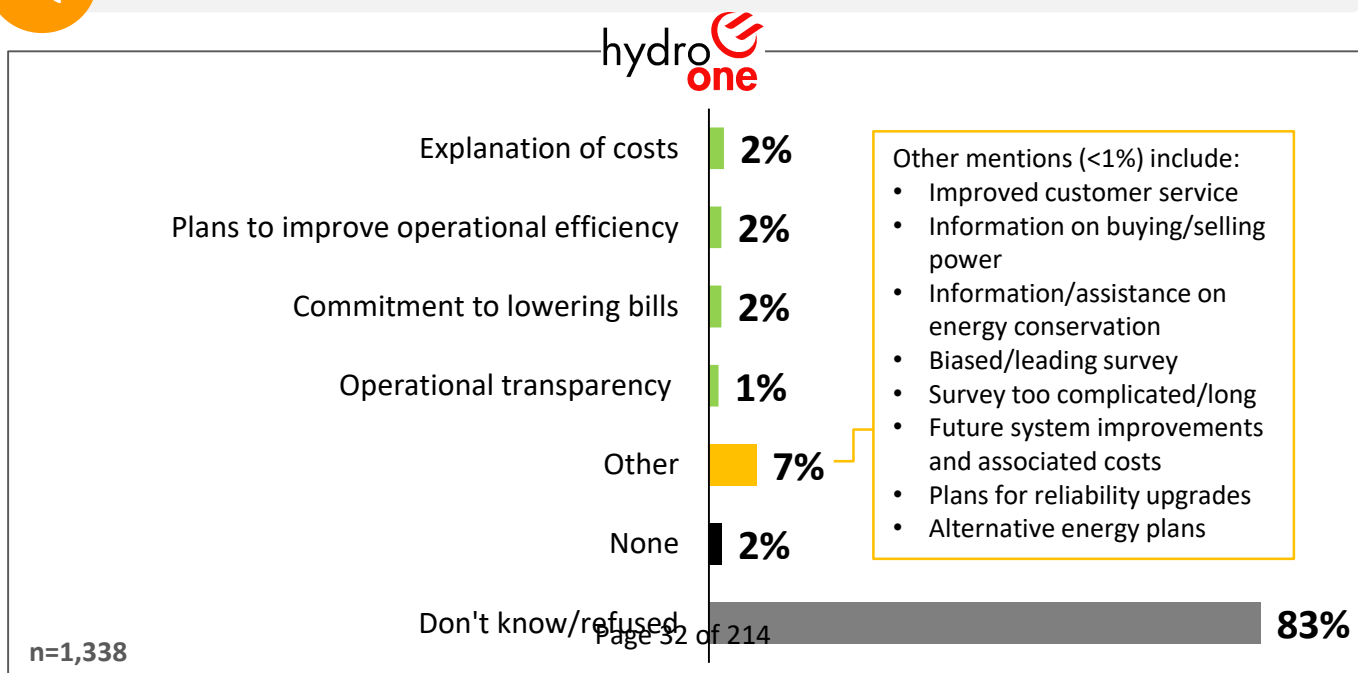
Q

Was there any content missing that you would have liked to have seen included in this workbook?



Q

Is there anything that you would still like answered?

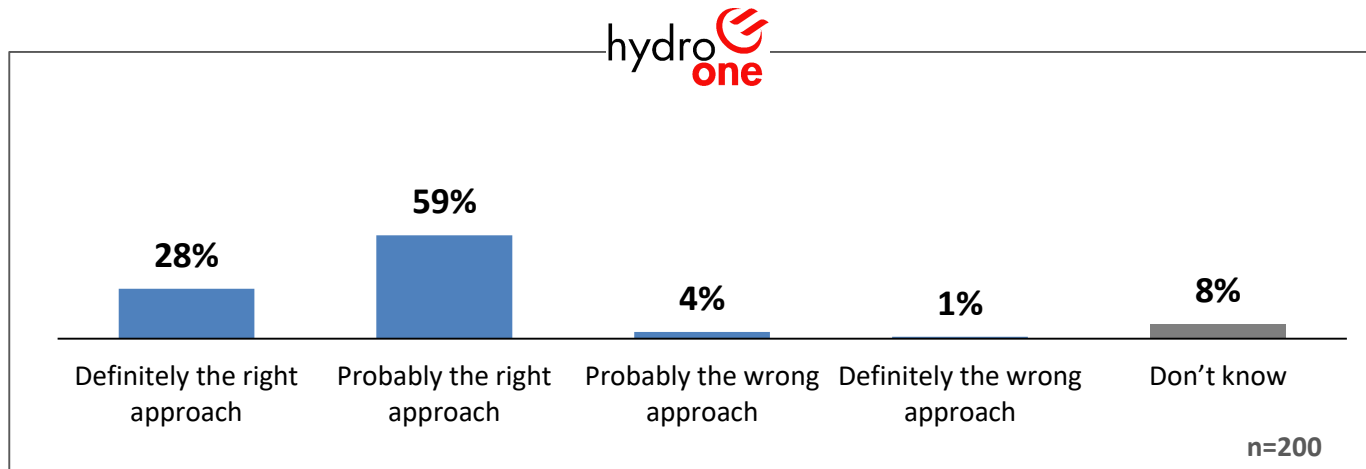




## How Does Hydro One Consider Customer Views in Its Plan?

Q

Does this customer engagement approach seem like the right approach or the wrong approach to bring customer needs and preferences into Hydro One's plan?



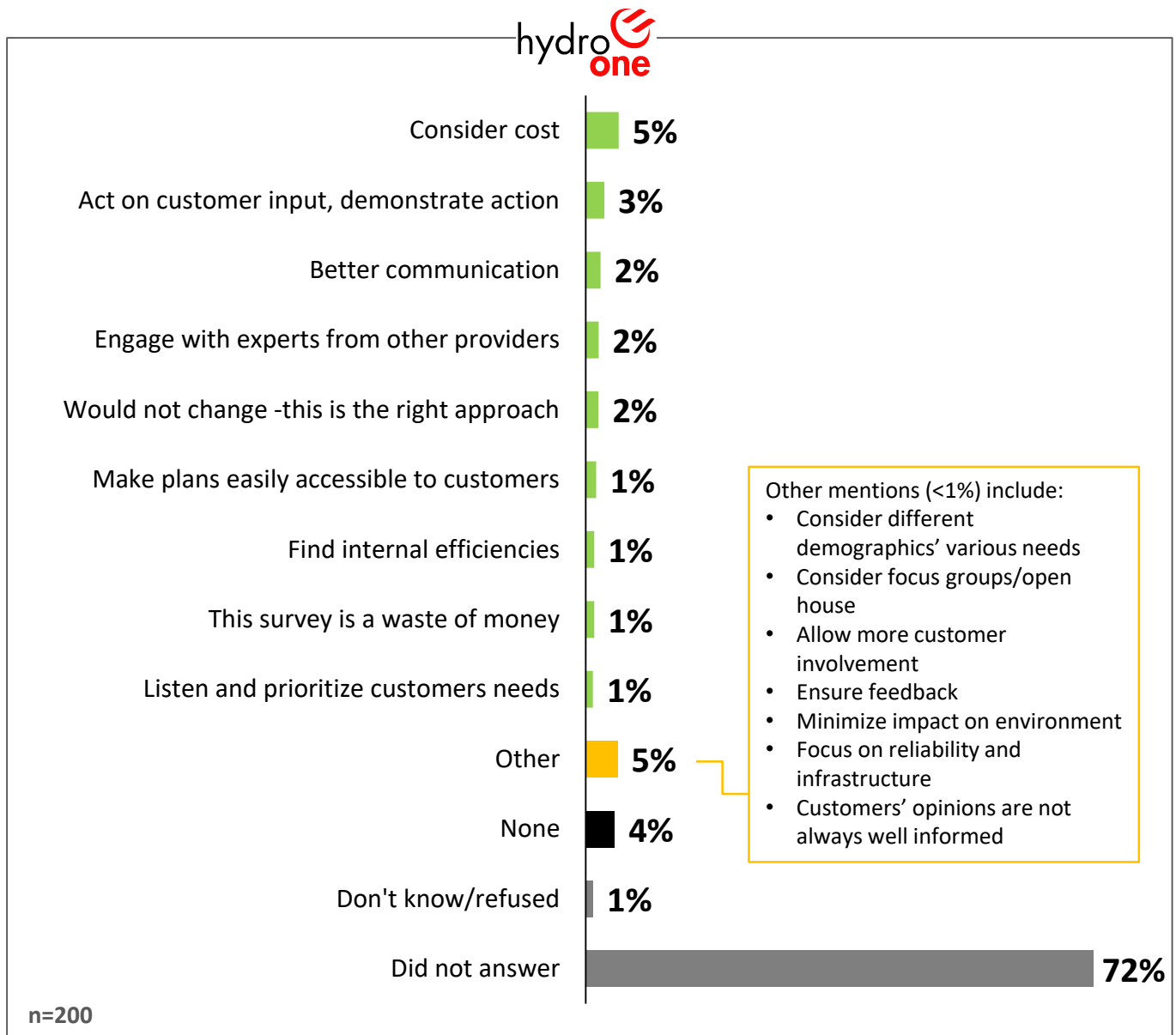
	Total	Southern	Central	Eastern	Northern
Definitely the right approach	28%	29%	25%	37%	18%
Probably the right approach	59%	65%	58%	46%	66%
Probably the wrong approach	4%	-	6%	5%	7%
Definitely the wrong approach	1%	-	2%	2%	-
Don't know	8%	6%	10%	9%	9%



## How Does Hydro One Consider Customer Views in Its Plan?

Q

Is there anything in particular you would change about this approach or any other comments you would like to make?

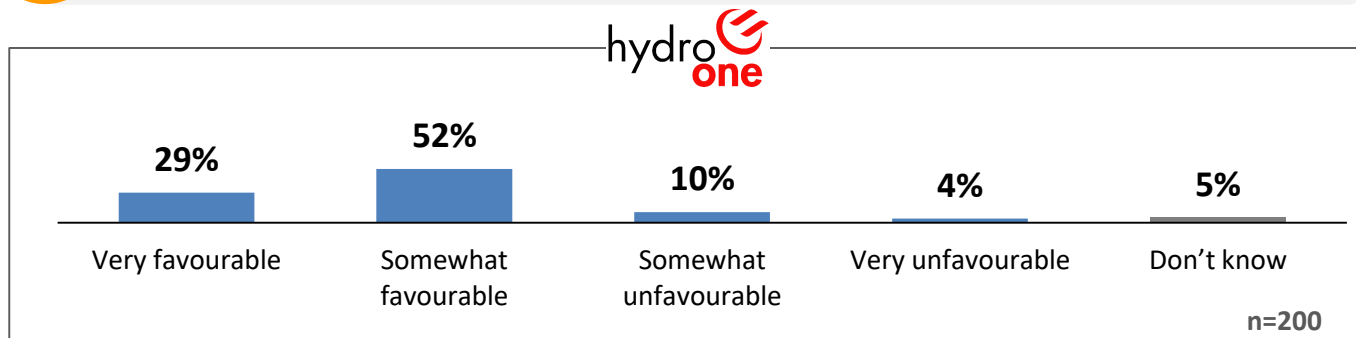




## Feedback on Hydro One's Customer Engagement

Q

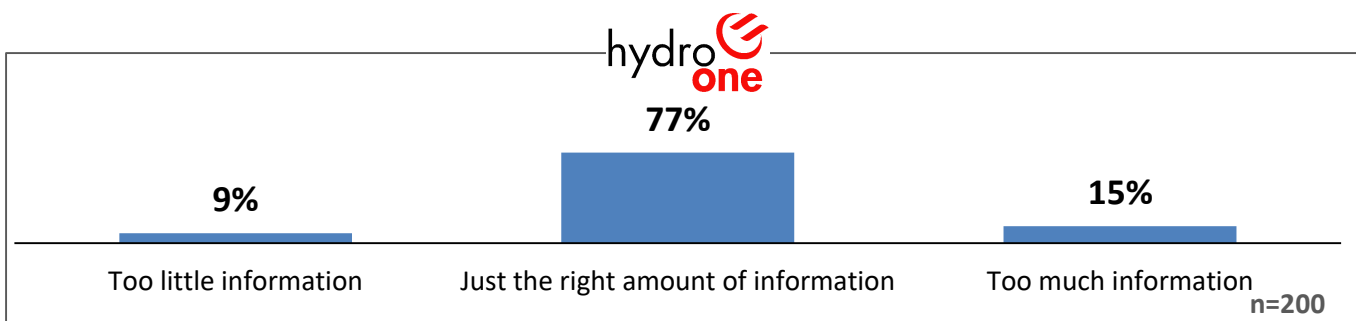
Overall, did you have a favourable or unfavourable impression of the workbook you just completed?



	Total	Southern	Central	Eastern	Northern
Very favourable	29%	28%	28%	34%	24%
Somewhat favourable	52%	59%	51%	42%	56%
Somewhat unfavourable	10%	6%	9%	14%	14%
Very unfavourable	4%	2%	4%	6%	4%
Don't know	5%	5%	8%	5%	2%

Q

In this workbook, do you feel that Hydro One provided too much information, not enough, or just the right amount?



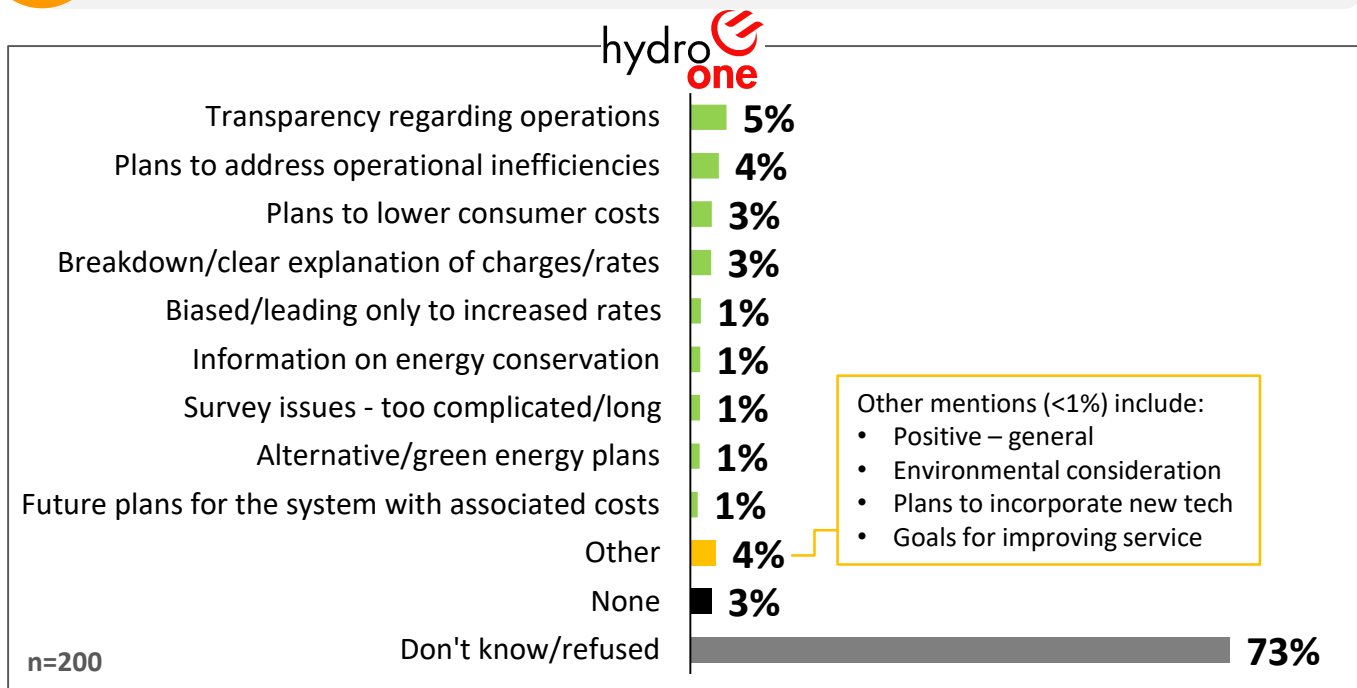
	Total	Southern	Central	Eastern	Northern
Too little information	9%	6%	13%	8%	8%
Just the right amount of information	77%	82%	67%	76%	81%
Too much information	15%	12%	20%	15%	10%



## Feedback on Hydro One's Customer Engagement

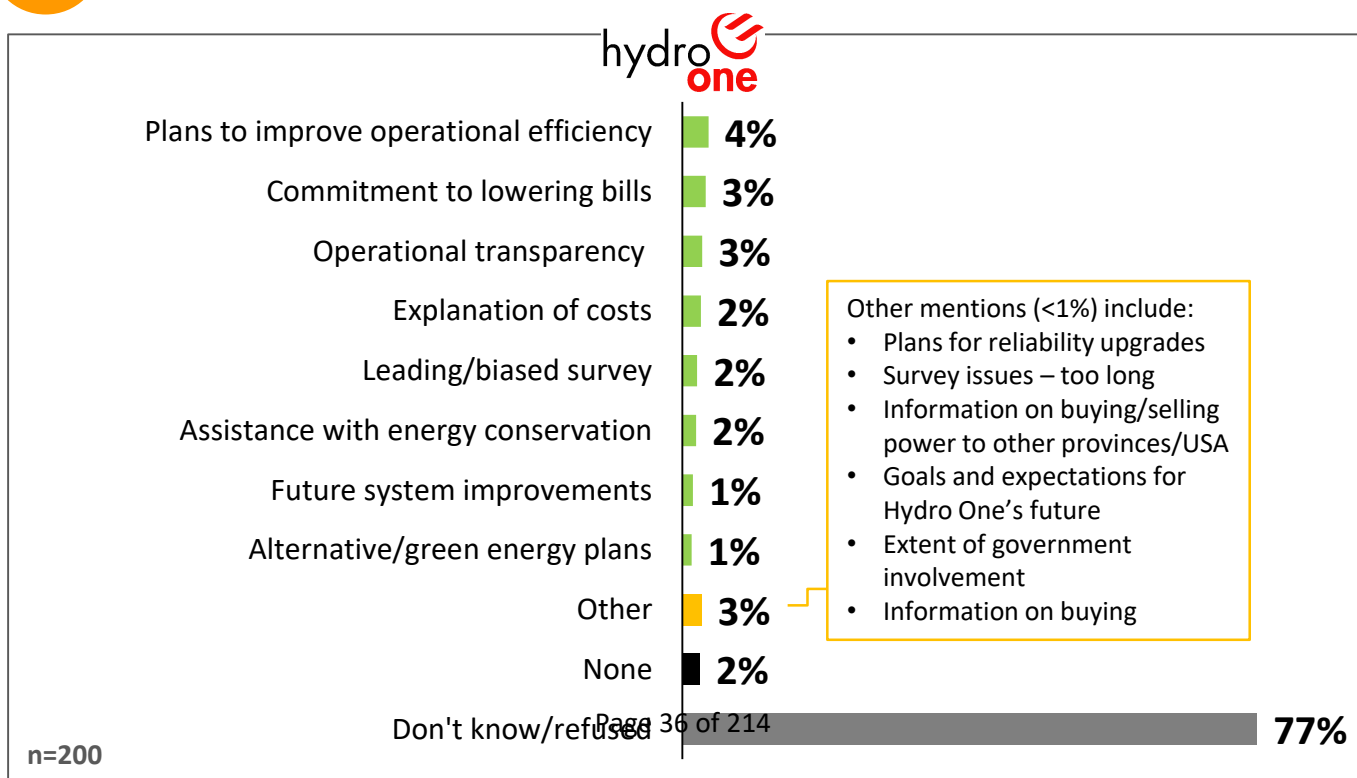
Q

Was there any content missing that you would have liked to have seen included in this workbook?



Q

Is there anything that you would still like answered?

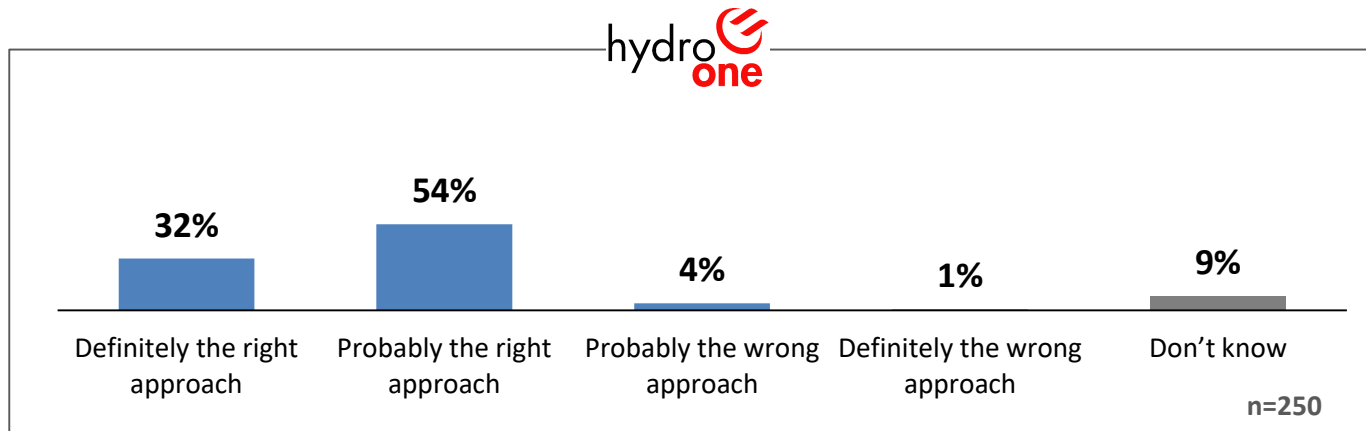




## How Does Hydro One Consider Customer Views in Its Plan?

Q

Does this customer engagement approach seem like the right approach or the wrong approach to bring customer needs and preferences into Hydro One's plan?

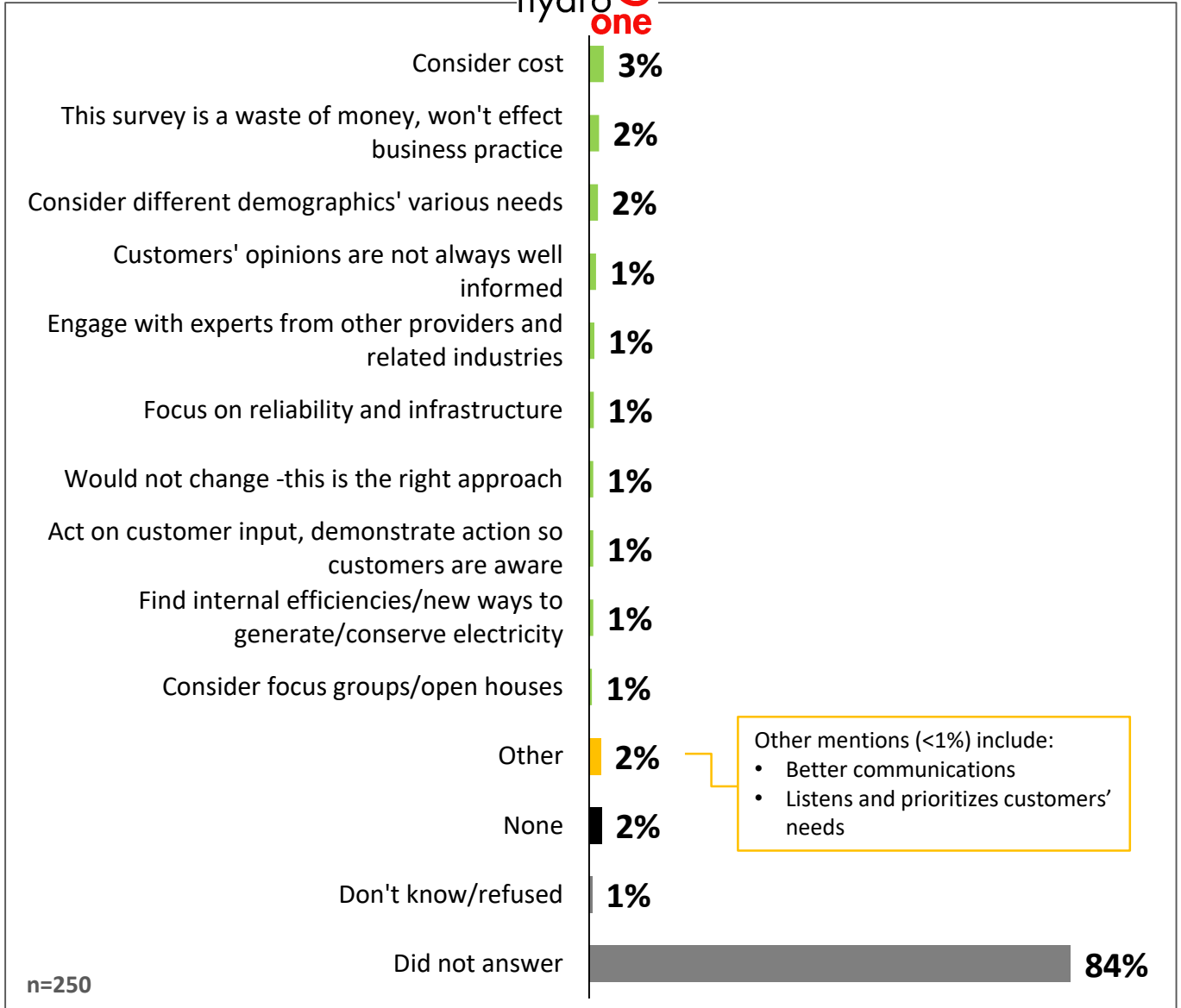


	Total	Southern	Central	Eastern	Northern
Definitely the right approach	32%	35%	29%	27%	38%
Probably the right approach	54%	55%	51%	58%	46%
Probably the wrong approach	4%	3%	7%	5%	4%
Definitely the wrong approach	1%	1%	-	-	-
Don't know	9%	6%	12%	10%	12%

## How Does Hydro One Consider Customer Views in Its Plan?



Is there anything in particular you would change about this approach or any other comments you would like to make?

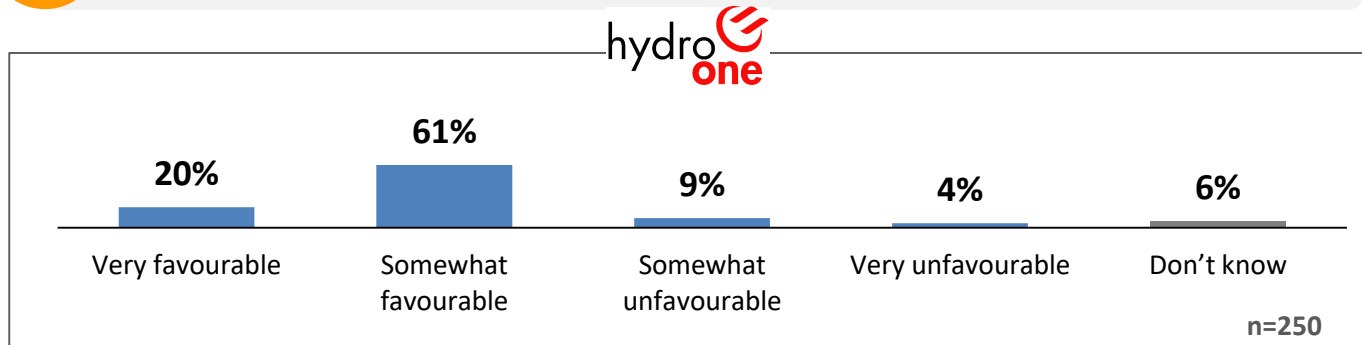






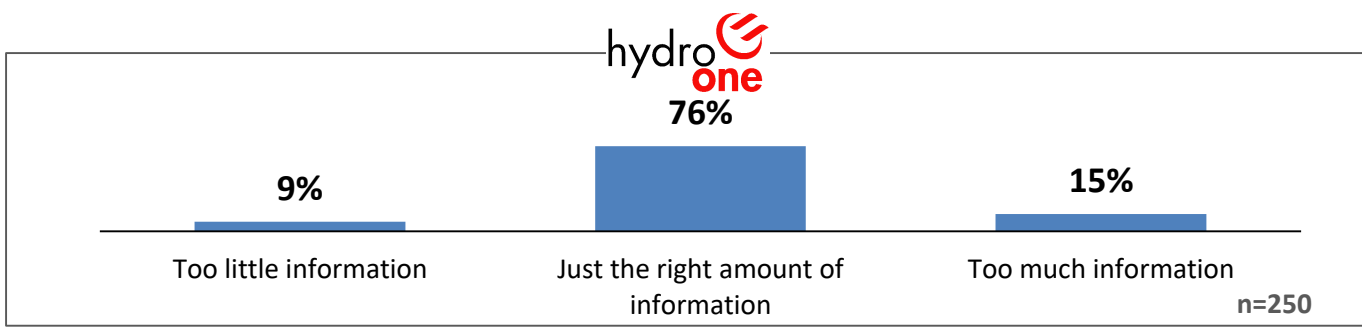
## Feedback on Hydro One's Customer Engagement

**Q** Overall, did you have a favourable or unfavourable impression of the workbook you just completed?



	Total	Southern	Central	Eastern	Northern
Very favourable	20%	23%	15%	19%	19%
Somewhat favourable	61%	61%	59%	63%	58%
Somewhat unfavourable	9%	8%	10%	7%	15%
Very unfavourable	4%	5%	2%	7%	-
Don't know	6%	2%	15%	5%	8%

**Q** In this workbook, do you feel that Hydro One provided too much information, not enough, or just the right amount?



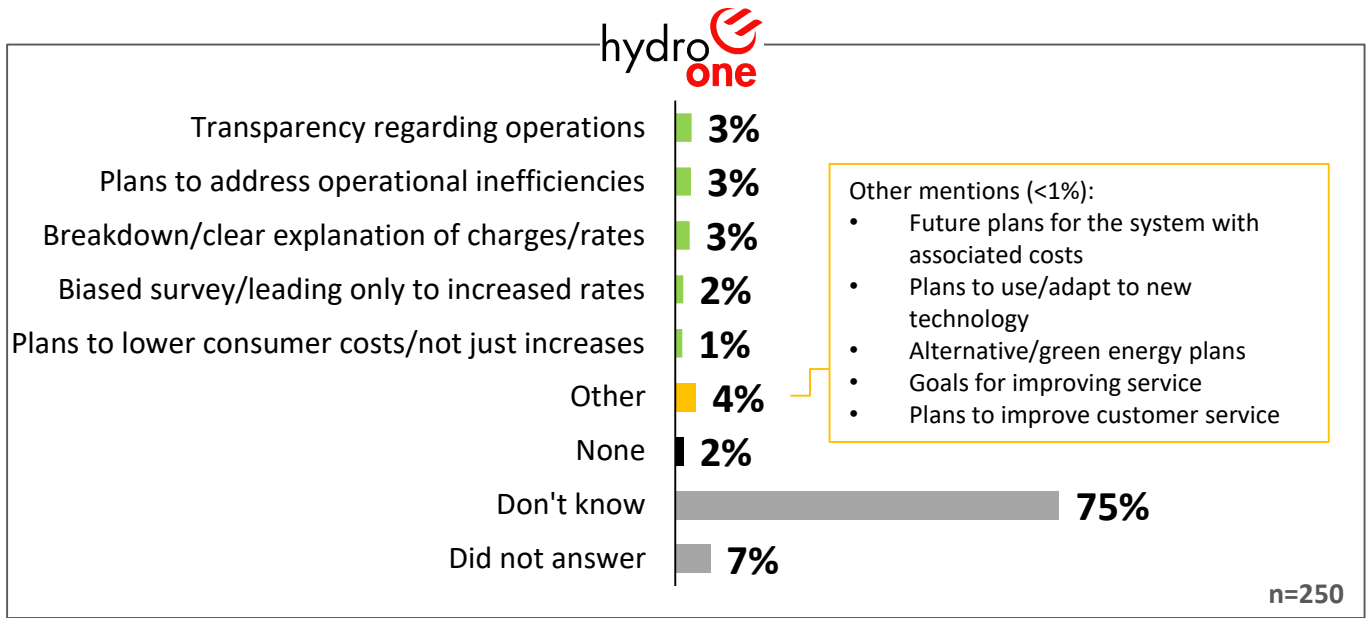
	Total	Southern	Central	Eastern	Northern
Too little information	9%	10%	5%	10%	8%
Just the right amount of information	76%	79%	76%	78%	65%
Too much information	15%	12%	20%	12%	27%



## Feedback on Hydro One's Customer Engagement

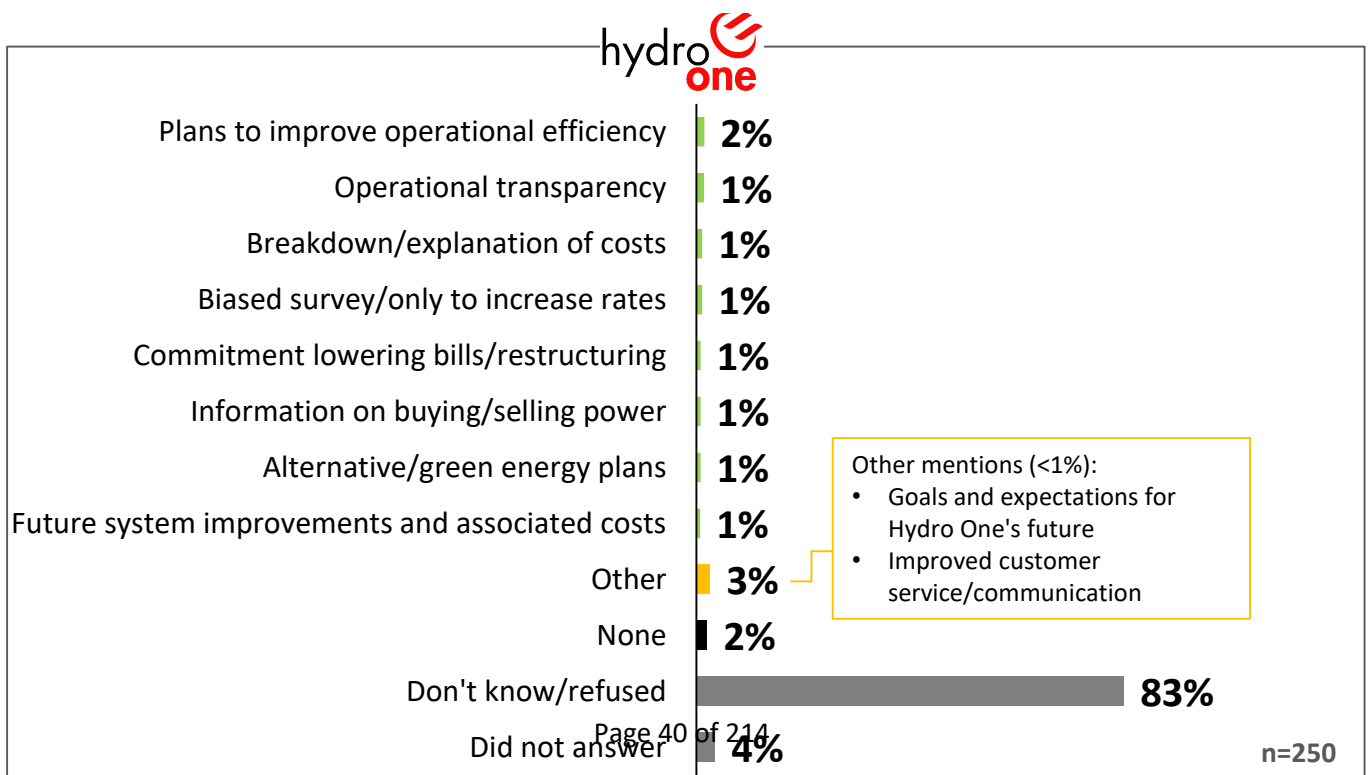
Q

Was there any content missing that you would have liked to have seen included in this workbook?



Q

Is there anything that you would still like answered?

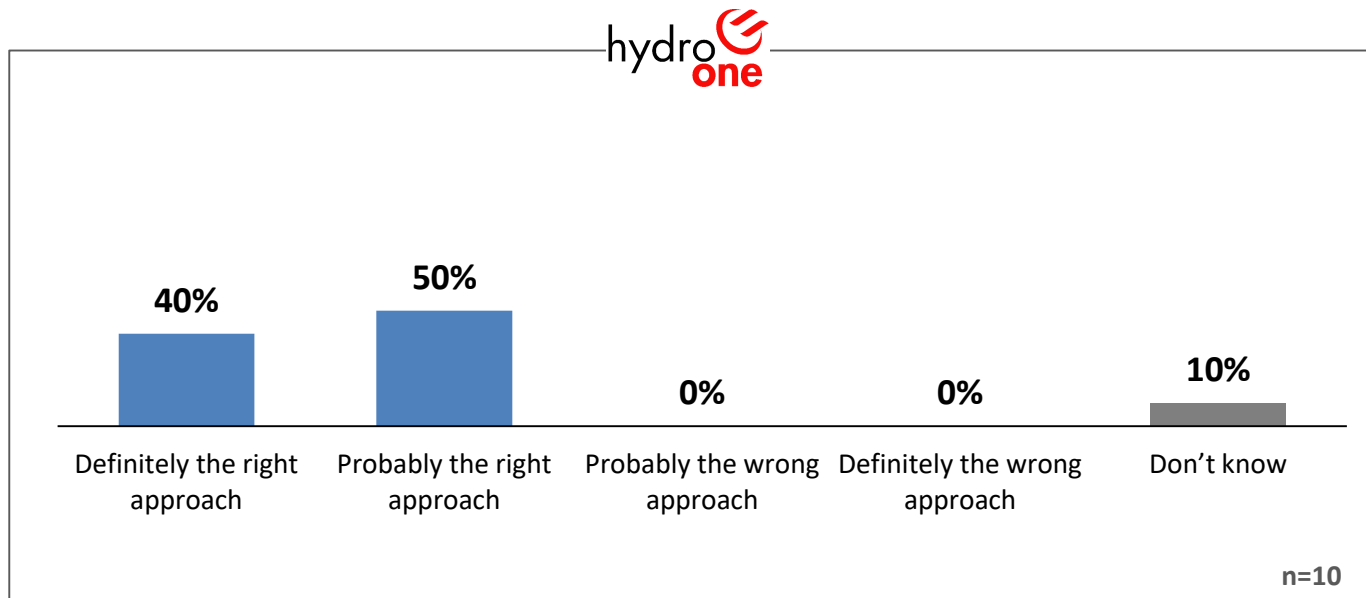




## How Does Hydro One Consider Customer Views in Its Plan?

Q

Does this customer engagement approach seem like the right approach or the wrong approach to bring customer needs and preferences into Hydro One's plan?



Note: Interpret values with caution, as sample size is very small.

Q

Is there anything in particular you would change about this approach or any other comments you would like to make?

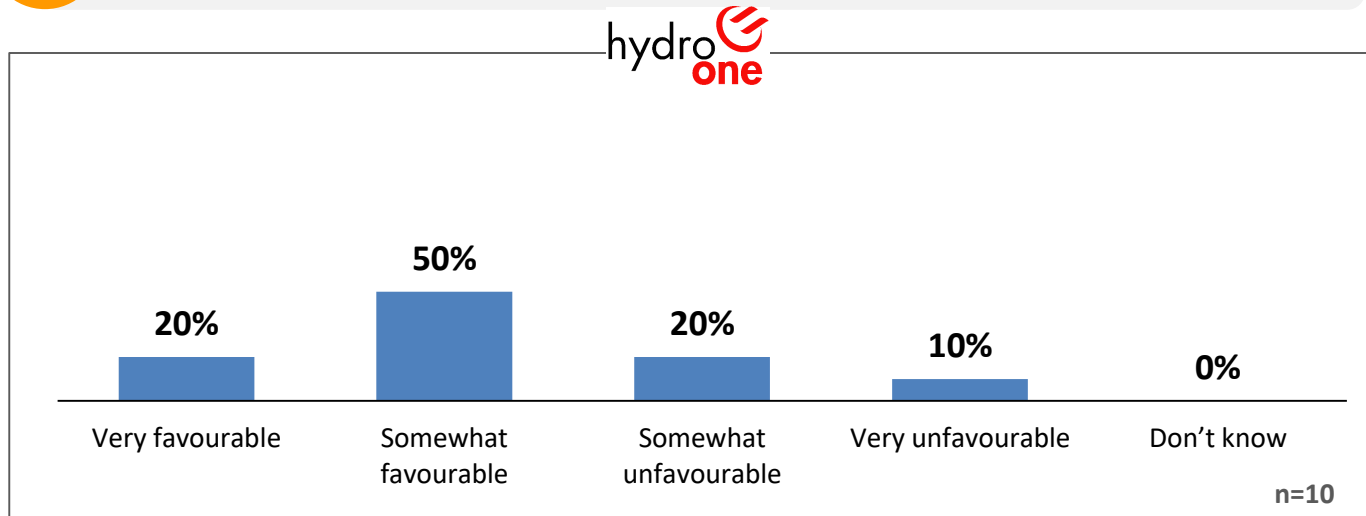
*"None I can think of at this time"*



## Feedback on Hydro One's Customer Engagement

Q

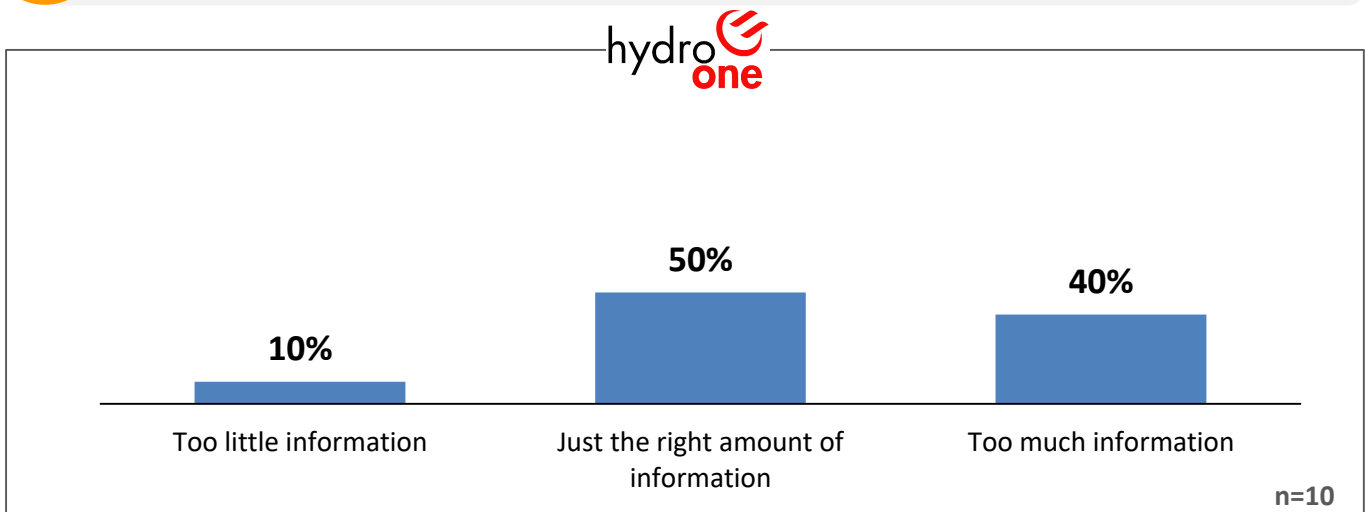
Overall, did you have a favourable or unfavourable impression of the workbook you just completed?



Note: Interpret values with caution, as sample size is very small.

Q

In this workbook, do you feel that Hydro One provided too much information, not enough, or just the right amount?



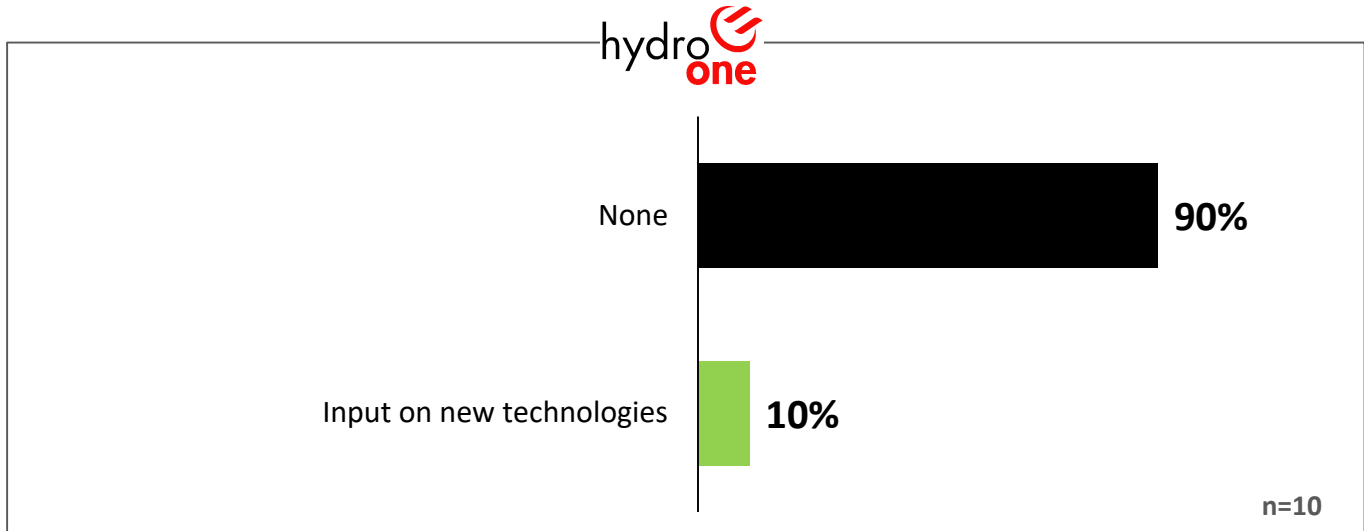
Note: Interpret values with caution, as sample size is very small.



## Feedback on Hydro One's Customer Engagement

Q

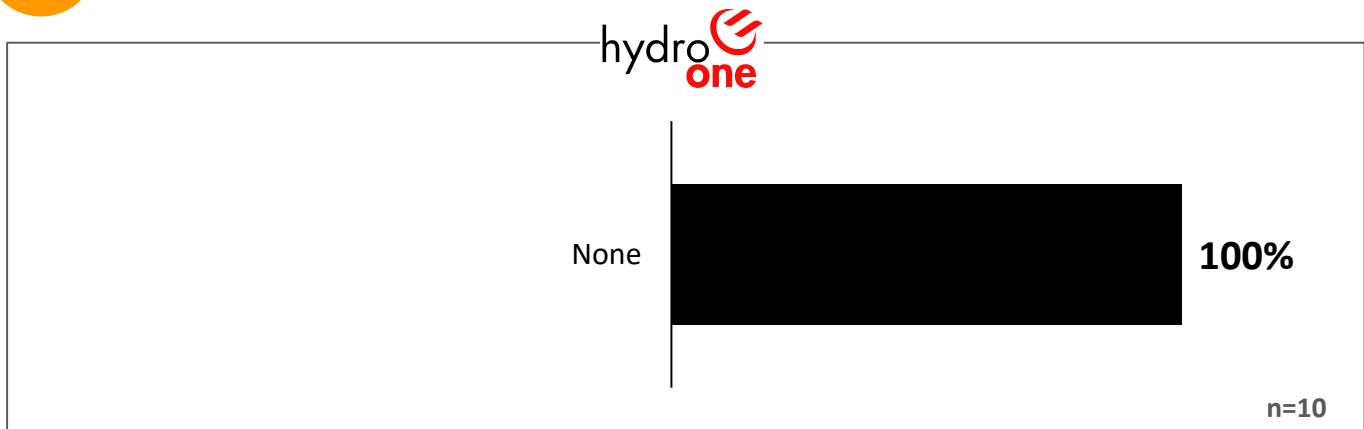
Was there any content missing that you would have liked to have seen included in this workbook?



Note: Interpret values with caution, as sample size is very small.

Q

Is there anything that you would still like answered?



Note: Interpret values with caution, as sample size is very small.

## Residential Customers

# Online Workbook Results





### Field Dates & Workbook Delivery

The **Residential Online Workbook** was sent to a random sub-sample of Hydro One residential customers who have provided the utility with an email address. Customers had an opportunity to complete the workbook between December 17<sup>th</sup>, 2019 and January 17<sup>th</sup>, 2020.

Each customer received a workbook using a unique URL that could be linked back to their annual consumption, region and rate class. In total, the residential workbook was sent to 19,364 Primary Residential and 7,299 Seasonal customers via e-blast from a Hydro One email address that is administered by INNOVATIVE.

### Residential Online Workbook Completes

A total of **1,520** (unweighted) Hydro One residential customers completed the online workbook via a unique URL. This includes Primary Residential (n=1,379) and Seasonal (n=141) customers. The combined weighted n-size for Residential customers is 1,338.

### Sample Weighting

The residential online workbook sample has been weighted proportionately by region and consumption quartiles in order to be representative of the broader Hydro One service territory.

*The table below summarizes the weighted sample breakdown by rate zone and quartile. For unweighted n-sizes, please consult Page 10 of this report.*

Weighted Sample	Consumption Quartiles				Total
	Low	Medium-Low	Medium-High	High	
Southern	6.5%	7.9%	7.7%	7.3%	29.4%
Central	6.2%	6.5%	6.9%	8.0%	27.6%
Northern	7.3%	7.6%	7.9%	6.8%	29.7%
Eastern	3.8%	3.3%	3.0%	3.2%	13.3%
<b>Total</b>	<b>23.8%</b>	<b>25.3%</b>	<b>25.5%</b>	<b>25.3%</b>	<b>100%</b>

**Note:** *Graphs and tables may not always total 100% due to rounding of numbers rather than any error in data. Sums are added before rounding numbers. Caution interpreting results with small n-sizes.*



### Welcome to Hydro One's Customer Engagement!

**Hydro One needs your input on choices that will impact the services you receive and the rates that you pay.**

- **Hydro One** is developing its investment plan for 2023 to 2027. This plan will determine the investments Hydro One will make in equipment and infrastructure, the services it provides, and the rates you pay.
- As **Hydro One** plans for the future, they must ensure their business decisions are aligned with customer priorities, preferences, and needs.
- **Hydro One** will be accountable to the public regulator, the Ontario Energy Board (OEB), both in terms of sharing what customers say and demonstrating how they considered those views.
- **You don't need to be an electricity expert** to participate in this engagement. This workbook is focused on basic choices and provides the background information you need to answer the questions.
- This customer engagement will take approximately 20-30 minutes to complete, depending on the level of feedback you wish to provide. Your progress will be saved as you move through the workbook, meaning you can leave and return to the customer engagement at any time.

**All individual responses will be kept confidential.** Innovative Research Group (INNOVATIVE), an independent research company, has been hired to gather your feedback.

**Those who complete the questions that follow will be invited to enter a draw to win one of ten (10) \$100 cash prizes.**

If you are reading this on a smaller mobile device, you may want to consider accessing the survey from a tablet, desktop or laptop instead so that it is easier for you to read.





### Hydro One's Role in Ontario's Electricity System

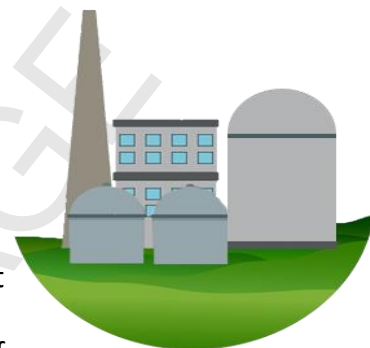
Ontario's electricity system is owned and operated by public, private, and municipal corporations across the province. It is made up of three key components: **generation**, **transmission** and **distribution**. Hydro One is involved in both electricity transmission across Ontario and distribution in many communities.

#### Generation

##### Where electricity comes from.

Ontario gets its electricity from a mix of energy sources. About half comes from nuclear power. The remainder comes from a mix of hydroelectric and natural gas, and to a lesser extent, wind and solar.

Ontario Power Generation, a government-owned company, generates almost half of Ontario's electricity. The other half comes from multiple generators who have contracts with the grid operator to provide power from a variety of sources.

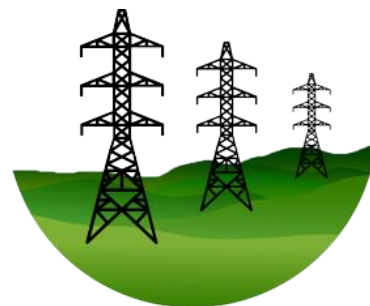


#### Transmission

##### Electricity travels across Ontario.

Once electricity is generated, it must be transported to urban and rural areas across the province. This happens by way of high voltage transmission lines that serve as highways for electricity. Often these lines are suspended on large, steel lattice towers. The province has more than 30,000 km of transmission lines, and almost all are owned by Hydro One.

Hydro One provides transmission services to most electricity customers in Ontario.

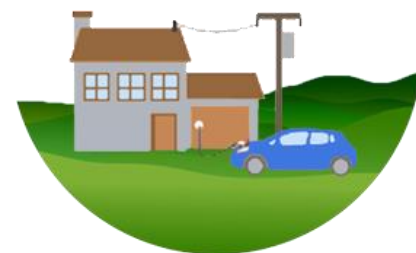
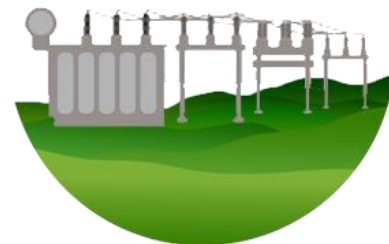


#### Local Distribution

##### Delivering power to homes and businesses in your community.

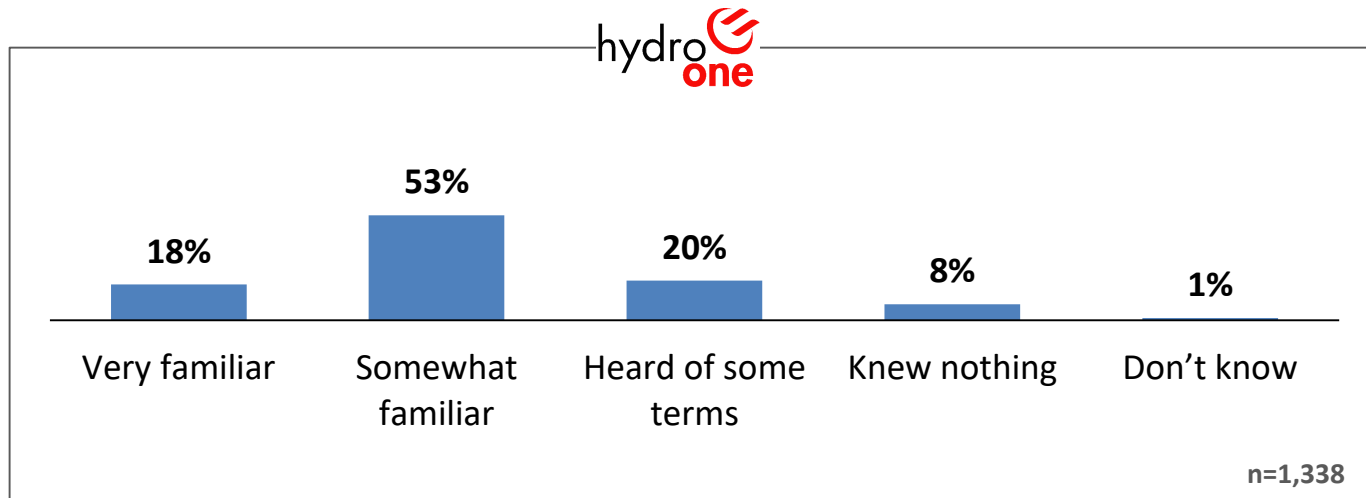
In many communities, Hydro One is also responsible for the last step of the journey: delivering electricity to customers through its distribution system. This local distribution system includes transformer stations that decrease the voltage of the electricity so it can be used safely in your home or business.

While there are many distributors across Ontario, Hydro One builds, operates and maintains this distribution system that serves you. Hydro One reads meters, calculates and collects bills for all parts of the electricity system and answers customer calls.





Before this survey, how familiar were you with the various parts of the electricity system and how they work together?



	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Very familiar and could explain the details	18%	18%	24%	16%	19%	20%	18%
Somewhat familiar with the system but could not explain all the details	53%	53%	54%	53%	54%	53%	51%
Had heard of some of the terms and organizations mentioned	20%	21%	15%	22%	18%	18%	22%
I knew nothing about how the provincial electricity system works	8%	8%	8%	8%	7%	7%	9%
Don't know	1%	1%	Page_48 of 214	1%	1%	2%	1%



## Who is Hydro One?

### Electricity 101

- Hydro One is Ontario's largest electricity transmission and distribution service provider.
- Hydro One is a publicly traded corporation. Its largest shareholder is the Government of Ontario.
- Hydro One is regulated by the Ontario Energy Board (OEB) and must apply to the OEB for approval of the amount it charges for its services.

### Hydro One's Transmission System

- Hydro One's transmission system takes electricity from generators (i.e. the Adam Beck facility at Niagara Falls or the Bruce Power nuclear power plant) and transports it via high-voltage transmission lines to local communities, where the voltage is lowered ("stepped-down") so you can use it in your home or business.
- Hydro One's transmission system serves 98% of electricity customers in Ontario.

### Hydro One's Distribution System

- Hydro One is also required by law to distribute electricity across Ontario to any customer not otherwise served by a local distribution company. This means that Hydro One's nearly 1.4 million customers are predominantly rural customers.
- Hydro One's local distribution system, which brings electricity to your home through a network of wires, poles and other equipment, covers approximately 75% of the geographic area of Ontario.
- Compared to other electricity distributors in the province, Hydro One's service territory is much larger and includes more rural and remote areas.

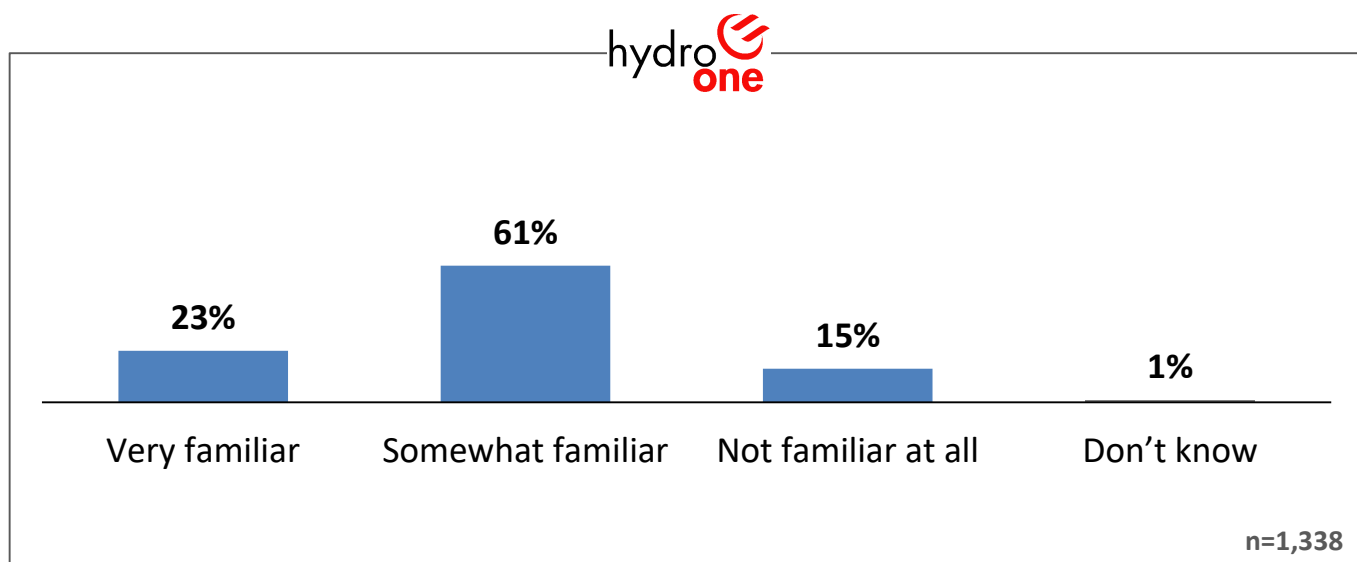




## Who is Hydro One?

Q

How familiar are you with Hydro One, which operates the transmission system across the province and the electricity distribution system in your community?



	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Very familiar	23%	22%	26%	22%	24%	23%	23%
Somewhat familiar	61%	61%	61%	62%	62%	60%	60%
Not familiar at all	15%	16%	13%	15%	14%	17%	16%
Don't know	1%	1%	-	1%	0%	0%	1%

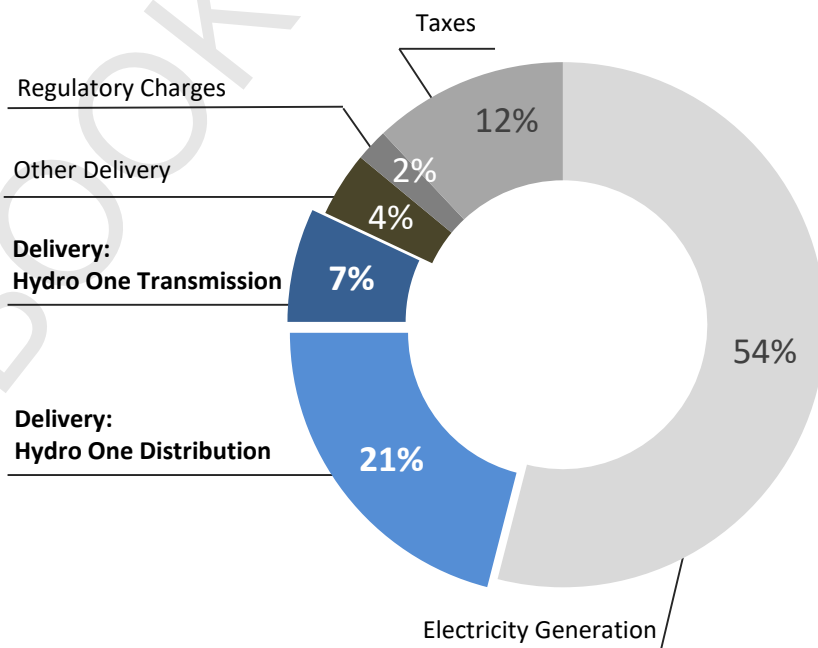


## How much of my bill goes to Hydro One?

### Electricity 101

- Every item and charge on your bill is mandated by the provincial government or regulated by the Ontario Energy Board (OEB), the provincial energy regulator.
- While Hydro One is responsible for collecting payment for the entire electricity bill, it only keeps about 28% or \$49.20 of the average residential customer's total electricity charges and HST (before the Ontario Electricity Rebate).
- This amount is split into 21% (\$36.90) for distribution, and 7% for transmission (\$12.30).
- The rest of the bill goes to power generation companies, taxes, and regulatory agencies.

**Breakdown of Monthly Bill**  
(before the Ontario Electricity Rebate)



### Hydro One Sample Monthly Bill\*

(Based on monthly usage of 750 kWh)

Account Number:  
000 000 000 000 0000

Meter Number:  
00000000

#### Your Electricity Charges

#### Electricity

Off-Peak @ 10.1 ¢/kWh	48.48
Mid-Peak @ 14.4 ¢/kWh	19.44
On-Peak @ 20.8 ¢/kWh	28.08

**Delivery** 56.11

Regulatory Charges 3.40

**Total Electricity Charges** \$155.51

HST 20.22

Ontario Electricity Rebate\* (-49.45)

**Total Amount** \$126.27

**Hydro One's  
portion of  
Delivery is  
\$49.20**

Regulatory Charges

Other Delivery

**Delivery:  
Hydro One Transmission**

**Delivery:  
Hydro One Distribution**

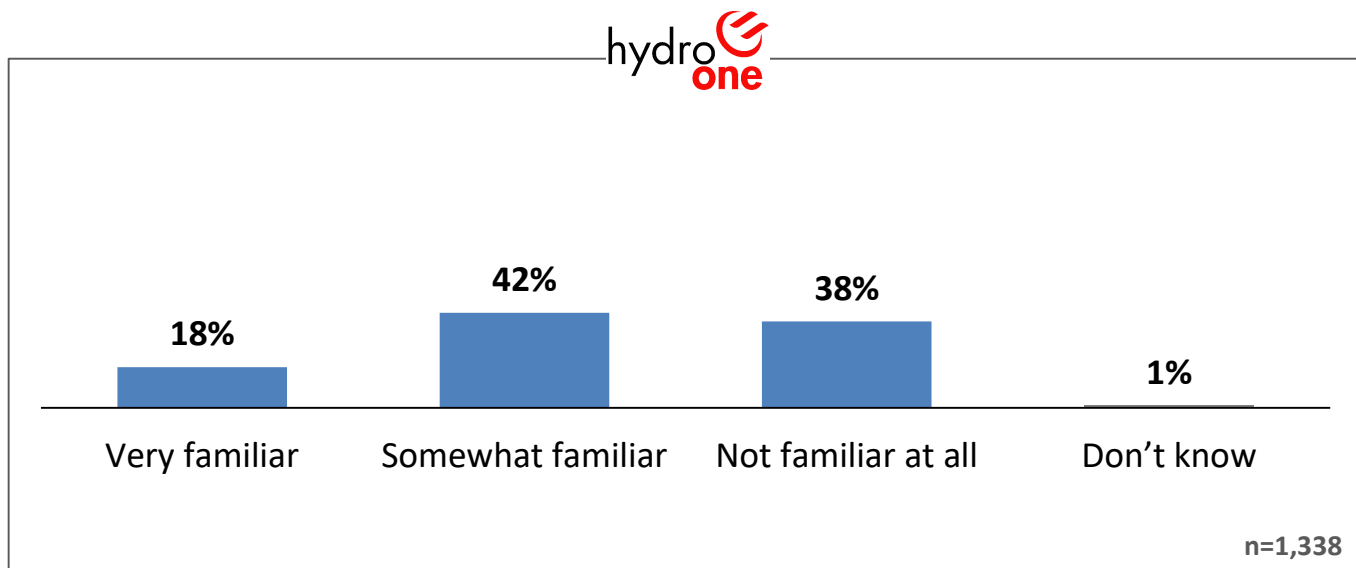
\*Since November 1, 2019, the Ontario Electricity Rebate (OER) is applied to bills for most residential consumers, farms and small businesses. The OER is a provincial rebate equal to 31.8% of the base invoice amount.



## How much of my bill goes to Hydro One?

Q

Before this survey, how familiar were you with the amount of your electricity bill that went to Hydro One?



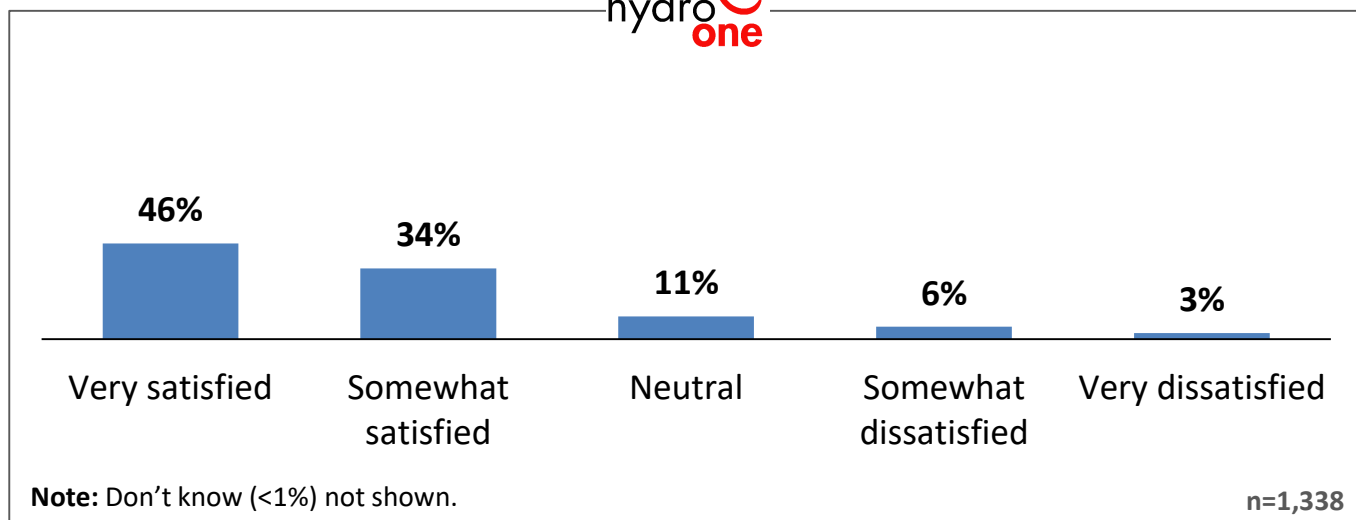
	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Very familiar	18%	17%	25%	19%	17%	19%	16%
Somewhat familiar	42%	43%	36%	44%	43%	41%	41%
Not familiar at all	38%	38%	39%	35%	40%	39%	42%
Don't know	1%	1%	-	1%	1%	1%	1%



## Satisfaction with Hydro One's Services

Q

Thinking specifically about the services provided to you and your community by Hydro One, overall, how satisfied or dissatisfied are you with the services that you receive?



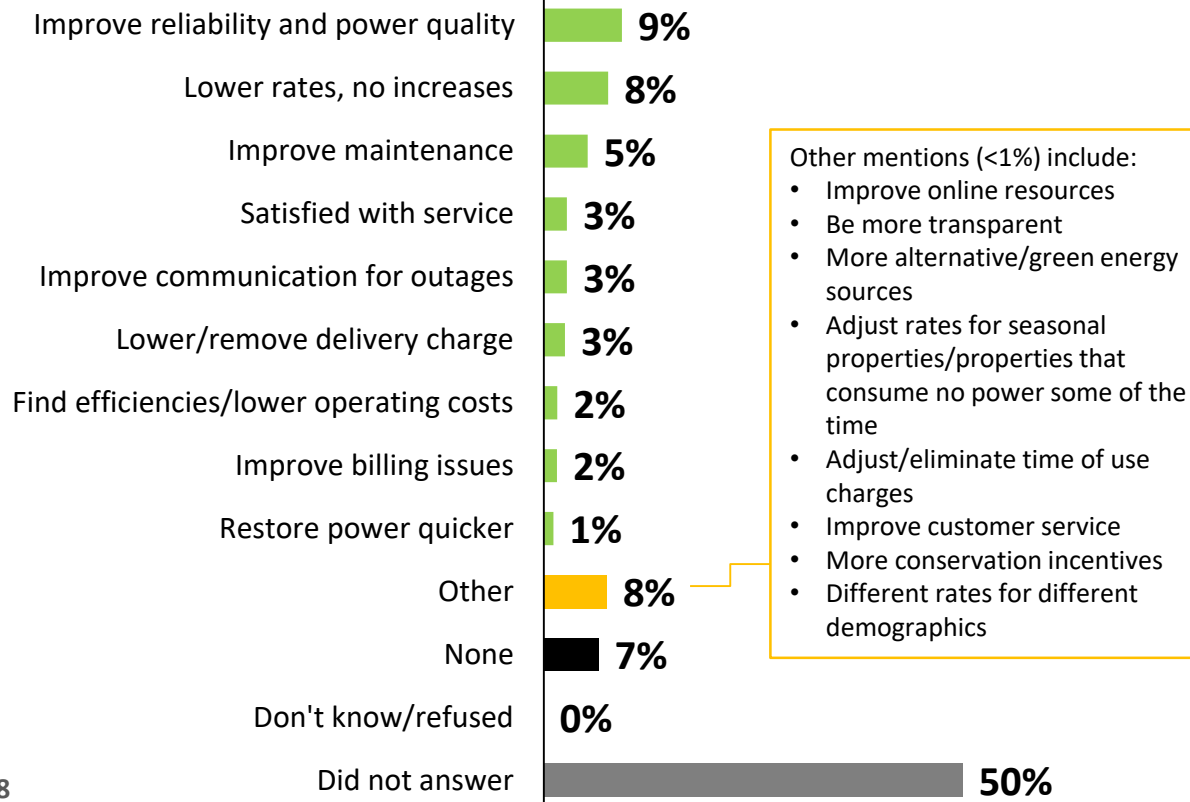
	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Very satisfied	46%	47%	35%	43%	46%	49%	45%
Somewhat satisfied	34%	33%	39%	34%	34%	34%	32%
Neutral	11%	11%	12%	13%	10%	10%	14%
Somewhat dissatisfied	6%	5%	9%	6%	7%	4%	7%
Very dissatisfied	3%	3%	5%	3%	4%	3%	2%
Don't know	0%	0%	-	0%	-	0%	-
<b>Overall satisfied</b>	<b>80%</b>	<b>80%</b>	<b>74%</b>	<b>78%</b>	<b>80%</b>	<b>83%</b>	<b>77%</b>
<b>Overall dissatisfied</b>	<b>9%</b>	<b>8%</b>	<b>14%</b>	<b>9%</b>	<b>11%</b>	<b>7%</b>	<b>9%</b>



## Satisfaction with Hydro One's Services

Q

Is there anything in particular you would like Hydro One to do to improve its services to you?



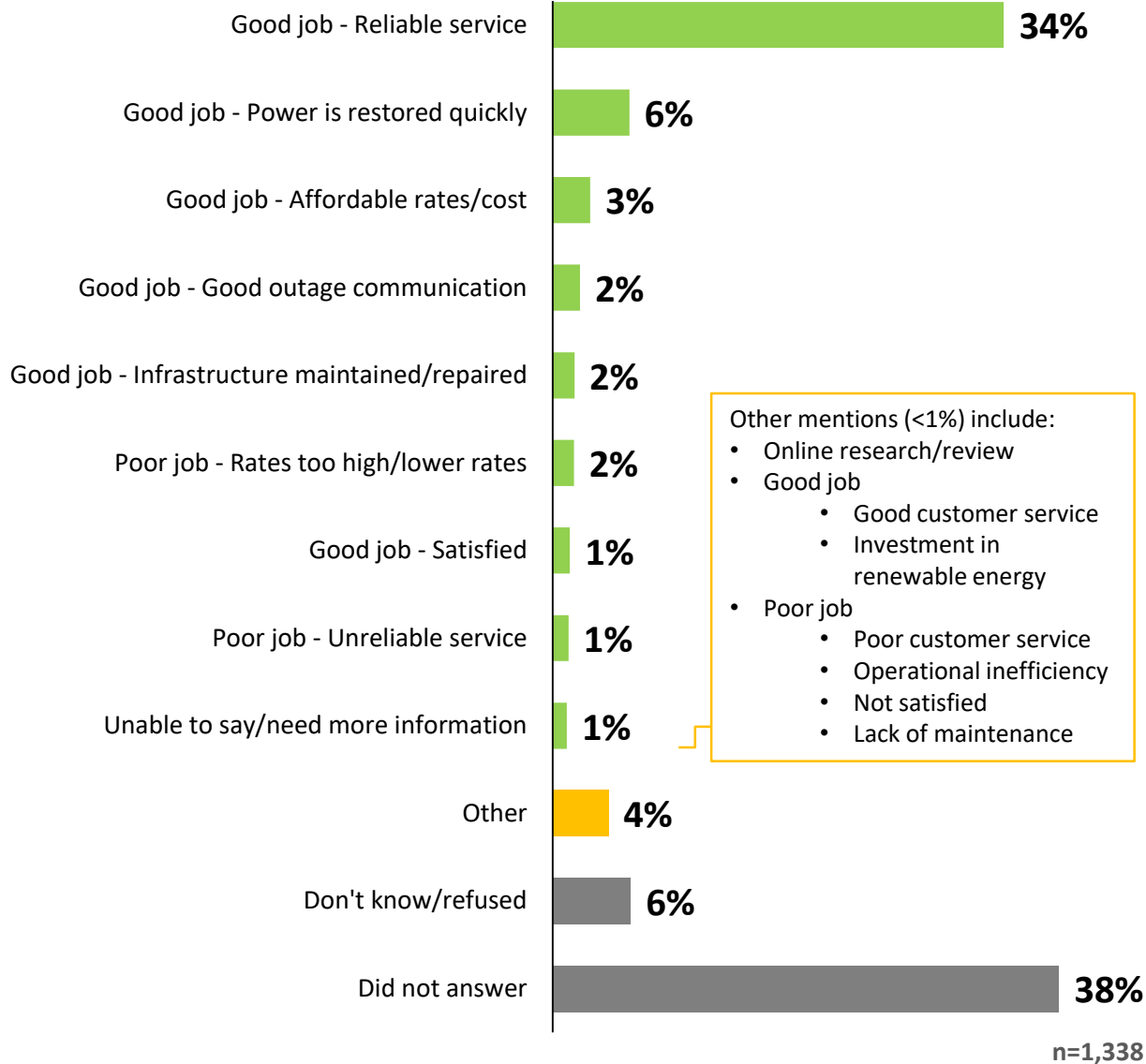
n=1,338

Needs	% agree the cost of my electricity bill has a major impact	% agree consumers are well served by the electricity system
Improve reliability and power quality	9%	8%
Lower rates, no increases	11%	7%
Improve maintenance	4%	5%
Satisfied with service	2%	3%
Improve communications for outages	3%	2%
Lower/remove delivery charge	4%	2%
Find efficiencies/lower operating cost	2%	1%
Improve billing issues	2%	1%
Restore power quicker	1%	1%





How do you know if Hydro One is doing a good job for you, or not?



# Online Workbook

## Outcome Priorities

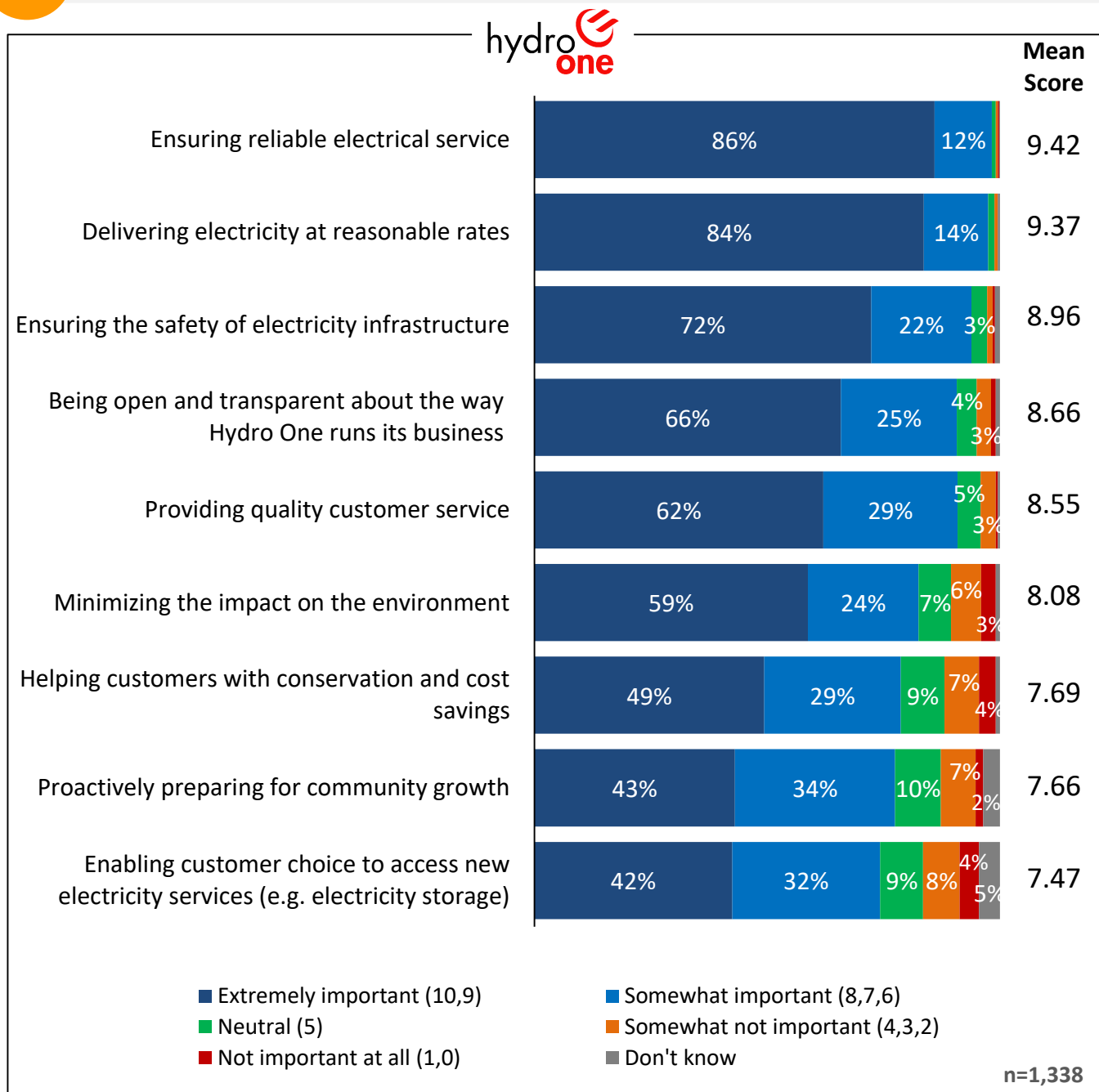
Residential



Through previous customer research and contacts, a number of outcomes were identified by customers as priorities for Hydro One. We would like to check that list with you to ensure it is complete. We also want to understand the priorities you give to different outcomes.

Q

How important are each of the following Hydro One priorities to you as a customer?





## Outcome Priorities

Through previous customer research and contacts, a number of outcomes were identified by customers as priorities for Hydro One. We would like to check that list with you to ensure it is complete. We also want to understand the priorities you give to different outcomes.



How important are each of the following Hydro One priorities to you as a customer?

**BY Mean Score**

	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Ensuring reliable electrical service	9.42	9.45	9.24	9.39	9.45	9.43	9.42
Delivering electricity at reasonable rates	9.37	9.38	9.32	9.34	9.40	9.36	9.42
Ensuring the safety of electricity infrastructure	8.96	9.00	8.66	9.00	8.91	8.93	9.03
Being open and transparent about the way Hydro One runs its business	8.66	8.68	8.44	8.66	8.58	8.67	8.77
Providing quality customer service	8.55	8.57	8.34	8.53	8.55	8.49	8.71
Minimizing the impact on the environment	8.08	8.10	7.86	8.00	8.15	8.05	8.18
Helping customers with conservation and cost savings	7.69	7.77	7.08	7.86	7.48	7.58	8.02
Proactively preparing for community growth	7.66	7.73	7.04	7.77	7.58	7.59	7.73
Enabling customer choice to access new electricity services (e.g. electricity storage)	7.47	7.53	6.98	7.57	7.54	7.28	7.53

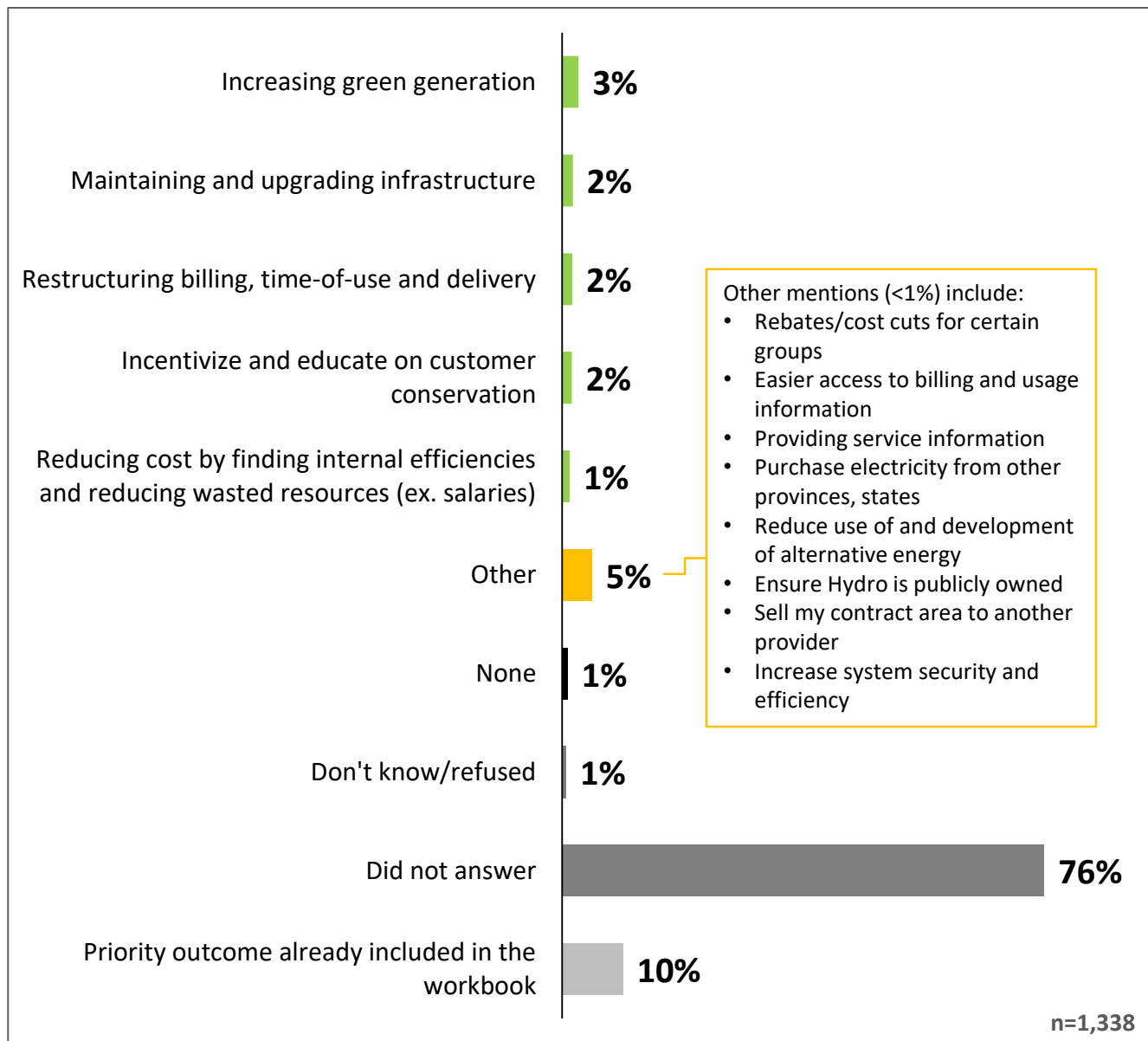


## Outcome Priorities

Through previous customer research and contacts, a number of outcomes were identified by customers as priorities for Hydro One. We would like to check that list with you to ensure it is complete. We also want to understand the priorities you give to different outcomes.

Q

The list above may not include all the outcomes that matter to you. Are there any other important priorities that Hydro One should be focusing on that weren't included in the list above?

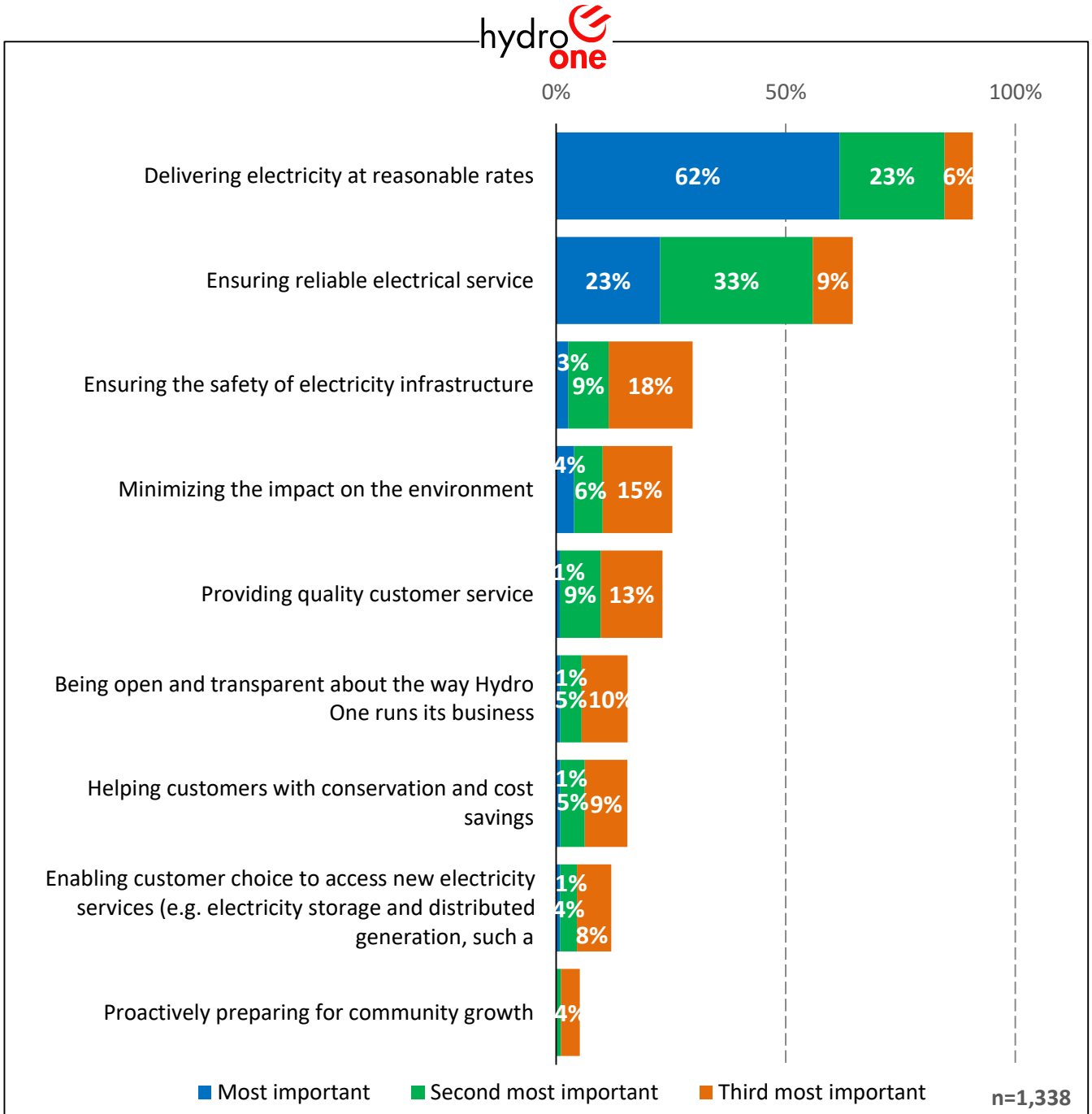




## Outcome Priorities

Q

Thinking again about the things Hydro One should be focusing on, please rank your top 3 priorities—where “1” would be the most important, “2” the second most important, and “3” the third most important.





Q

Now, let's talk about the reliability of electricity service you receive. Have you experienced any power outages at home in the past 12 months, which lasted longer than one minute? If so, approximately how many of these power outages did you experience?

	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
No outages	14%	14%	9%	16%	14%	14%	6%
1 outage	10%	11%	4%	10%	9%	13%	6%
2 outages	19%	20%	16%	19%	20%	20%	17%
3 outages	17%	17%	19%	18%	19%	17%	13%
4 outages	8%	9%	6%	8%	7%	9%	11%
5 outages	7%	7%	6%	5%	7%	6%	13%
6 outages	5%	5%	2%	6%	4%	3%	7%
7 outages	0%	0%	2%	1%	0%	-	2%
8 or more outages	7%	6%	15%	5%	8%	6%	9%
Don't know	12%	11%	20%	12%	12%	10%	16%

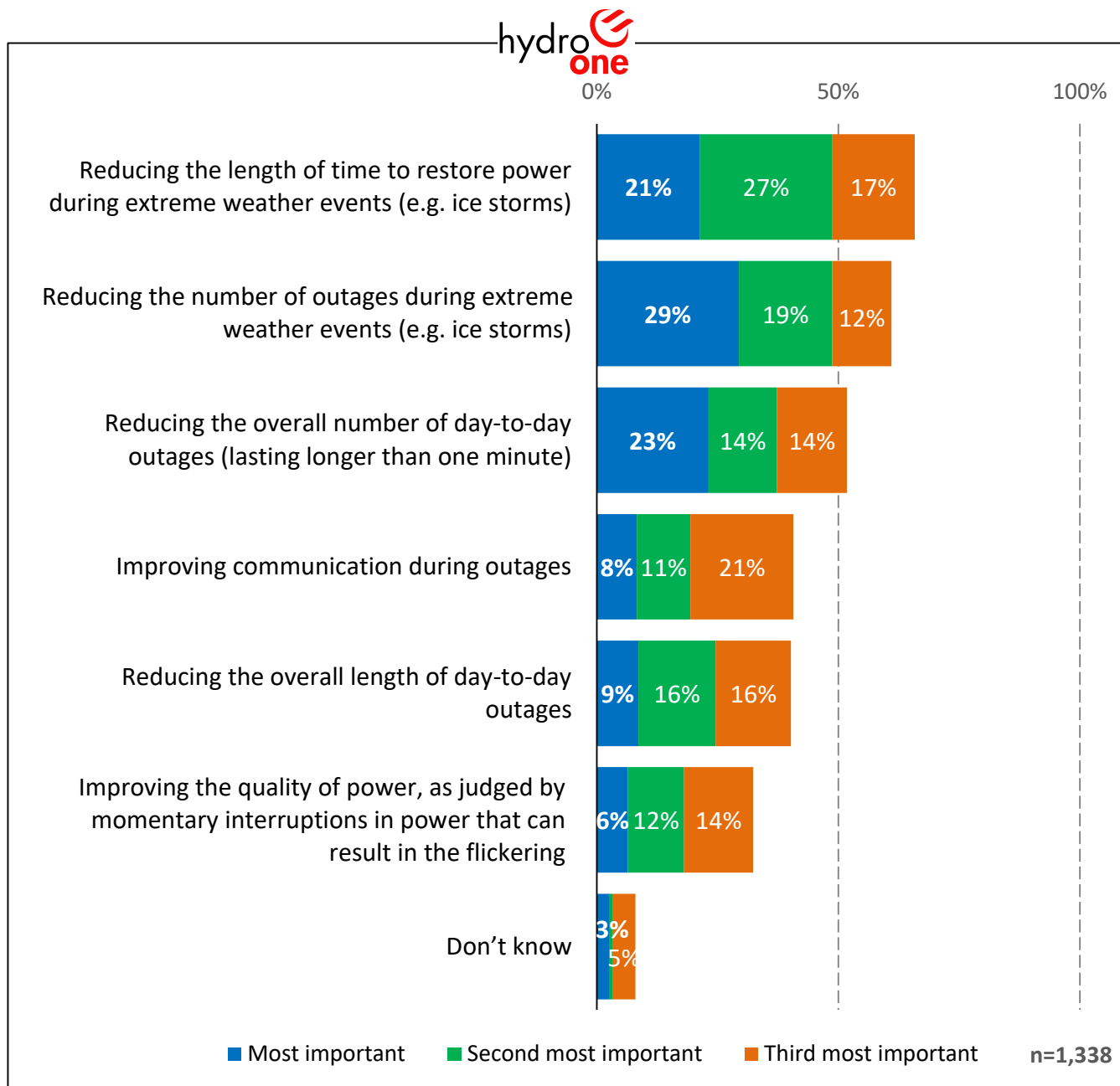


## Reliability Experience and Priorities

When it comes to reliability, there are a number of areas that Hydro One could focus on. For example, Hydro One could focus on improving day-to-day reliability and/or reducing interruptions during storms and other extreme weather.

Q

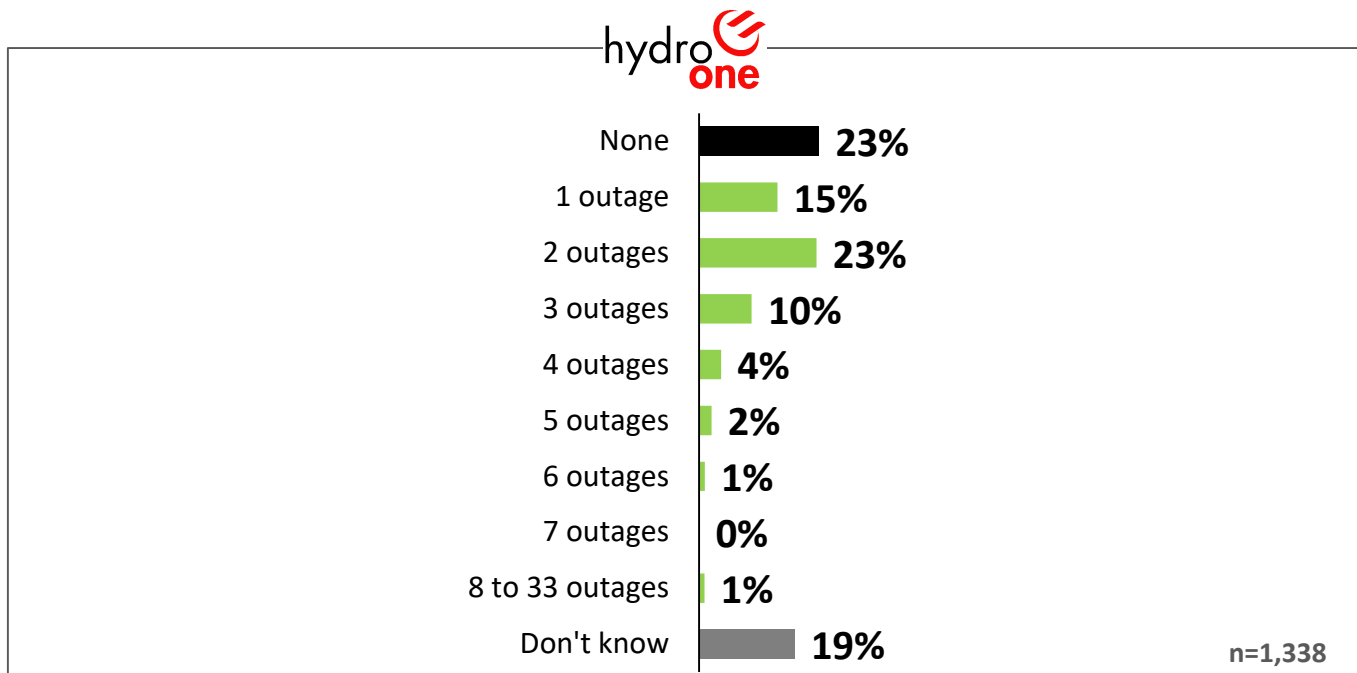
Among the following reliability outcomes, please rank your top 3 priorities—where “1” would be the most important, “2” the second most important, and “3” the third most important.





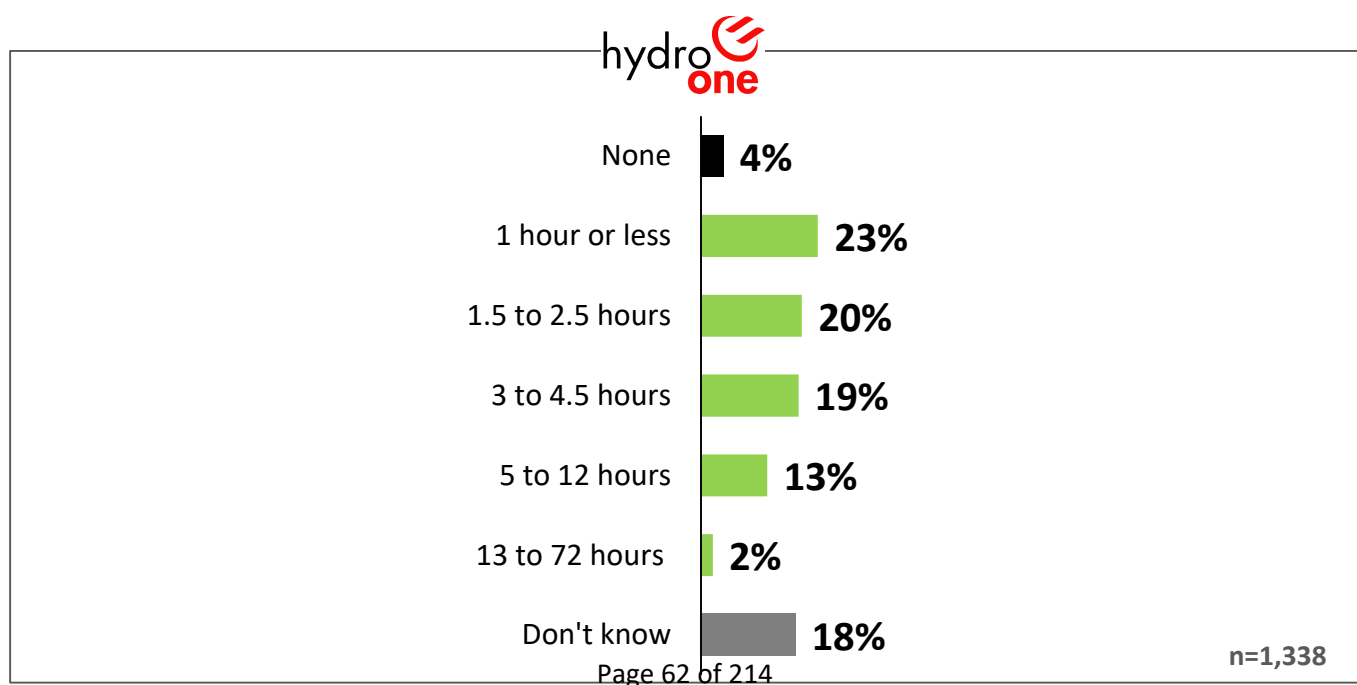
Q

What would you say is a reasonable number of outages that Hydro One customers should expect to experience every year?



Q

What would you say is a reasonable total length of outages that Hydro One customers should expect to experience every year?\*



Note: 'Other' and 'Refused' (<1%) not shown.





## Comparing Hydro One's Spending to Others

### Hydro One's Investment Plan

On a yearly basis, Hydro One's spending for the distribution side of the business is benchmarked by the OEB against other electricity distributors in Ontario.

Servicing more sparsely populated areas means that, compared to urban areas, more equipment (e.g. wooden poles, transformers and wires) is needed to serve the same number of customers.

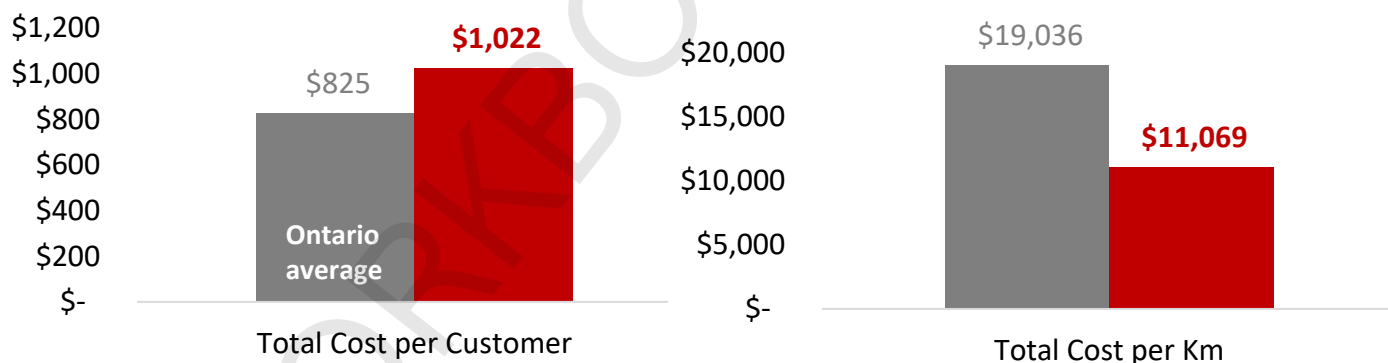
**On average, across Ontario 23 customers are served per kilometer of distribution line; in Hydro One's territory it is only 11 customers per kilometer.**

When we compare Hydro One to other electricity distributors, how well Hydro One compares depends on whether we look at cost per customer or cost per line km.

On a total cost per customer basis, it costs nearly \$200 more per customer for Hydro One to operate than the Ontario average. But when looking at the total cost per kilometer of distribution line, Hydro One's costs are \$8,000 below the Ontario average.

### Comparing Hydro One to Other Electricity Distributors (2018)

Source: 2018 OEB Benchmarking Report





## Comparing Hydro One's Spending to Others

**Benchmarking isn't the only way that Hydro One measures its operational efficiency.**

Like most businesses, Hydro One manages its spending in two budgets – a **capital budget** and an **operating budget**.

Its **capital budget** covers items that, once purchased, have lasting benefits over many years. This includes much of the equipment that is part of the distribution and transmission systems, such as poles, wires, cables, transformers, computers and information systems, vehicles and facilities.

**This phase of the engagement is focused on collecting your views on competing trade-offs in capital investments. These will be presented on the following pages.**

Hydro One's **operating budget** covers recurring expenses, such as the maintenance of equipment and the cost of customer service and billing.

In Hydro One's last rate application, the OEB limited the rate of Hydro One's annual operating cost increases by an amount that is less than inflation to incent the company to find ways of achieving the same outcomes for less money. Since 2015, Hydro One's operating costs have fallen by 4%.

The OEB runs an open and transparent review process where experts from the Ontario Energy Board (OEB) and intervenor groups review and challenge every dollar that Hydro One proposes to spend. Detailed discussion of Hydro One's operating budget is left to experts from the OEB and intervenors in the formal rate application review.

**Detailed questions about Hydro One's operating expenses will not be asked in this phase of the customer engagement.**

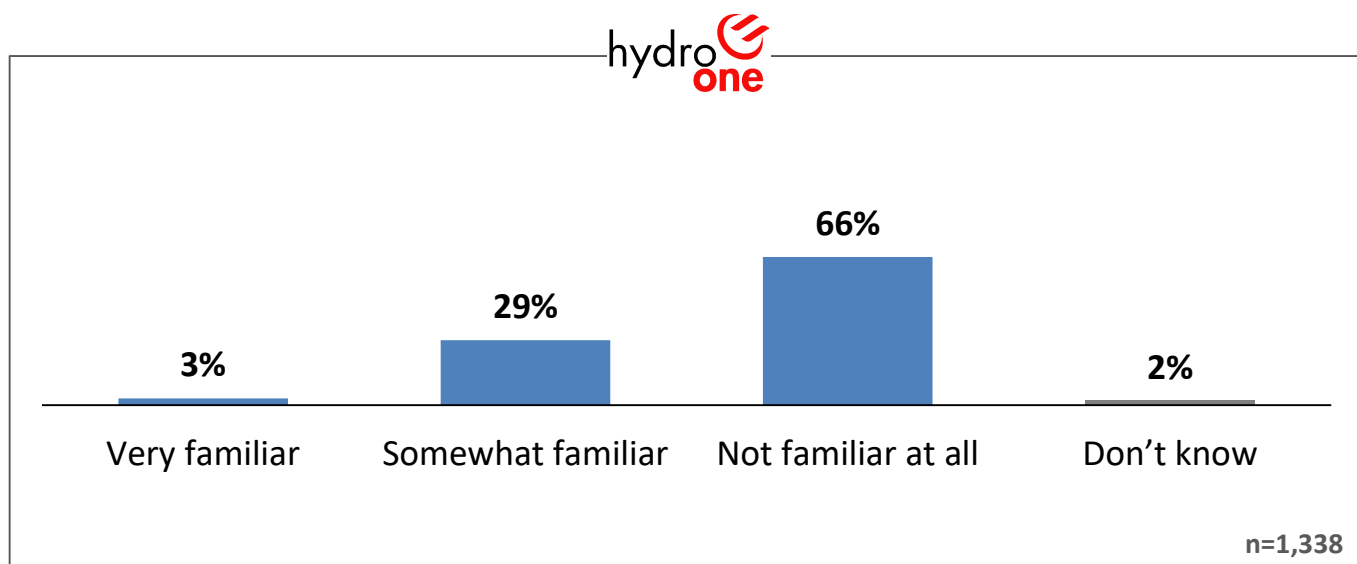
If you are interested in commenting on Hydro One's operating expenses, you are encouraged to participate in the OEB process when Hydro One files this application in 2021. Details will be available at that time at [oeb.ca/participate](http://oeb.ca/participate).



## Comparing Hydro One's Spending to Others

Q

Before this survey, how familiar were you with the OEB review process and the requirement for Hydro One to find operating savings every year?



	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Very familiar	3%	3%	6%	3%	3%	4%	3%
Somewhat familiar	29%	28%	34%	29%	29%	27%	31%
Not familiar at all	66%	66%	60%	67%	65%	67%	64%
Don't know	2%	2%	1%	1%	2%	2%	2%



## Comparing Hydro One's Spending to Others

Q

Before this survey, how familiar were you with the OEB review process and the requirement for Hydro One to find operating savings every year?

### Additional Comments (n=90)

93% of respondents did not provide additional feedback

n-size

Additional Comments (n=90)	n-size
93% of respondents did not provide additional feedback	
Inefficiencies in operation, especially salaries	18
Need more info / didn't understand survey / critical of survey	11
Prices are too high, not decreasing	11
Hydro One's varied demographic needs to be accounted for regarding service and billing	9
OEB is not trustworthy or effective	9
Make operation costs and comparisons with other providers available	8
Improved reliability is most important, even if bills increase	4
Maintain and improve infrastructure before it becomes more expensive	3
General positive comments	3
OEB is not strong enough when enforcing requirements	2
Increase budget from profits, not by raising customers bills	1
Other	7
None	2
Don't know	1



## Keeping Pace with Aging Distribution Infrastructure

Making Choices for Hydro One's Distribution System

**First, we would like to speak to you about Hydro One's distribution system.**

Most of Hydro One's distribution infrastructure (e.g. equipment like wooden poles, power transformers, and submarine cables) is now roughly 60 to 70 years old. Eventually, aging equipment deteriorates and has to be replaced to mitigate reliability, safety and environmental risks.



Hydro One has some control over when to make those investments.

Hydro One's **current approach** is to replace only the most critical aging equipment before it stops working. While Hydro One replaces aging equipment before it poses a safety, environmental or reliability risk, this still leaves 24% of station transformers and about 5% wooden poles currently in poor condition. Under Hydro One's current approach, the number of poles and station transformers in poor condition gets larger each year.

Hydro One's planners have identified **four options** for replacing aging equipment: Hydro One can continue its current level of investment, it can invest less, it can invest more to keep the percentage of aging equipment constant, or it can invest more to improve the percentage of aging equipment.

**Investing less** now would keep rate increases lower in the short term, but would lead to steeper rate increases in the future, as more equipment would need to be replaced later.

**Investing more** now, would mean higher rate increases now, but lower rate increases in the future, as Hydro One would replace more of its aging infrastructure now.

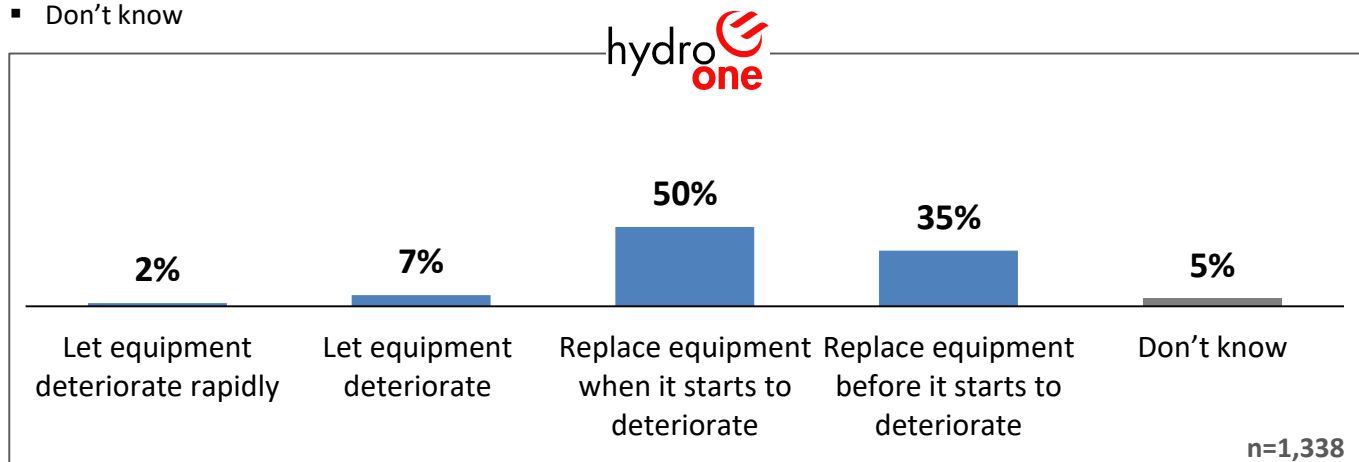


## Keeping Pace with Aging Distribution Infrastructure

Q

Which of the following statements best represents your point of view regarding Hydro One's approach to dealing with aging infrastructure?

- **Let Equipment Deteriorate Rapidly:** Hydro One should **decrease its current level of investment** in aging equipment to keep annual rate increases for new equipment [**under a dollar/under \$0.75**] on my monthly bill, even if it means the share of aging equipment will grow rapidly and future rate increases will be very steep.
- **Let Equipment Deteriorate:** Hydro One should **maintain its current level of investment** in aging infrastructure to keep annual rate increases for new equipment [**under \$1.50/under \$1**] on my monthly bill, even if it means equipment will age faster than it is replaced (but less quickly than in the scenario above) and future rate increases will be steep.
- **Replace Equipment When It Starts to Deteriorate:** Hydro One should **increase its current level of investment** in aging infrastructure to keep annual rate increases for new equipment [**under \$2/under \$1.5**] on my monthly bill, to keep pace with aging equipment and enable smoother rate increases in the future.
- **Replace Equipment Before It Starts to Deteriorate:** Hydro One should **increase its current level of investment** in aging equipment to keep annual rate increases for new equipment [**under \$2.50/under \$2**] on my monthly bill, which will improve the average age of equipment and enable stable rate increases in the future.
- Don't know



	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Let equipment deteriorate rapidly	2%	2%	2%	2%	3%	2%	1%
Let equipment deteriorate	7%	8%	6%	9%	7%	7%	8%
Replace equipment when it starts to deteriorate	50%	49%	56%	50%	49%	50%	53%
Replace equipment before it starts to deteriorate	35%	35%	32%	35%	35%	36%	33%
Don't know	5%	6%	4%	4%	7%	6%	6%

Note: Bill impact is shown as [bill impact for primary/seasonal customers].



Q

Which of the following statements best represents your point of view regarding Hydro One's approach to dealing with aging infrastructure?

### Additional Comments (n=187)

86% of respondents did not provide additional feedback

n=size

Additional Comments (n=187)	n=size
86% of respondents did not provide additional feedback	
Replace equipment after getting it's value, but before it becomes a problem	28
Decrease operation costs, salaries/alternative financing etc.	25
Preventative maintenance	24
Customers shouldn't pay more/extra for maintenance and upgrades	19
Consider cost	17
New underground lines/alternative materials for poles	16
Be proactive	9
Better and more reliable electricity	9
Tech/equipment improvements	7
Be transparent and accountable with plans and spending	6
Safety is paramount	4
Make it easy for customers to report issues	2
Other	16
None	2
Don't know	4

# Online Workbook

## Ensuring Day-to-Day Reliability

Residential



### Making Choices for Hydro One's Distribution System

As previously mentioned, Hydro One's service territory is much larger and includes more rural areas than those of other electricity distributors in Ontario. Due to this geography, Hydro One's distribution system looks different than other distribution systems in Ontario.

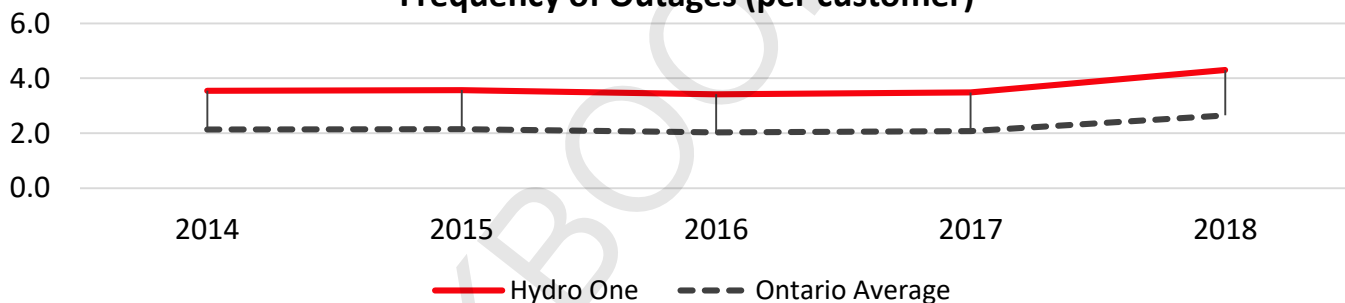
When Hydro One's system was first built, simple *radial lines* were constructed in rural areas. A radial line has only one power source for a group of customers. A power failure, short-circuit, or a downed power line interrupts power for all customers further down the line. While a *looped line* can restore power by bringing it in from another direction, power cannot be restored in a radial line until the source of the outage is found and repaired.

Compared to other local distribution companies, Hydro One now has more of those radial lines. They are less reliable than looped lines, which are standard in denser urban areas.

Hydro One tracks both the average number of power outages per customer and how long those outages last. The average Hydro One customer experiences more frequent and longer outages than the average Ontarian.

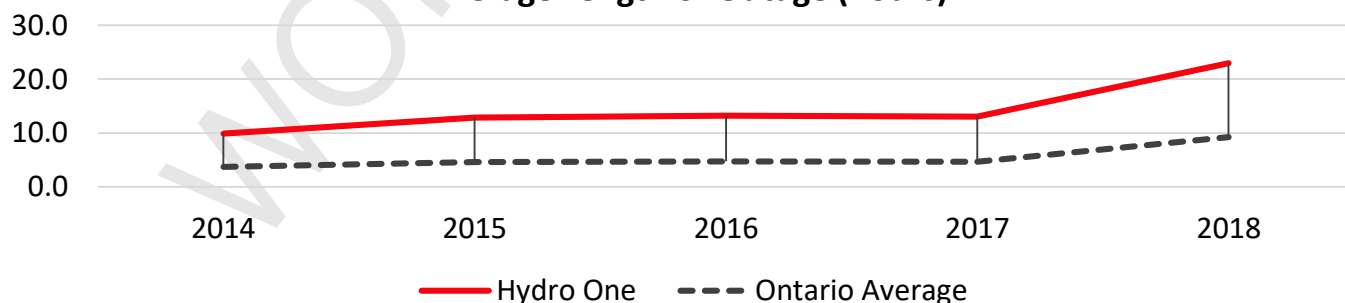
On average, between 2014 and 2018, the typical Hydro One customer has experienced 1.5 more outages per year compared to the Ontario average.

**Frequency of Outages (per customer)**



When it comes to total time spent without electricity each year, the typical Hydro One customer, since 2014, has been without power for 14.4 hours each year. That is 9 hours more than the Ontario average.

**Average Length of Outage (hours)**



There are investments that Hydro One can make to improve reliability, especially of radial lines, such as remote monitoring, remotely operable equipment and battery storage. While these investments are likely to reduce both the number and length of outages, they would add to the costs of the system.



# Online Workbook

## Ensuring Day-to-Day Reliability

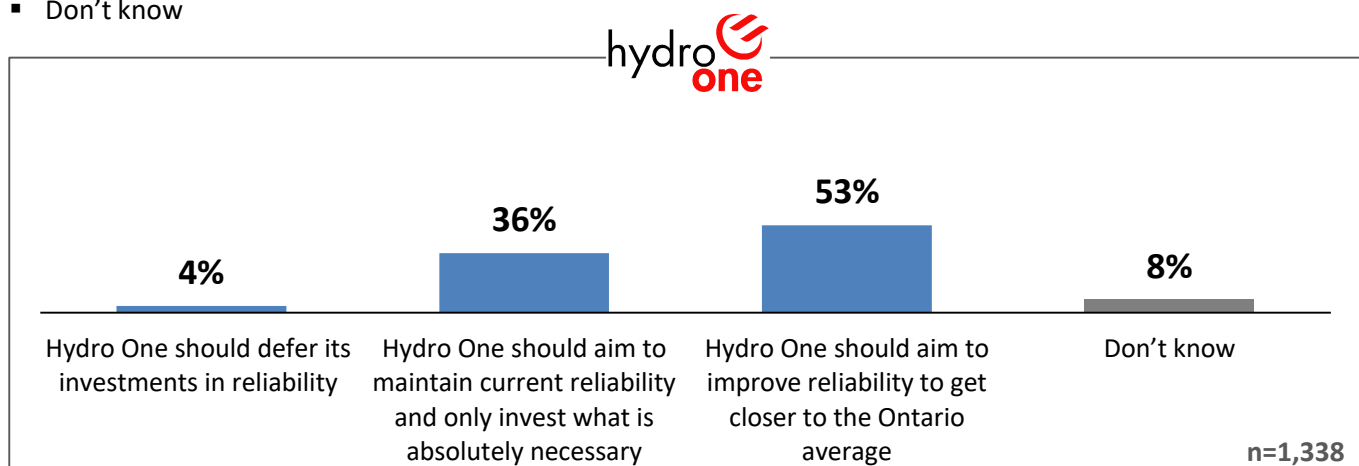
Residential



Q

Which of the following statements best represents your point of view regarding Hydro One's approach to ensuring day-to-day reliability?

- Hydro One should defer its investments in reliability to keep costs down, even if this could lead to more or longer power outages in the future.
- Hydro One should aim to maintain current reliability and only invest what is absolutely necessary to maintain the current level of reliability, even if that increases my monthly bill by **less than a dollar** each year.
- Hydro One should aim to improve reliability to get closer to the Ontario average, even if that increases my monthly bill by **more than a dollar** each year.
- Don't know



	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Hydro One should defer its investments in reliability	4%	5%	3%	4%	5%	4%	5%
Hydro One should aim to maintain current reliability and only invest what is absolutely necessary	36%	36%	35%	35%	36%	36%	36%
Hydro One should aim to improve reliability to get closer to the Ontario average	53%	52%	54%	54%	52%	52%	52%
Don't know	8%	8%	7%	7%	8%	8%	7%

# Online Workbook

## Ensuring Day-to-Day Reliability

Residential



Q

Which of the following statements best represents your point of view regarding Hydro One's approach to ensuring day-to-day reliability?

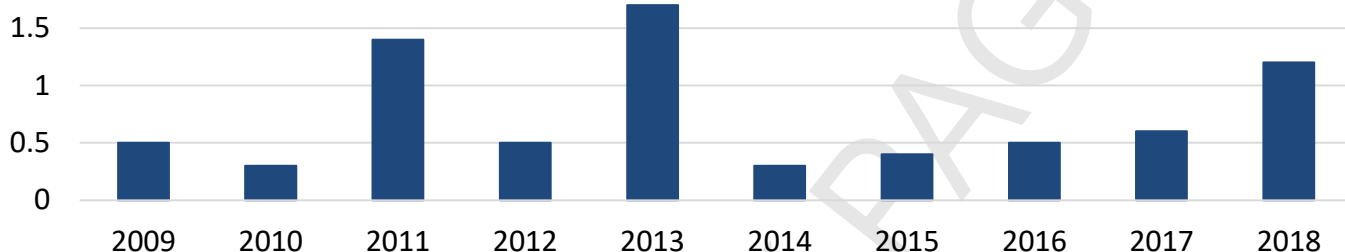
<b>Additional Comments (n=143)</b> 89% of respondents did not provide additional feedback	<b>n-size</b>
Find internal efficiencies	23
Be transparent with plans	16
Reduce costs, no increases	14
Use profits, customers should not pay	12
Differentiate billing between urban and rural customers	11
Improve reliability, value safety over cost	11
Biased questionnaire	10
Investment improvements necessary	8
Minor outages acceptable	6
Incentivize customers adopting generation/energy conservation	5
Protect/strengthen infrastructure	3
Maintenance should have been ongoing	3
Upgrade infrastructure only when necessary	2
Undertake preventative maintenance	2
Be proactive, it will only cost more in future	2
Look into alternative energy sources	2
Consider climate change, extreme weather events	2
Other	6
None	2
Don't know/refused	3



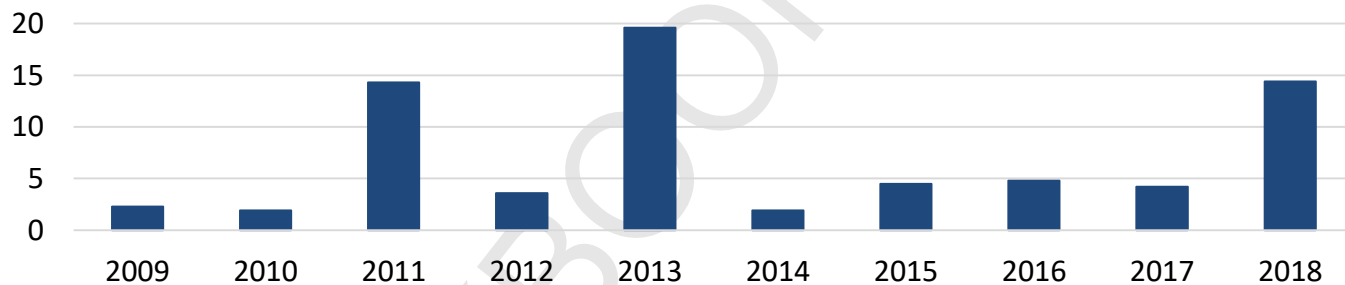
### Making Choices for Hydro One's Distribution System

Over the past ten years, severe weather, such as ice storms, windstorms or thunderstorms, has caused multiple outages that tended to last longer than regular day-to-day outages. In 2018, the average Hydro One customer was without power for an average total of 7 hours due to day-to-day outages. When the effect of storms are included, the total average duration was 23 hours for the average Hydro One customer.

#### Frequency of Outages (per customer) Caused by Severe Weather



#### Average Duration of Outages (hours) Caused by Severe Weather



The occurrence and severity of weather events are largely unpredictable. The number and duration of outages caused by severe weather have varied year-by-year.

Currently, Hydro One does not have a designated program to focus on minimizing the impacts of severe weather. However, there are investments Hydro One could make to make the system more resilient to help mitigate the potential impacts of severe weather. These types of investments could include building infrastructure to a higher, more redundant standard.

Any investments Hydro One would make would be based on previous experience and estimates of future major events. However, because major events are unpredictable, these investments may not match the events Hydro One actually experiences.

# Online Workbook

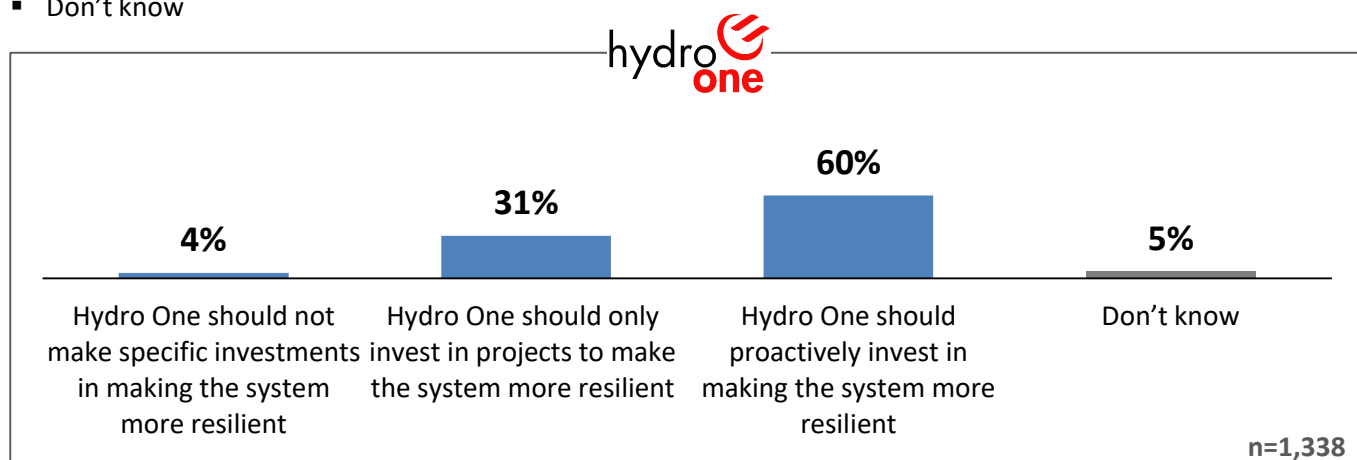
## Responding to Severe Weather

Residential



Q Which of the following statements best represents your point of view?

- In order to keep rates down, Hydro One should not make specific investments in making the system more resilient to severe weather, even if that means no improvements or potential increases in the length and number of outages caused by severe weather.
- Hydro One should only invest in projects to make the system more resilient to severe weather as part of the ongoing replacement of old or failing equipment, but not more, even if that increases my monthly bill by **less than 25 cents** each year.
- Hydro One should proactively invest in making the system more resilient in order to reduce the length and number of outages caused by severe weather, even if that increases my monthly bill by **less than 50 cents** each year.
- Don't know



	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Hydro One should <u>not</u> make specific investments in making the system more resilient	4%	4%	4%	4%	5%	5%	2%
Hydro One should only invest in projects to make the system more resilient	31%	31%	31%	29%	29%	32%	34%
Hydro One should proactively invest in making the system more resilient	60%	61%	59%	62%	62%	59%	58%
Don't know	5%	5%	5%	5%	5%	4%	6%

# Online Workbook

## Responding to Severe Weather

Residential



Q Which of the following statements best represents your point of view?

<b>Additional Comments (n=129)</b>	<b>n-size</b>
90% of respondents did not provide additional feedback	
Protect and strengthen infrastructure, especially burying lines	21
Consider climate change, more severe weather, environment	16
Find efficiencies to reduce cost in operations, especially salaries	14
Investment in improvement is necessary, even if it costs	12
Survey is leading, just about raising bills, otherwise critical of survey	10
Reduce cost for customer	10
Improve service reliability	6
Use profits to improve system, not higher bills	5
Incentivize customers adopting generation, conservation methods	4
Upgrade infrastructure when it needs to be replaced	3
Be transparent with plans for system and associate costs	3
Replace things before they cause problems, become more expensive	1
Perform preventative maintenance	1
Alternative, green energy sources	1
Other	10
None	11
Refused	3

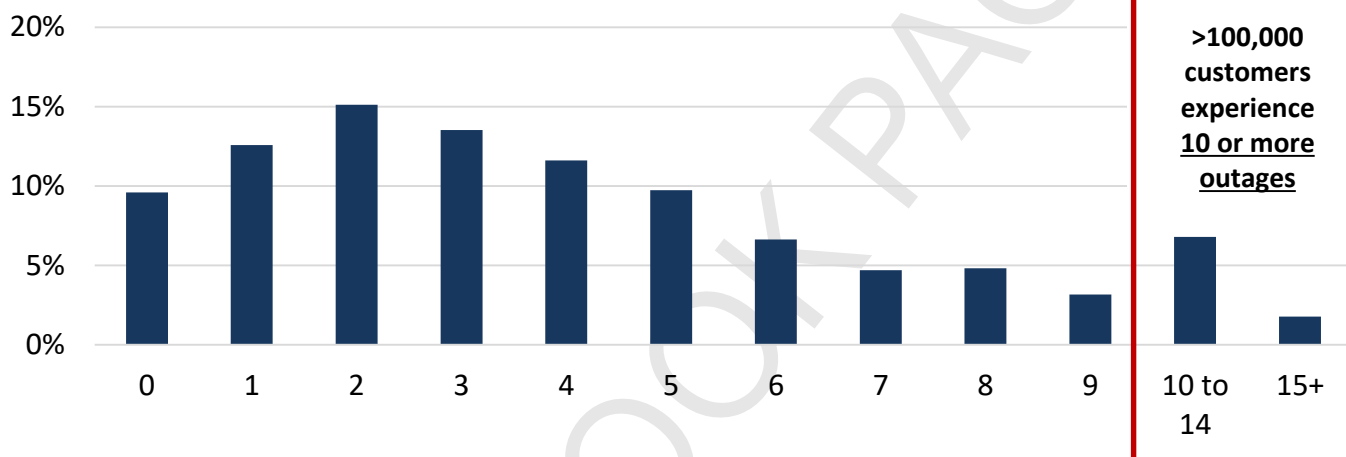


### Making Choices for Hydro One's Distribution System

Hydro One customers experience different levels of reliability, depending on where they live, equipment and the historical legacy of when the system was built.

While some Hydro One customers didn't experience any outages in 2017 or 2018, others were without power more than 15 times per year. Similarly, the total length of time that customers were without power ranged from less than one hour to more than 50 hours per year.

### Average Number of Outages Per Customer (2018)



There are investments Hydro One can make to bring customers experiencing poor reliability closer to the system average. This includes modernizing certain distribution lines by adding remote monitoring, switches to detect and isolate the cause of a power interruption, and batteries to minimize the impact on customers.

### There are two ways Hydro One can fund improvements for these customers:

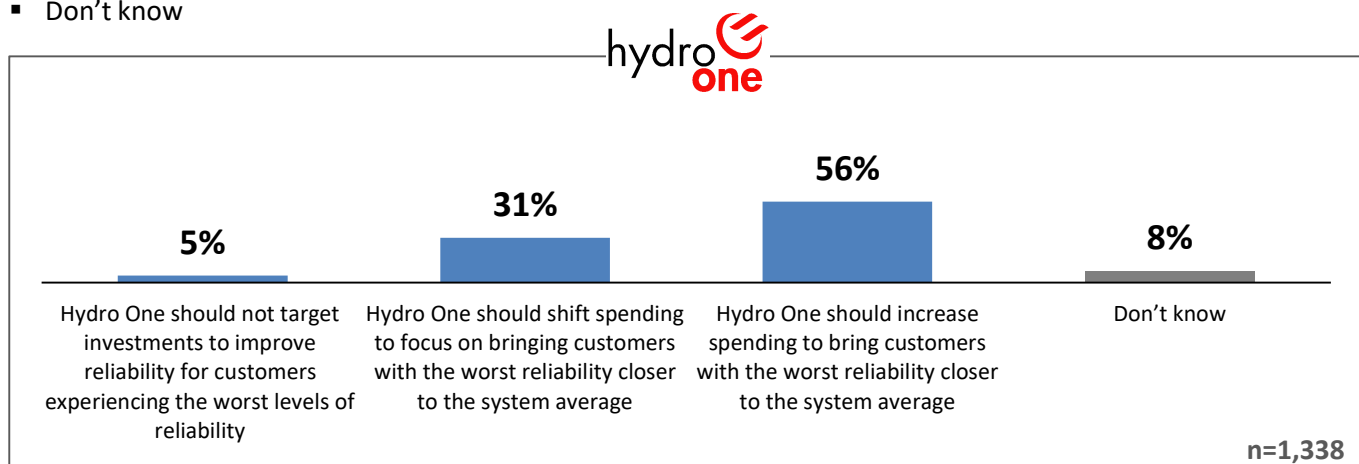
- Hydro One can shift spending away from circuits that experience average or better reliability to those with poor reliability. That will mean customers on circuits with average or better reliability will likely experience small declines in reliability, while customers with the worst reliability will see significant improvements.
- Hydro One can increase spending to provide additional resources for customers with the worst reliability and keep spending the same on circuit with average or better reliability. With this approach, no customer will be worse off, while customers with the worst reliability will see significant improvements.



## Helping Customers with Poor Reliability

Q Which of the following statements best represents your point of view?

- Hydro One should not target investments to improve reliability for customers experiencing the worst levels of reliability in order to keep costs down, even if that leaves some with worse reliability than others.
- Hydro One should shift spending to focus on bringing customers with the worst reliability closer to the system average without raising prices, even if that means that reliability may go down for customers whose reliability is currently average or above.
- Hydro One should increase spending to bring customers with the worst reliability closer to the system average, even if that increases my monthly bill by **less than 25 cents** each year.
- Don't know



	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Hydro One should <u>not</u> target investments to improve reliability for customers experiencing the worst levels of reliability	5%	4%	9%	4%	5%	6%	5%
Hydro One should shift spending to focus on bringing customers with the worst reliability closer to the system average	31%	31%	33%	30%	30%	32%	33%
Hydro One should increase spending to bring customers with the worst reliability closer to the system average	56%	56%	53%	56%	57%	55%	55%
Don't know	8%	9%	4%	10%	8%	7%	7%



Q Which of the following statements best represents your point of view?

<b>Additional Comments (n=95)</b>	<b>n-size</b>
93% of respondents did not provide additional feedback	
Reliability is critical and should be equal for all customers	18
Keep rates low - stop increasing	14
Hydro one should pay- make cuts from within	12
Issues with survey / need more information	11
Money should be spent for the biggest improvement for the most people	9
Consider alternate energy sources for customers	4
Money must be spent wisely	3
Some outages are to be expected	2
Other	16
None	2
Don't Know	1
Refused	3



### Making Choices for Hydro One's Distribution System

One of the issues that Hydro One planners face is whether to continue building out the distribution system in areas where economic development is expected to lead to future growth. Certain pockets across Ontario are experiencing regional growth and economic development, which leads to the need for greater investments in infrastructure to meet the demand for electricity.

Currently, in order to keep rates low, Hydro One **reactively increases the capacity of its system** to address community and economic growth. That means Hydro One only adds new capacity to its system when there are firm expectations of new demand and most of the costs to expand are borne by the connecting customers.

Some communities have expressed concern that, with this approach, it is difficult to attract new businesses to their community. For instance, not all communities currently have access to the level of power needed to grow and attract new businesses. While the level of power required to service a home is available across Hydro One's service territory, some businesses, including gas stations, grocery stores, and motels, require a greater electrical capacity to operate.

To help regional and economic development, Hydro One could take on a more **proactive role** and make the investments necessary to increase the capacity needed to supply communities where future growth is projected. If Hydro One responds to these communities and builds that capacity, all Hydro One customers will share the cost of adding this infrastructure, particularly if no businesses come. Communities say that attracting new business will increase demand and that will spread the costs out.

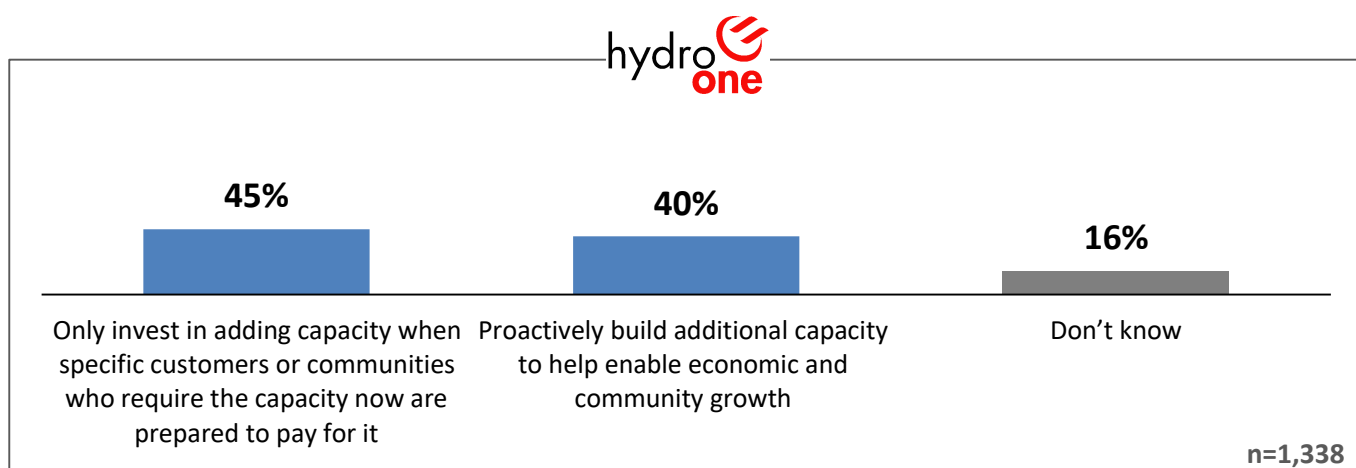
The question is whether customers would like Hydro One to promote or react to economic growth in the communities it operates in.





Q Which of the following statements best represents your point of view?

- Hydro One should only invest in adding capacity when specific customers or communities who require the capacity now are prepared to pay for it.
- Where a local community asks for it, Hydro One should proactively build additional capacity to help enable economic and community growth based on a forecast of the area's future requirements, even if these investments increase my monthly electricity bill by **about 50 cents** each year.
- Don't know



	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Only invest in adding capacity when specific customers or communities who require the capacity now are prepared to pay for it	45%	44%	50%	43%	45%	47%	41%
Proactively build additional capacity to help enable economic and community growth	40%	40%	37%	42%	38%	38%	43%
Don't know	16%	16%	14%	15%	17%	15%	16%



Q Which of the following statements best represents your point of view?

<b>Additional Comments (n=94)</b>	<b>n-size</b>
93% of respondents did not provide additional feedback	
Developers/communities requiring services should pay	19
Hydro one should pay- make cuts from within	13
Consider green/alternative technology	9
Good planning and working with communities	8
Keep rates down	7
Businesses requiring service should pay	4
Upgrade services/capacity	4
Critical of question/survey	3
Work with developers/cities/other professionals or organizations	1
Manufacturing - general	1
Other	19
None	1
Refused	4



## Keeping Hydro One's Business Running

### Making Choices for Hydro One's Distribution System

Hydro One is more than just poles and wires – it's a business that needs to invest in equipment such as tools, trucks, buildings, computers and software.

When deciding whether to continue to maintain existing equipment or replace them, Hydro One considers whether the risks and costs of continuing to use it outweigh the benefits of waiting longer to replace it. Delaying investments may make it harder for staff to do their jobs safely and maintain reliability and security standards.

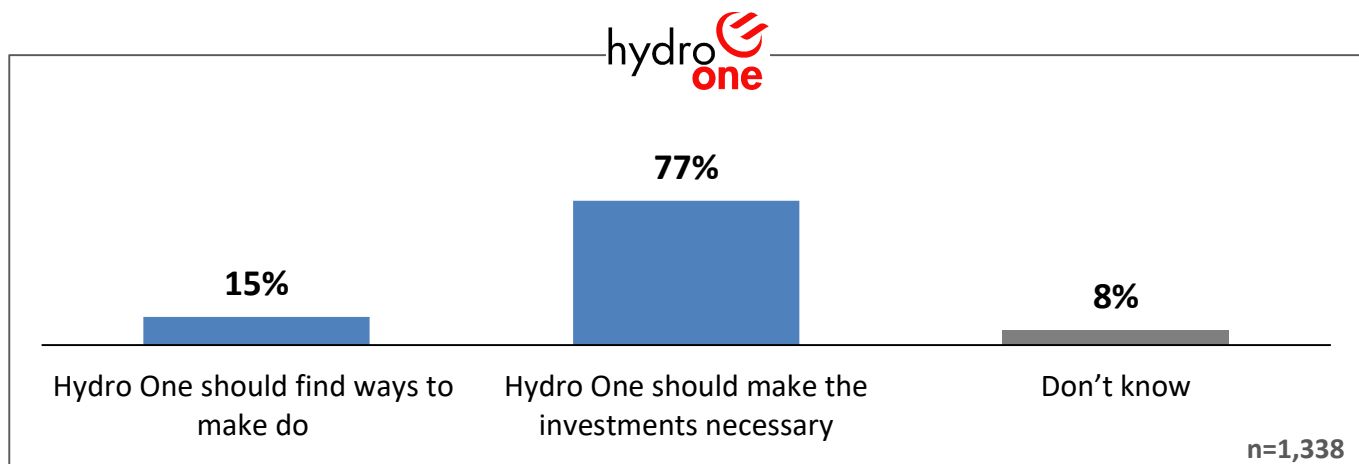




## Keeping Hydro One's Business Running

**Q** Which of the following statements best represents your point of view?

- Hydro One should find ways to make do with the facilities, equipment, vehicles and IT and computer systems it already has and only replace the equipment with the most urgent needs, even if that means increasing risk to safety, reliability, and security.
- Hydro One should make the investments necessary to ensure its staff will have access to equipment of the same standard as similar sized businesses.
- Don't know



	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Hydro One should find ways to make do	15%	15%	15%	16%	13%	13%	18%
Hydro One should make the investments necessary	77%	77%	76%	77%	75%	79%	75%
Don't know	8%	8%	9%	7%	12%	8%	7%



Q Which of the following statements best represents your point of view?

<b>Additional Comments (n=121)</b>	<b>n-size</b>
91% of respondents did not provide additional feedback	
Find efficiencies in operation cost, especially salaries	20
Invest prudently, only in most necessary equipment	20
Workers need safe, reliable equipment	19
Survey is leading, not giving enough options, biased	11
Keep tech and equipment up to date, prioritize service	10
Investment should come from profits, not increase to customer	8
Lower cost for consumer	5
Perform thorough maintenance to get more value	5
Invest in worker training, not just equipment and tech	4
More information is needed to answer	3
Compromise between options	1
Replace and upgrade before more expensive issues rise	1
Other	11
None	1
Refused	2

# Online Workbook

## Investing in New Technology

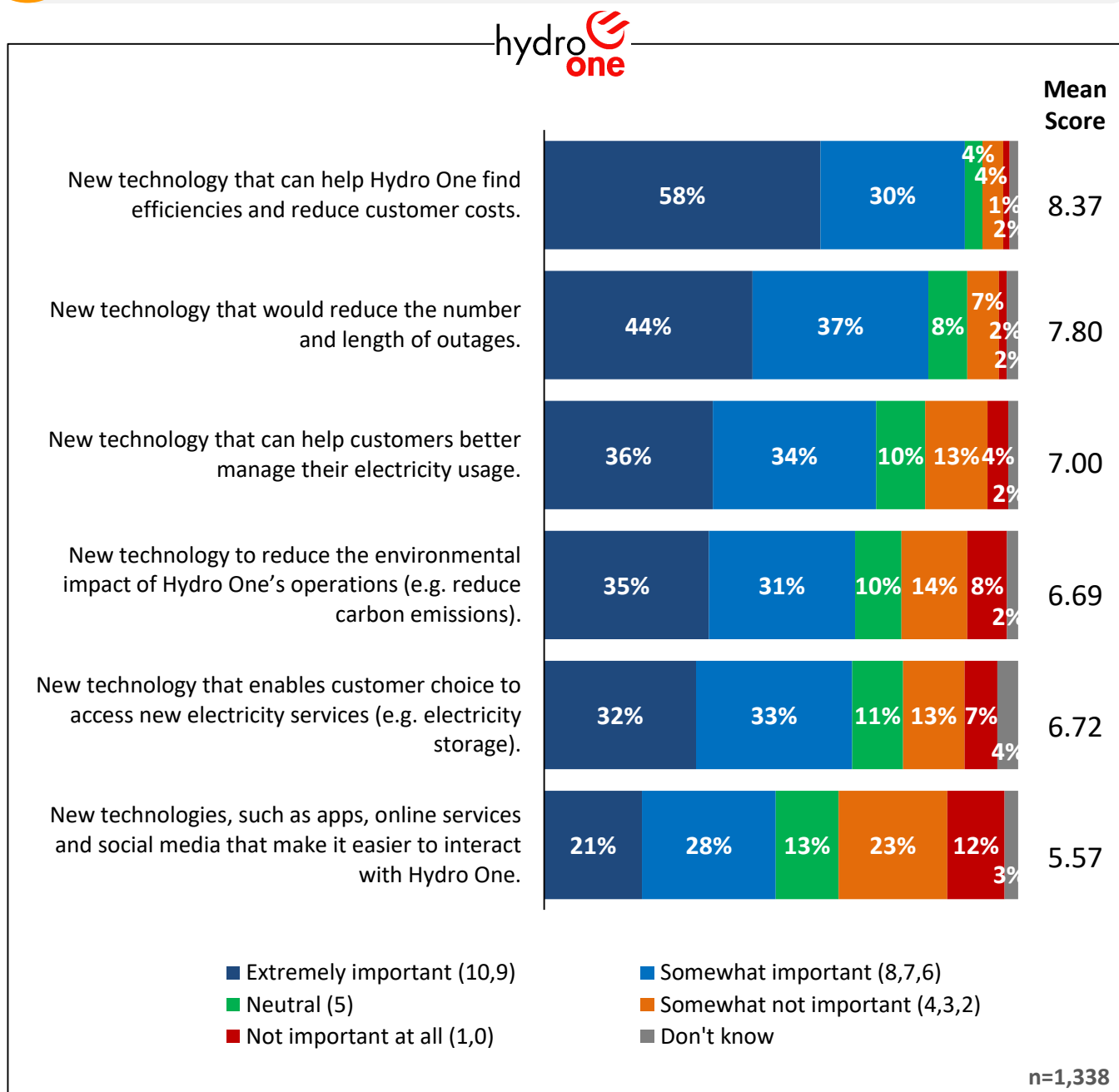
Residential



Another investment category is related to new technology that Hydro One could invest in to address a range of issues. These include reliability, efficiency, customer service, Hydro One's impact on the environment, new service offerings and tools to manage electricity usage.

Q

How important are each of the following investments in new technology that Hydro One could focus on?



# Online Workbook

## Investing in New Technology

Residential



Another investment category is related to new technology that Hydro One could invest in to address a range of issues. These include reliability, efficiency, customer service, Hydro One's impact on the environment, new service offerings and tools to manage electricity usage.

Q

How important are each of the following investments in new technology that Hydro One could focus on? BY **Mean Score**

	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
New technology that can help can help Hydro One find efficiencies and reduce customer costs.	8.37	8.38	8.28	8.37	8.36	8.28	8.59
New technology that would reduce the number and length of outages.	7.80	7.79	7.86	7.93	7.78	7.67	7.82
New technology that can help customers better manage their electricity usage.	7.00	7.06	6.41	6.99	6.90	6.99	7.22
New technology to reduce the environmental impact of Hydro One's operations (e.g. reduce carbon emissions).	6.69	6.70	6.55	6.65	6.97	6.45	6.71
New technology that enables customer choice to access new electricity services (e.g. electricity storage).	6.72	6.77	6.32	6.76	6.80	6.60	6.76
New technologies, such as apps, online services and social media that make it easier to interact with Hydro One.	5.57	5.62	5.10	5.64	5.55	5.50	5.60

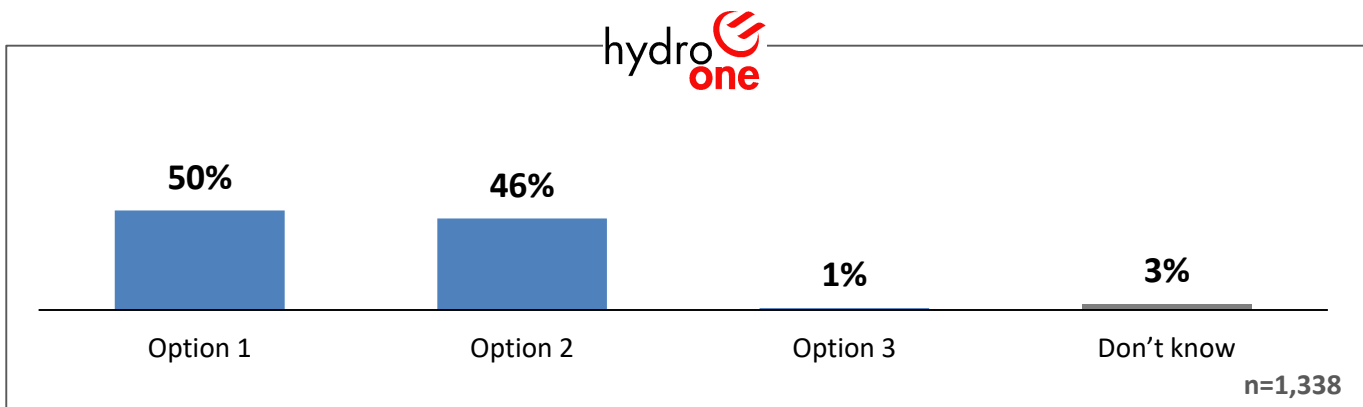




Q

Which of the following statements best represents your point of view when it comes to investing in new technologies?

- **Option 1:** Hydro One should only invest in new technologies if there is clear evidence that these technologies will lead to positive outcomes.
- **Option 2:** Hydro One should pursue Option 1 and also invest in pilot projects for new technologies where the company sees a good chance that it would lead to positive outcomes.
- **Option 3:** Hydro One should not invest in these new technologies.
- Don't know



	Total	Primary Residential	Seasonal Residential	Southern	Central	Eastern	Northern
Option 1	50%	49%	52%	52%	45%	51%	50%
Option 2	46%	46%	46%	45%	49%	46%	46%
Option 3	1%	1%	1%	0%	1%	1%	1%
Don't know	3%	3%	2%	3%	4%	3%	3%



Q

Which of the following statements best represents your point of view when it comes to investing in new technologies?

<b>Additional Comments (n=72)</b>	<b>n-size</b>
95% of respondents did not provide additional feedback	
Make investments that are proven to reduce customer bills	17
Only make investments that are proven to work and improve service	16
Growth and new technology is essential	9
Allow or incentivize customer local generation and conservation technology	5
Money for investment should come from profits, not increased bills	4
Invest more in green and alternative energy, environmental protection	3
Be transparent about how much is invested and where	3
Ensure employees are trained to keep up with technology	2
Other	10
None	1
Don't know/refused	3

# Small Business Customers **Online Workbook Results**





### Field Dates & Workbook Delivery

The **Small Business Online Workbook** was sent to a random subset of Hydro One Small Business (GS<50kW) customers who have provided the utility with an email address. Customers had an opportunity to complete the workbook between December 20<sup>th</sup>, 2019 and January 15<sup>th</sup>, 2020.

Each customer received a workbook customised to their rate zone and class using a unique URL that could be linked back to their annual consumption, region and rate class.

In total, the Small Business workbook was sent to **1,285** customers via e-blast from Hydro One.

### Small Business Online Workbook Completes

A total of **282** (unweighted) Hydro One Small Business customers completed the online workbook via a unique URL.

### Sample Weighting

The Small Business online workbook sample has been weighted proportionately by rate zone and consumption quartiles in order to be representative of the broader Hydro One service territory.

*The table below summarizes the weighted sample breakdown by rate zone and quartile. For unweighted n-sizes, please consult Page 16 of this report.*

Weighted Sample	Consumption Quartiles				Total
	Low	Medium-Low	Medium-High	High	
Southern	8.5%	8.3%	8.1%	8.6%	33.5%
Central	5.7%	5.8%	5.8%	5.7%	23.0%
Northern	6.7%	6.9%	6.6%	6.3%	26.5%
Eastern	4.2%	4.1%	4.5%	4.4%	17.1%
<b>Total</b>	<b>25.0%</b>	<b>25.0%</b>	<b>25.0%</b>	<b>25.0%</b>	<b>100.0%</b>

**Note:** Graphs and tables may not always total 100% due to Page 90 of 244 rounding numbers. Caution interpreting results with small n-sizes.



### Welcome to Hydro One's Customer Engagement!

**Hydro One needs your input on choices that will impact the services you receive and the rates that you pay.**

- **Hydro One** is developing its investment plan for 2023 to 2027. This plan will determine the investments Hydro One will make in equipment and infrastructure, the services it provides, and the rates you pay.
- As **Hydro One** plans for the future, they must ensure their business decisions are aligned with customer priorities, preferences, and needs.
- **Hydro One** will be accountable to the public regulator, the Ontario Energy Board (OEB), both in terms of sharing what customers say and demonstrating how they considered those views.
- **You don't need to be an electricity expert** to participate in this engagement. This workbook is focused on basic choices and provides the background information you need to answer the questions.
- This customer engagement will take approximately 20-30 minutes to complete, depending on the level of feedback you wish to provide. Your progress will be saved as you move through the workbook, meaning you can leave and return to the customer engagement at any time.

**All individual responses will be kept confidential.** Innovative Research Group (INNOVATIVE), an independent research company, has been hired to gather your feedback.

**Those who complete the questions that follow will be invited to enter a draw to win one of ten (10) \$100 cash prizes.**

If you are reading this on a smaller mobile device, you may want to consider accessing the survey from a tablet, desktop or laptop instead so that it is easier for you to read.

## Hydro One's Role in Ontario's Electricity System

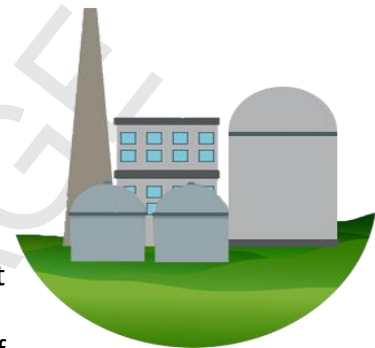
Ontario's electricity system is owned and operated by public, private, and municipal corporations across the province. It is made up of three key components: **generation**, **transmission** and **distribution**. Hydro One is involved in both electricity transmission across Ontario and distribution in many communities.

### Generation

#### Where electricity comes from.

Ontario gets its electricity from a mix of energy sources. About half comes from nuclear power. The remainder comes from a mix of hydroelectric and natural gas, and to a lesser extent, wind and solar.

Ontario Power Generation, a government-owned company, generates almost half of Ontario's electricity. The other half comes from multiple generators who have contracts with the grid operator to provide power from a variety of sources.

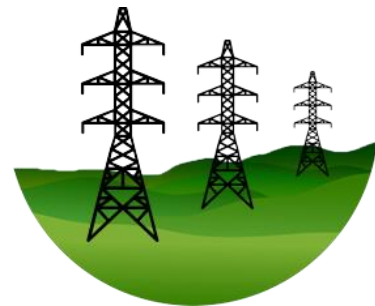


### Transmission

#### Electricity travels across Ontario.

Once electricity is generated, it must be transported to urban and rural areas across the province. This happens by way of high voltage transmission lines that serve as highways for electricity. Often these lines are suspended on large, steel lattice towers. The province has more than 30,000 km of transmission lines, and almost all are owned by Hydro One.

Hydro One provides transmission services to most electricity customers in Ontario.

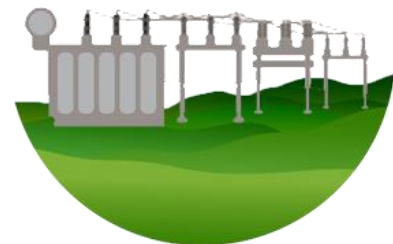


### Local Distribution

#### Delivering power to homes and businesses in your community.

In many communities, Hydro One is also responsible for the last step of the journey: delivering electricity to customers through its distribution system. This local distribution system includes transformer stations that decrease the voltage of the electricity so it can be used safely in your home or business.

While there are many distributors across Ontario, Hydro One builds, operates and maintains this distribution system that serves you. Hydro One reads meters, calculates and collects bills for all parts of the electricity system and answers customer calls.

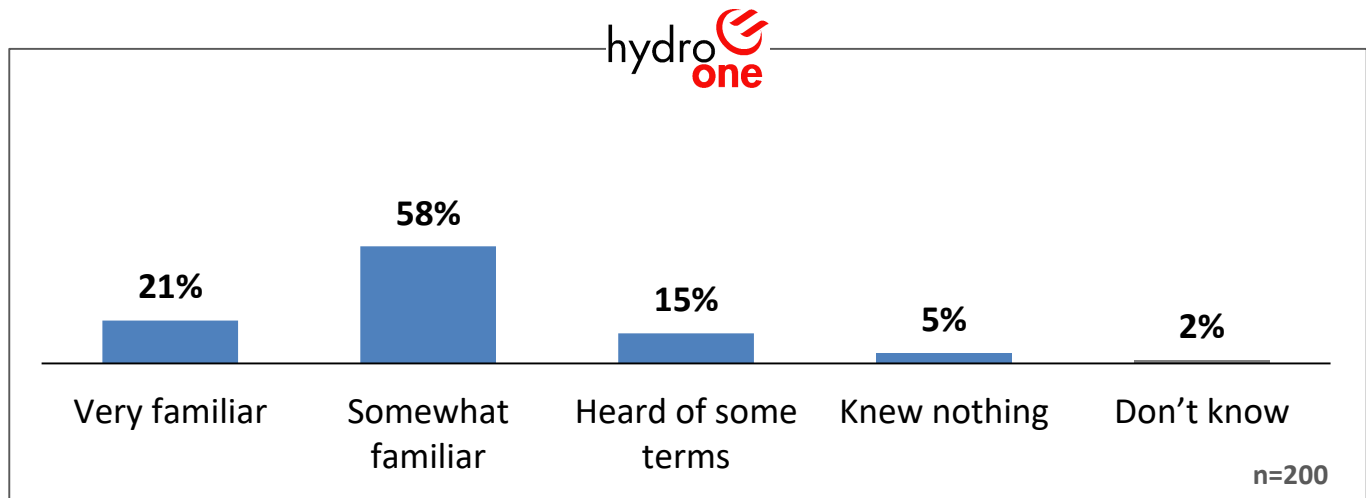




## Electricity 101

Q

Before this survey, how familiar were you with the various parts of the electricity system and how they work together?



	Total	Southern	Central	Eastern	Northern
Very familiar and could explain the details	21%	23%	21%	18%	22%
Somewhat familiar with the system but could not explain all the details	58%	51%	58%	61%	65%
Had heard of some of the terms and organizations mentioned	15%	20%	14%	13%	10%
I knew nothing about how the provincial electricity system works	5%	6%	5%	6%	3%
Don't know	2%	-	3%	2%	2%



## Who is Hydro One?

### Electricity 101

- Hydro One is Ontario's largest electricity transmission and distribution service provider.
- Hydro One is a publicly traded corporation. Its largest shareholder is the Government of Ontario.
- Hydro One is regulated by the Ontario Energy Board (OEB) and must apply to the OEB for approval of the amount it charges for its services.

### Hydro One's Transmission System

- Hydro One's transmission system takes electricity from generators (i.e. the Adam Beck facility at Niagara Falls or the Bruce Power nuclear power plant) and transports it via high-voltage transmission lines to local communities, where the voltage is lowered ("stepped-down") so you can use it in your home or business.
- Hydro One's transmission system serves 98% of electricity customers in Ontario.

### Hydro One's Distribution System

- Hydro One is also required by law to distribute electricity across Ontario to any customer not otherwise served by a local distribution company. This means that Hydro One's nearly 1.4 million customers are predominantly rural customers.
- Hydro One's local distribution system, which brings electricity to your home through a network of wires, poles and other equipment, covers approximately 75% of the geographic area of Ontario.
- Compared to other electricity distributors in the province, Hydro One's service territory is much larger and includes more rural and remote areas.



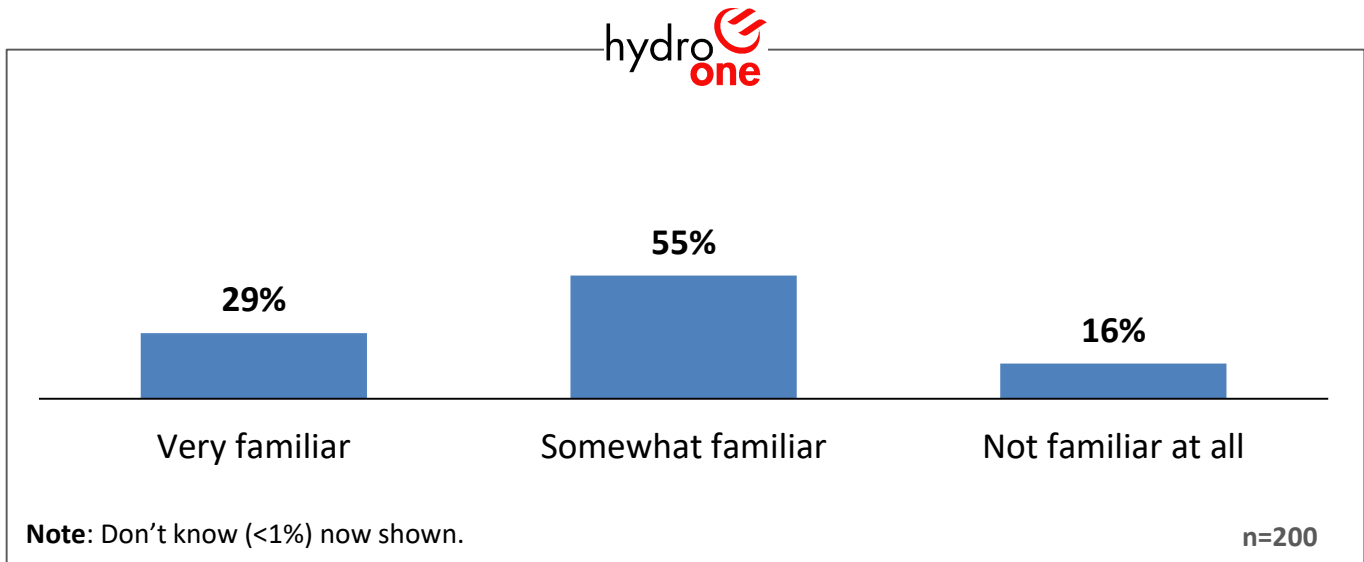




## Who is Hydro One?

Q

How familiar are you with Hydro One, which operates the transmission system across the province and the electricity distribution system in your community?



	Total	Southern	Central	Eastern	Northern
Very familiar	29%	28%	28%	30%	32%
Somewhat familiar	55%	51%	60%	56%	53%
Not familiar at all	16%	19%	13%	14%	15%
Don't know	0%	1%	-	-	-

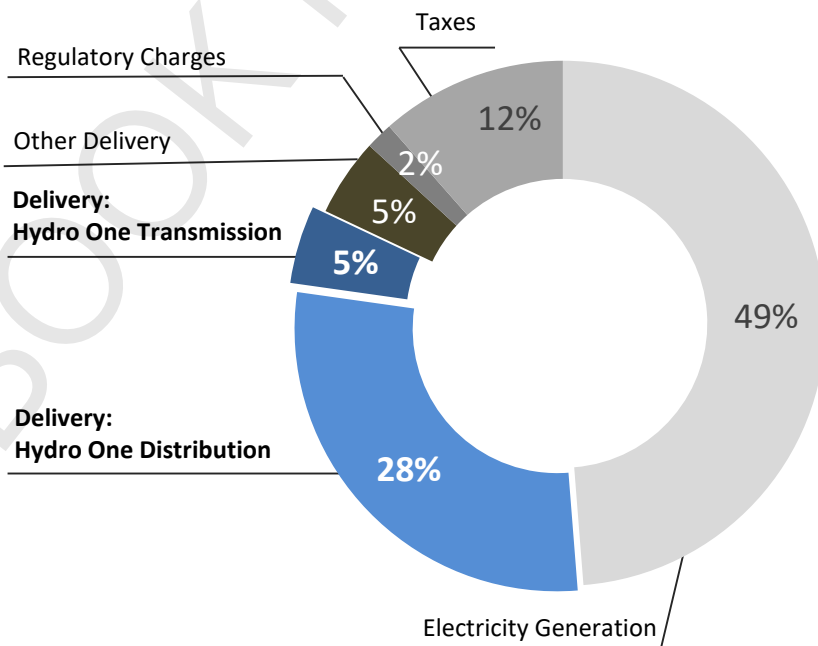


## How much of my bill goes to Hydro One?

### Electricity 101

- Every item and charge on your bill is mandated by the provincial government or regulated by the Ontario Energy Board (OEB), the provincial energy regulator.
- While Hydro One is responsible for collecting payment for the entire electricity bill, it only keeps about 33% or \$174.78 of the average small business customer's total electricity charges and HST (before the Ontario Electricity Rebate).
- This amount is split into 28% (\$149.57) for distribution, and 5% for transmission (\$25.21).
- The rest of the bill goes to power generation companies, taxes, and regulatory agencies.

**Breakdown of Monthly Bill**  
(before the Ontario Electricity Rebate)



### Hydro One Sample Monthly Bill\*

(Based on monthly usage of 2000 kWh)

Account Number:  
000 000 000 000 0000

Meter Number:  
00000000

#### Your Electricity Charges

#### Electricity

Off-Peak @ 10.1 ¢/kWh	129.28
Mid-Peak @ 14.4 ¢/kWh	51.84
On-Peak @ 20.8 ¢/kWh	74.88

**Delivery** **199.92**

Regulatory Charges 8.80

**Total Electricity Charges \$464.72**

HST 60.41

Ontario Electricity Rebate\* (-147.78)

**Total Amount \$377.35**

**Hydro One's  
portion of  
Delivery is  
\$174.78**

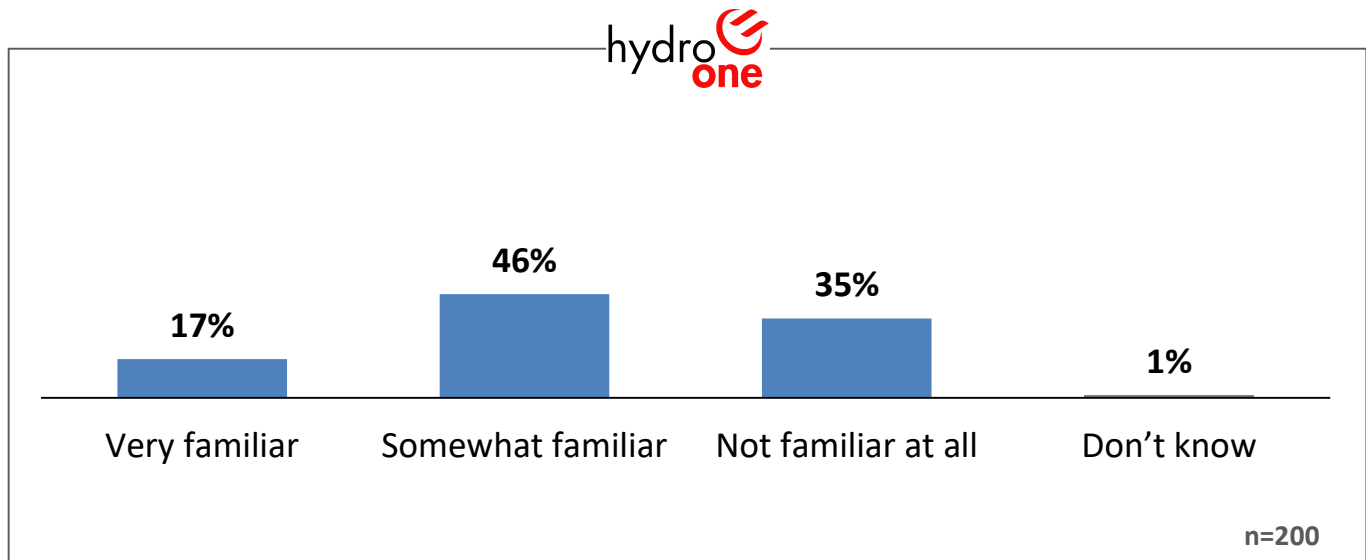
\*Since November 1, 2019, the Ontario Electricity Rebate (OER) is applied to bills for most residential consumers, farms and small businesses. The OER is a provincial rebate equal to 31.8% of the base invoice amount.



## How much of my bill goes to Hydro One?

Q

Before this survey, how familiar were you with the amount of your electricity bill that went to Hydro One?



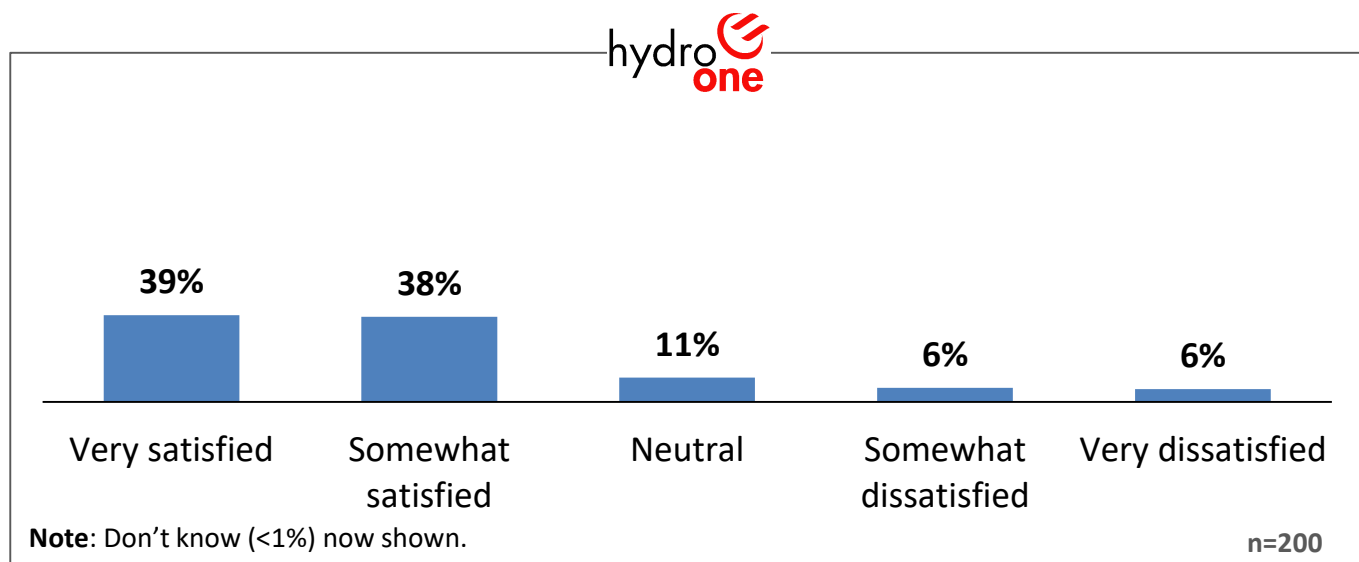
	Total	Southern	Central	Eastern	Northern
Very familiar	17%	15%	17%	19%	18%
Somewhat familiar	46%	43%	57%	40%	47%
Not familiar at all	35%	40%	24%	41%	33%
Don't know	1%	1%	2%	-	3%



## Satisfaction with Hydro One's Services

Q

Thinking specifically about the services provided to you and your community by Hydro One, overall, how satisfied or dissatisfied are you with the services that you receive?



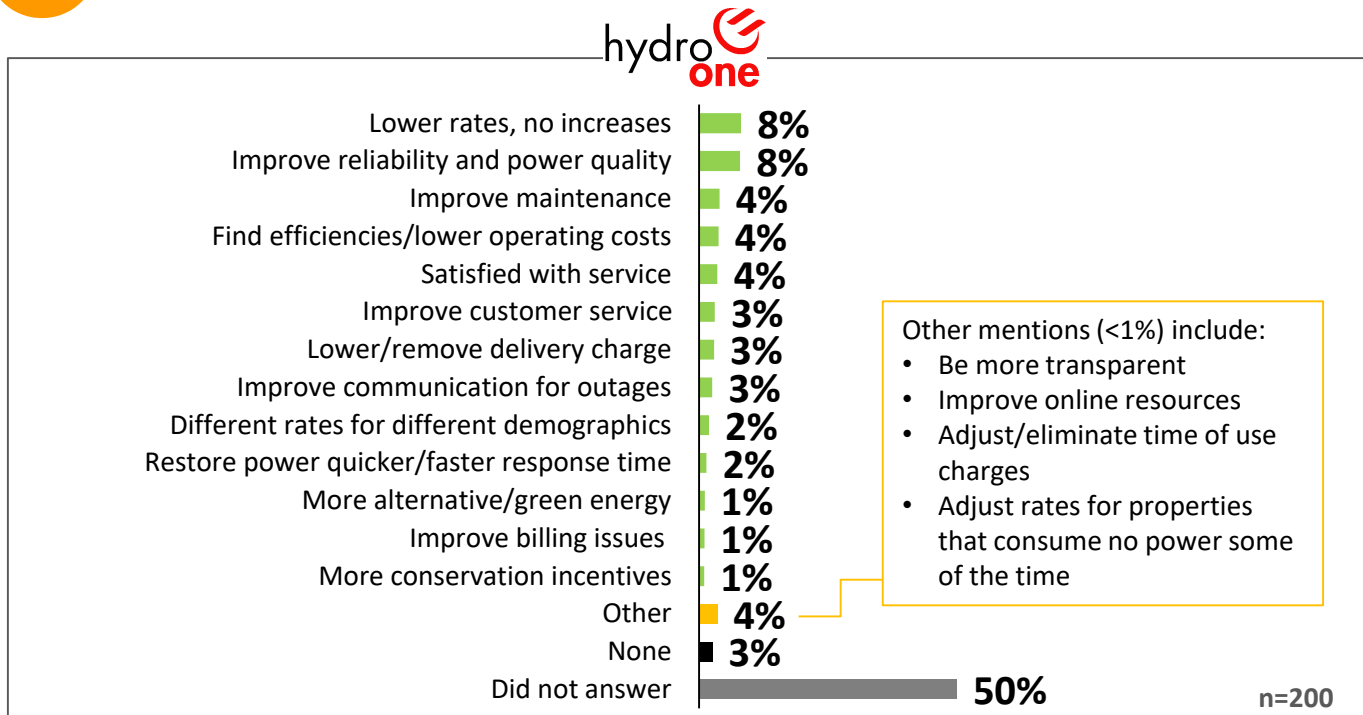
	Total	Southern	Central	Eastern	Northern
Very satisfied	39%	38%	30%	45%	42%
Somewhat satisfied	38%	42%	46%	34%	26%
Neutral	11%	11%	10%	6%	19%
Somewhat dissatisfied	6%	6%	7%	6%	6%
Very dissatisfied	6%	1%	7%	10%	7%
Don't know	0%	1%	-	-	-
<b>Overall satisfied</b>	<b>77%</b>	<b>80%</b>	<b>76%</b>	<b>78%</b>	<b>68%</b>
<b>Overall dissatisfied</b>	<b>12%</b>	<b>7%</b>	<b>14%</b>	<b>16%</b>	<b>13%</b>



## Satisfaction with Hydro One's Services

Q

Is there anything in particular you would like Hydro One to do to improve its services to you?

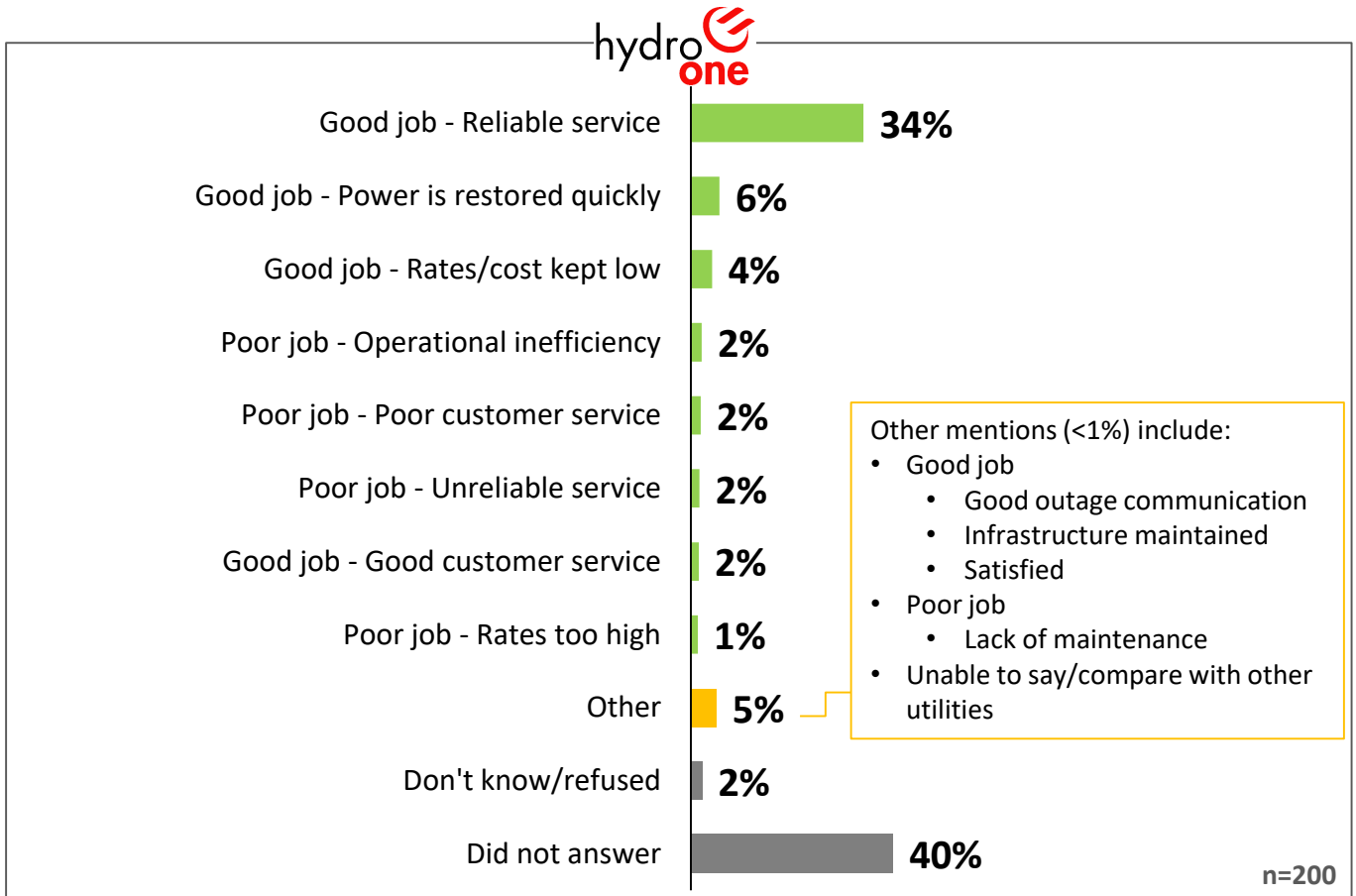


Needs	% agree the cost of my electricity bill has a major impact	% agree consumers are well served by the electricity system
Lower rates, no increases	10%	8%
Improve reliability and power quality	8%	7%
Improve maintenance	5%	5%
Find efficiencies/lower operating costs	4%	4%
Satisfied with service	4%	4%
Improve customer service	4%	4%
Lower/remove delivery charge	3%	3%
Improve communication for outages	3%	2%
Different rates for different demographics	3%	1%
Restore power quicker/faster response time	2%	1%
More alternative/green energy	1%	1%
Improve billing issues	1%	1%
More conservation incentives	1%	1%



## Satisfaction with Hydro One's Services

Q How do you know if Hydro One is doing a good job for you, or not?

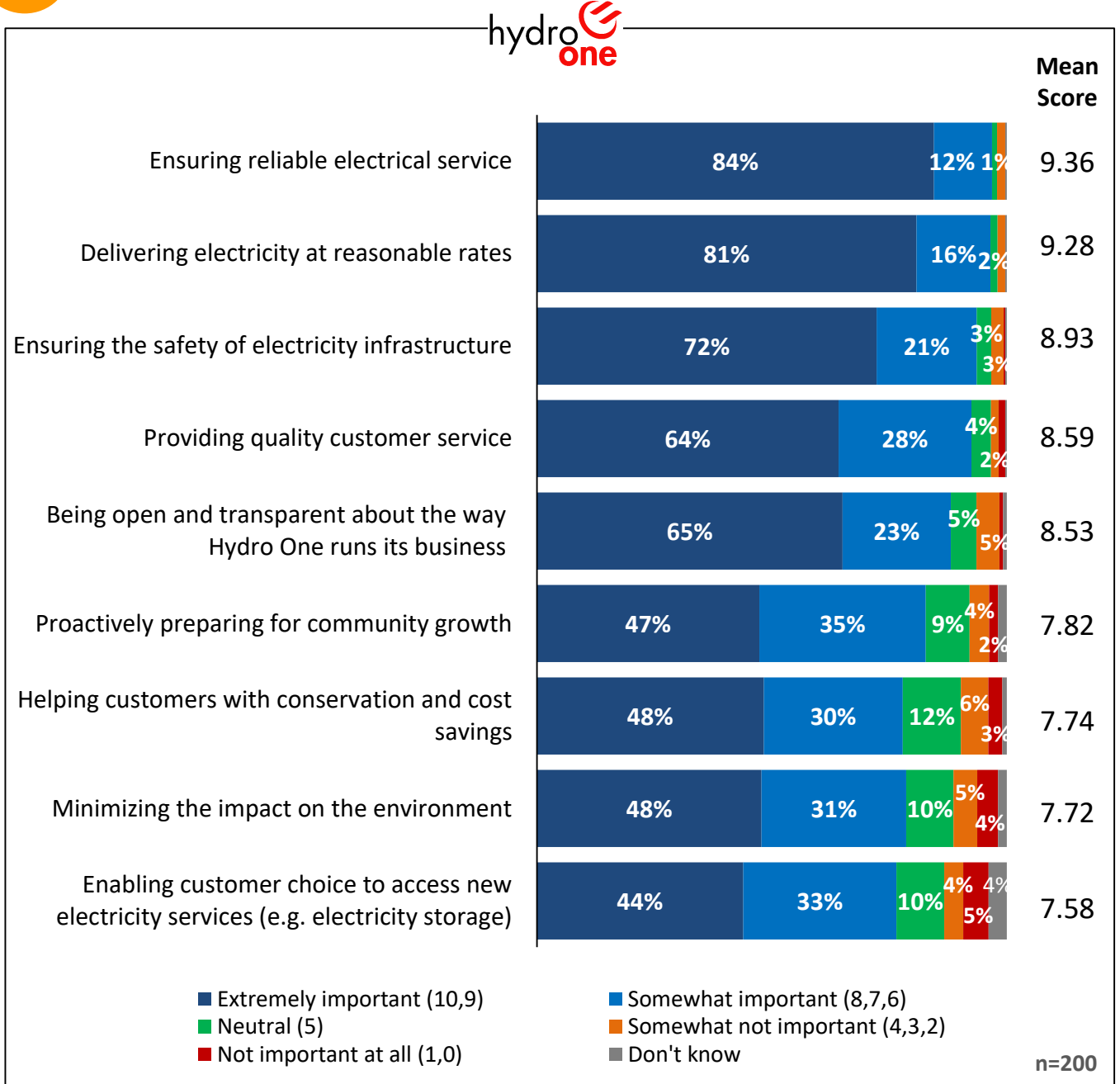




## Outcome Priorities

Through previous customer research and contacts, a number of outcomes were identified by customers as priorities for Hydro One. We would like to check that list with you to ensure it is complete. We also want to understand the priorities you give to different outcomes.

**Q** How important are each of the following Hydro One priorities to you as a customer?



# Online Workbook

## Outcome Priorities

Small Business



Through previous customer research and contacts, a number of outcomes were identified by customers as priorities for Hydro One. We would like to check that list with you to ensure it is complete. We also want to understand the priorities you give to different outcomes.

Q

How important are each of the following Hydro One priorities to you as a customer?  
BY Mean Score

	Total	Southern	Central	Eastern	Northern
Ensuring reliable electrical service	9.36	9.24	9.44	9.63	9.08
Delivering electricity at reasonable rates	9.28	9.16	9.20	9.54	9.23
Ensuring the safety of electricity infrastructure	8.93	9.06	8.63	9.01	8.99
Providing quality customer service	8.59	8.62	8.35	8.82	8.49
Being open and transparent about the way Hydro One runs its business	8.53	8.52	7.86	9.04	8.65
Proactively preparing for community growth	7.82	7.96	7.17	8.11	7.98
Helping customers with conservation and cost savings	7.74	7.89	7.45	7.79	7.73
Minimizing the impact on the environment	7.72	7.48	7.57	8.06	7.89
Enabling customer choice to access new electricity services (e.g. electricity storage)	7.58	7.52	7.12	7.88	7.85



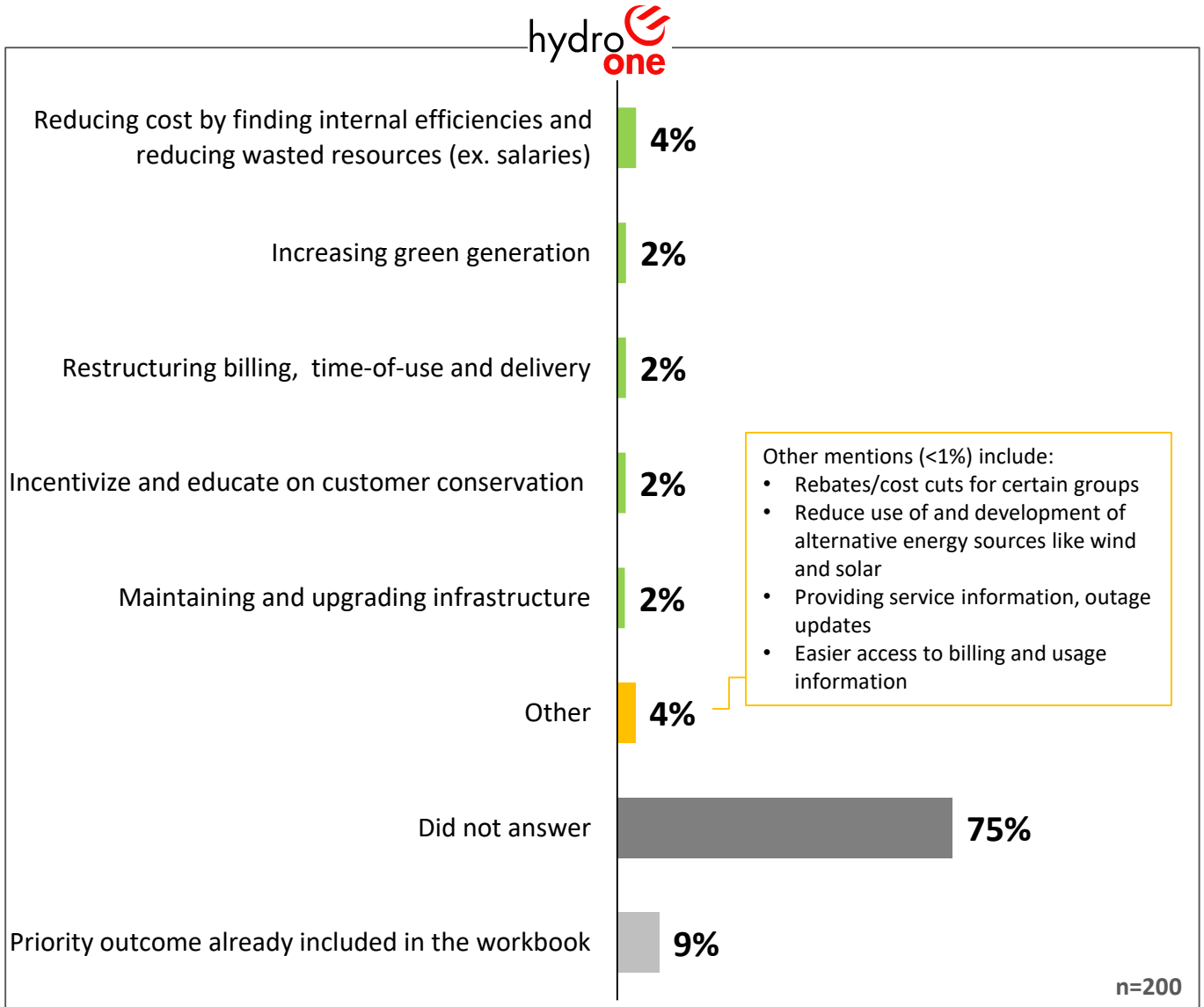


## Outcome Priorities

Through previous customer research and contacts, a number of outcomes were identified by customers as priorities for Hydro One. We would like to check that list with you to ensure it is complete. We also want to understand the priorities you give to different outcomes.



The list above may not include all the outcomes that matter to you. Are there any other important priorities that Hydro One should be focusing on that weren't included in the list above?

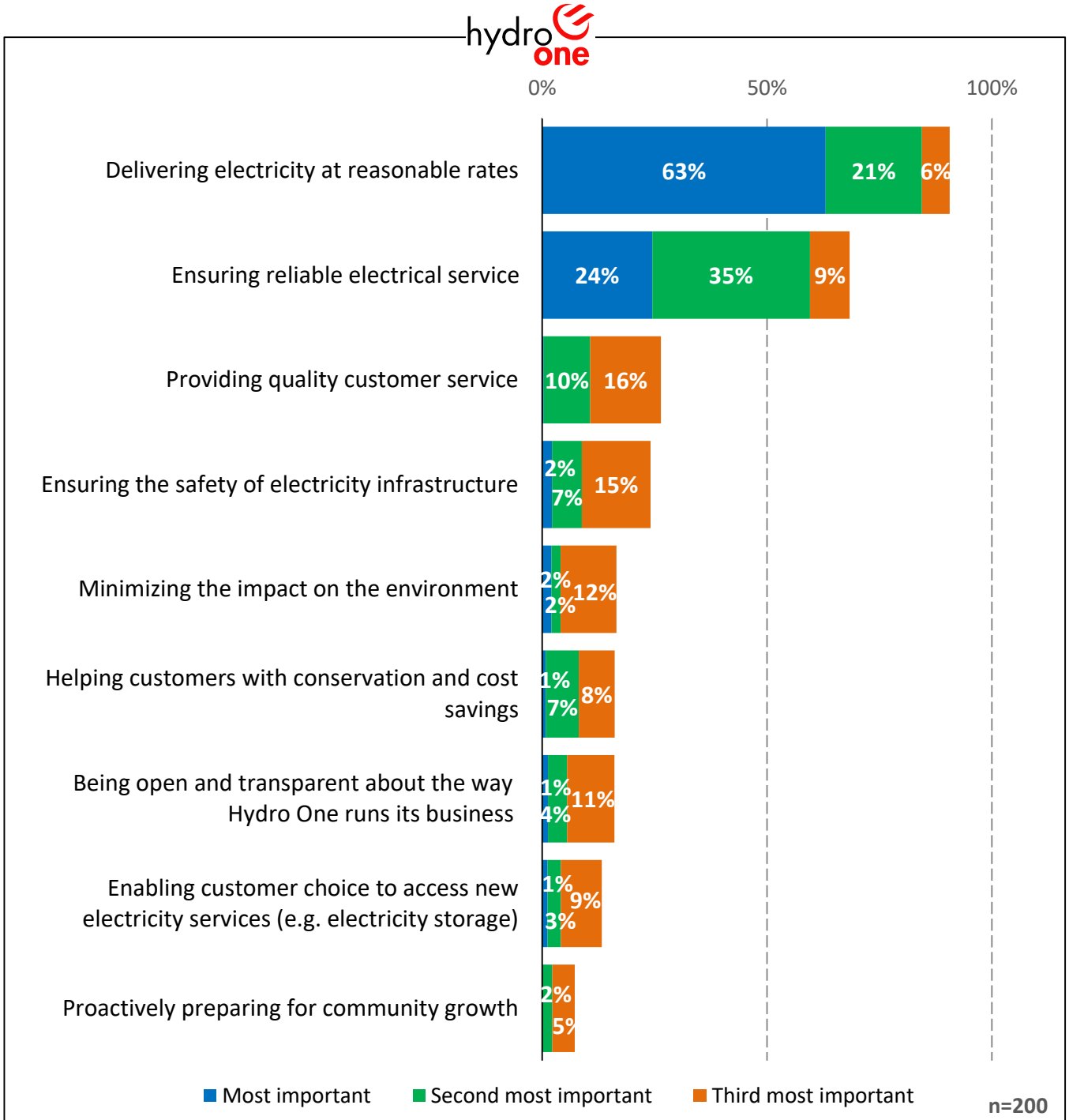




## Outcome Priorities

Q

Thinking again about the things Hydro One should be focusing on, please rank your top 3 priorities—where “1” would be the most important, “2” the second most important, and “3” the third most important.





## Reliability Experience and Priorities

Q

Now, let's talk about the reliability of electricity service you receive. Have you experienced any power outages at home in the past 12 months, which lasted longer than one minute? If so, approximately how many of these power outages did you experience?

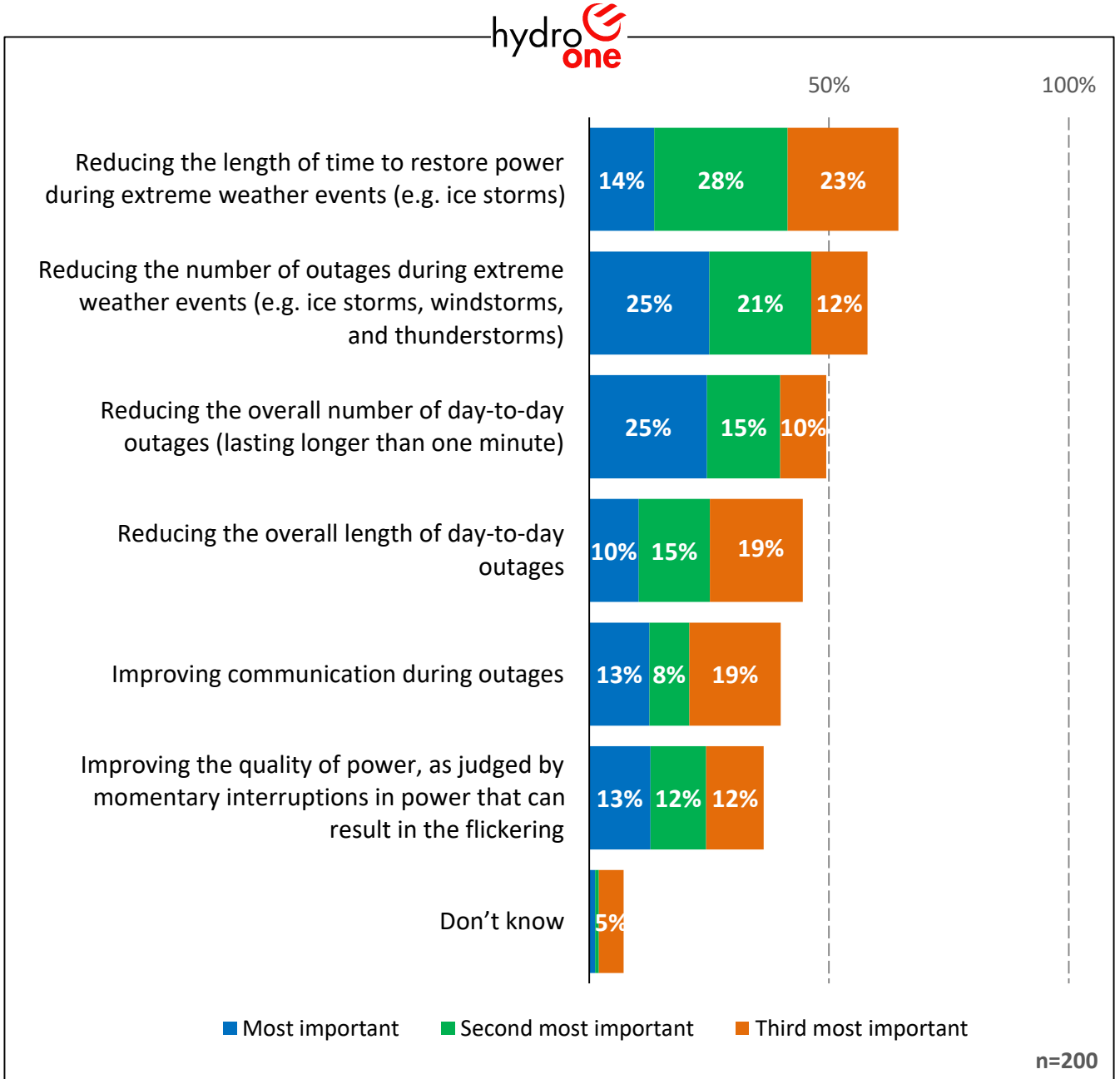
	Total	Southern	Central	Eastern	Northern
No outages	12%	12%	17%	7%	12%
1 outage	7%	9%	5%	6%	10%
2 outages	15%	20%	9%	22%	3%
3 outages	17%	16%	21%	19%	10%
4 outages	9%	11%	9%	3%	15%
5 outages	8%	4%	9%	14%	7%
6 outages	6%	4%	8%	4%	12%
7 outages	1%	-	-	1%	5%
8 or more outages	11%	13%	6%	12%	10%
Don't know	14%	12%	16%	12%	16%



## Reliability Experience and Priorities

When it comes to reliability, there are a number of areas that Hydro One could focus on. For example, Hydro One could focus on improving day-to-day reliability and/or reducing interruptions during storms and other extreme weather.

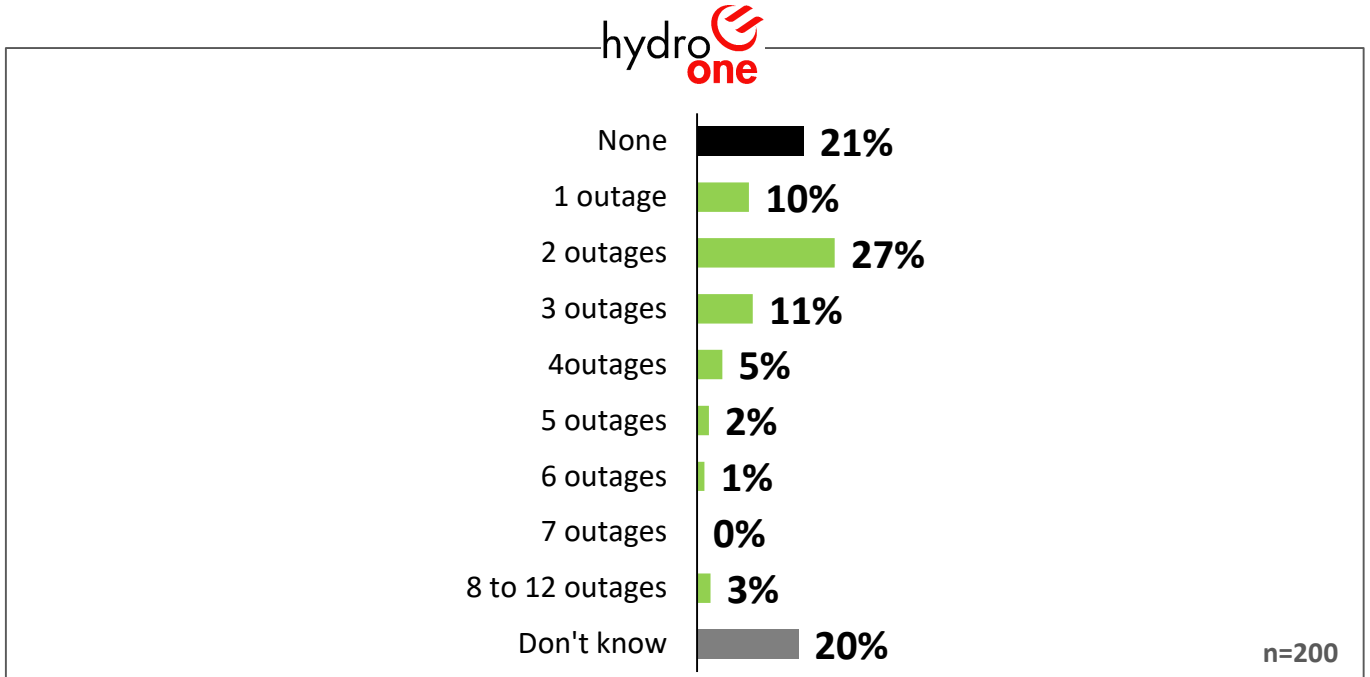
**Q** Among the following reliability outcomes, please rank your top 3 priorities—where “1” would be the most important, “2” the second most important, and “3” the third most important.





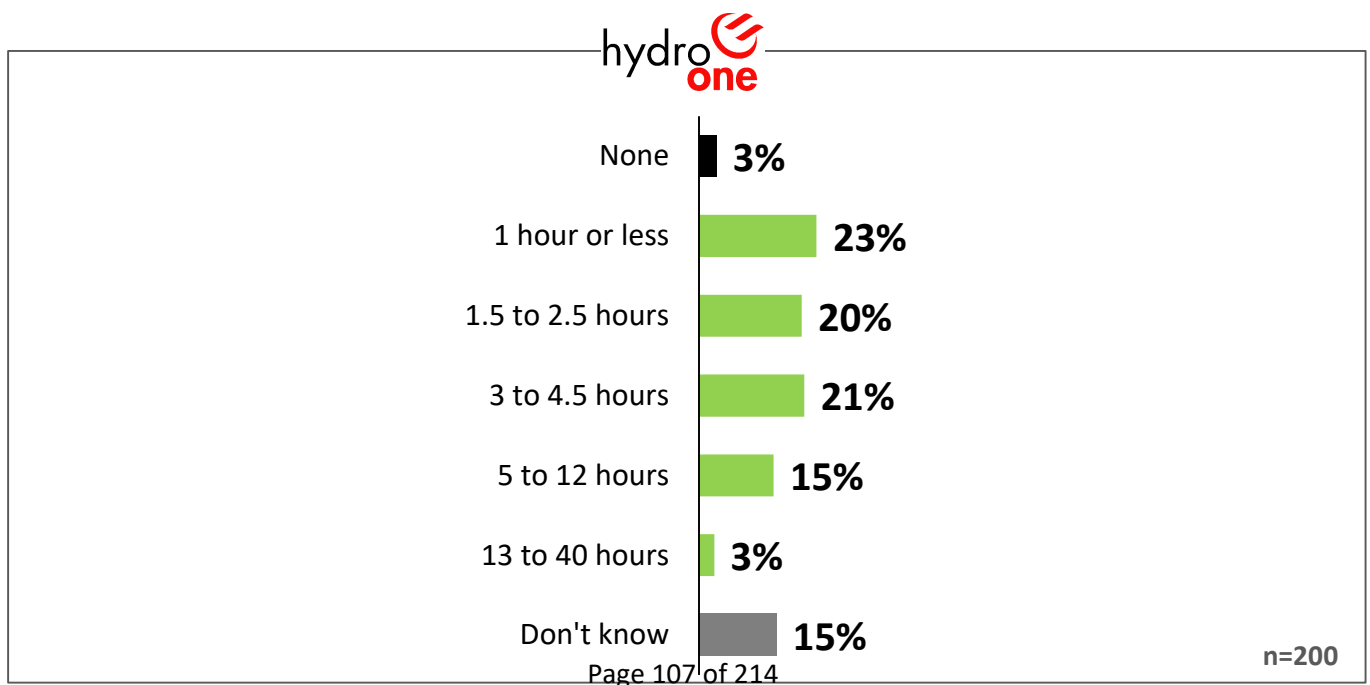
Q

What would you say is a reasonable number of outages that Hydro One customers should expect to experience every year?



Q

What would you say is a reasonable total length of outages that Hydro One customers should expect to experience every year?





## Comparing Hydro One's Spending to Others

### Hydro One's Investment Plan

On a yearly basis, Hydro One's spending for the distribution side of the business is benchmarked by the OEB against other electricity distributors in Ontario.

Servicing more sparsely populated areas means that, compared to urban areas, more equipment (e.g. wooden poles, transformers and wires) is needed to serve the same number of customers.

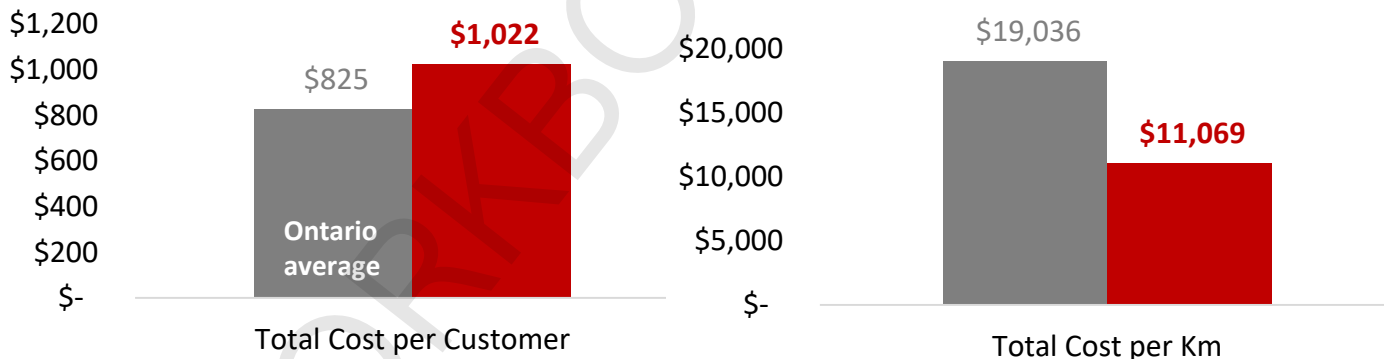
**On average, across Ontario 23 customers are served per kilometer of distribution line; in Hydro One's territory it is only 11 customers per kilometer.**

When we compare Hydro One to other electricity distributors, how well Hydro One compares depends on whether we look at cost per customer or cost per line km.

On a total cost per customer basis, it costs nearly \$200 more per customer for Hydro One to operate than the Ontario average. But when looking at the total cost per kilometer of distribution line, Hydro One's costs are \$8,000 below the Ontario average.

### Comparing Hydro One to Other Electricity Distributors (2018)

Source: 2018 OEB Benchmarking Report





## Comparing Hydro One's Spending to Others

**Benchmarking isn't the only way that Hydro One measures its operational efficiency.**

Like most businesses, Hydro One manages its spending in two budgets – a **capital budget** and an **operating budget**.

Its **capital budget** covers items that, once purchased, have lasting benefits over many years. This includes much of the equipment that is part of the distribution and transmission systems, such as poles, wires, cables, transformers, computers and information systems, vehicles and facilities.

**This phase of the engagement is focused on collecting your views on competing trade-offs in capital investments. These will be presented on the following pages.**

Hydro One's **operating budget** covers recurring expenses, such as the maintenance of equipment and the cost of customer service and billing.

In Hydro One's last rate application, the OEB limited the rate of Hydro One's annual operating cost increases by an amount that is less than inflation to incent the company to find ways of achieving the same outcomes for less money. Since 2015, Hydro One's operating costs have fallen by 4%.

The OEB runs an open and transparent review process where experts from the Ontario Energy Board (OEB) and intervenor groups review and challenge every dollar that Hydro One proposes to spend. Detailed discussion of Hydro One's operating budget is left to experts from the OEB and intervenors in the formal rate application review.

**Detailed questions about Hydro One's operating expenses will not be asked in this phase of the customer engagement.**

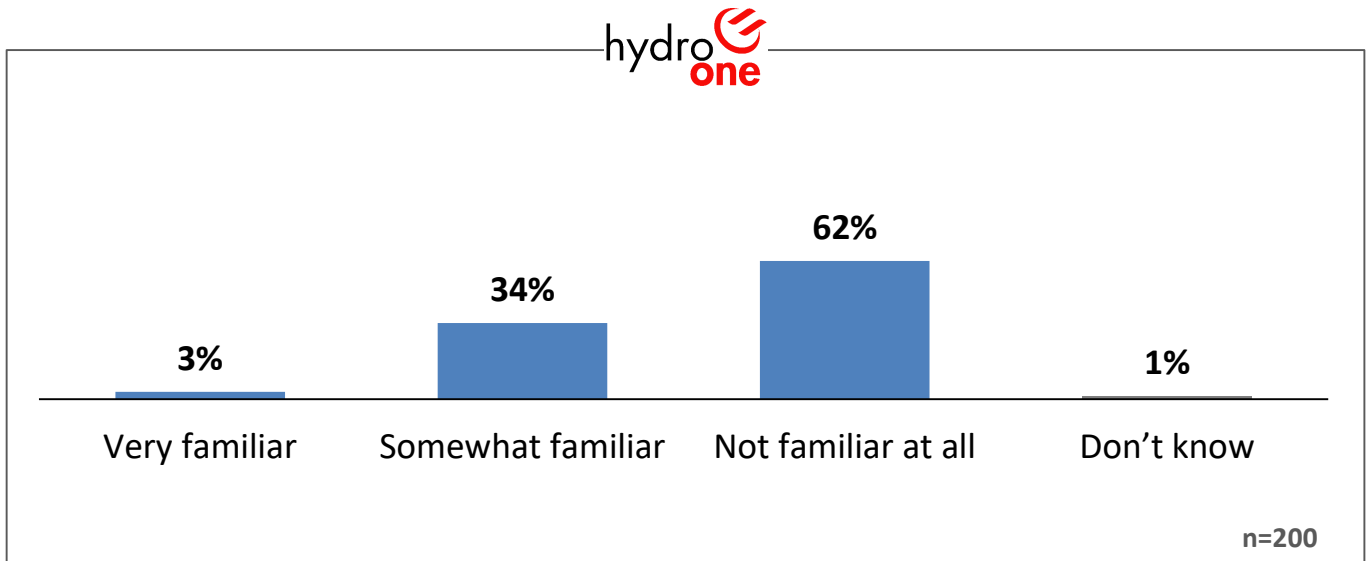
If you are interested in commenting on Hydro One's operating expenses, you are encouraged to participate in the OEB process when Hydro One files this application in 2021. Details will be available at that time at [oeb.ca/participate](http://oeb.ca/participate).



## Comparing Hydro One's Spending to Others

Q

Before this survey, how familiar were you with the OEB review process and the requirement for Hydro One to find operating savings every year??



	Total	Southern	Central	Eastern	Northern
Very familiar	3%	3%	2%	7%	-
Somewhat familiar	34%	28%	33%	33%	48%
Not familiar at all	62%	68%	63%	59%	52%
Don't know	1%	2%	2%	1%	-





## Comparing Hydro One's Spending to Others

Q

Before this survey, how familiar were you with the OEB review process and the requirement for Hydro One to find operating savings every year?

### Additional Comments (n=21)

90% of respondents did not provide additional feedback

n-size

Inefficiencies in operation, especially salaries

7

Prices are too high, not decreasing

3

Maintain and improve infrastructure before it becomes more expensive

2

Make operation costs and comparisons with other providers available

2

Increase budget from profits, not by raising customers bills

2

Hydro One's varied demographic needs to be accounted for regarding service and billing

2

OEB is not strong enough when enforcing requirements

1

Need more info / didn't understand survey / critical of survey

1

None

1



## Keeping Pace with Aging Distribution Infrastructure

Making Choices for Hydro One's Distribution System

**First, we would like to speak to you about Hydro One's distribution system.**

Most of Hydro One's distribution infrastructure (e.g. equipment like wooden poles, power transformers, and submarine cables) is now roughly 60 to 70 years old. Eventually, aging equipment deteriorates and has to be replaced to mitigate reliability, safety and environmental risks.



Hydro One has some control over when to make those investments.

Hydro One's **current approach** is to replace only the most critical aging equipment before it stops working. While Hydro One replaces aging equipment before it poses a safety, environmental or reliability risk, this still leaves 24% of station transformers and about 5% wooden poles currently in poor condition. Under Hydro One's current approach, the number of poles and station transformers in poor condition gets larger each year.

Hydro One's planners have identified **four options** for replacing aging equipment: Hydro One can continue its current level of investment, it can invest less, it can invest more to keep the percentage of aging equipment constant, or it can invest more to improve the percentage of aging equipment.

**Investing less** now would keep rate increases lower in the short term, but would lead to steeper rate increases in the future, as more equipment would need to be replaced later.

**Investing more** now, would mean higher rate increases now, but lower rate increases in the future, as Hydro One would replace more of its aging infrastructure now.

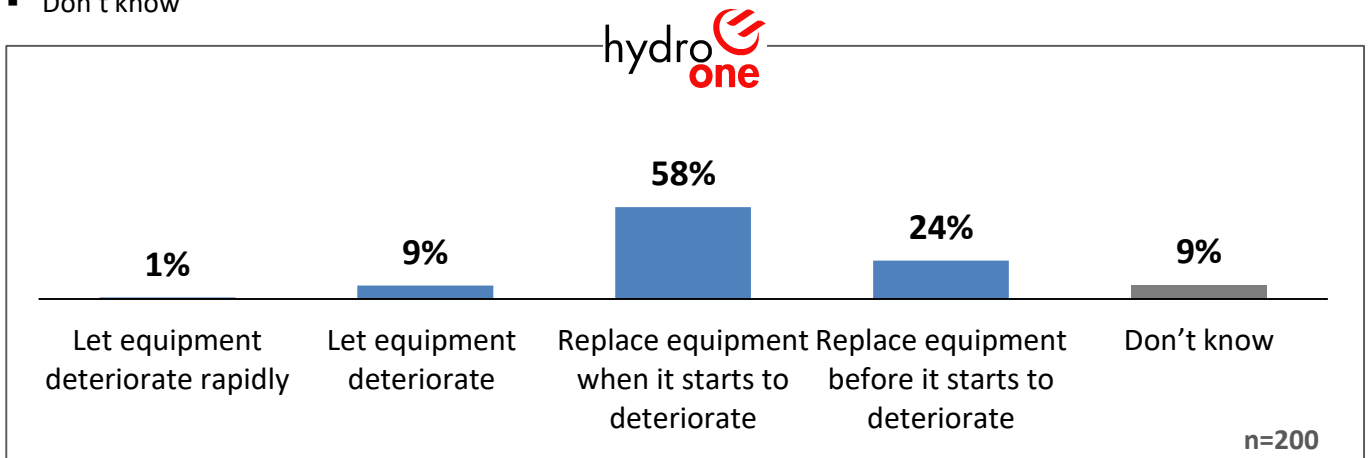


## Keeping Pace with Aging Distribution Infrastructure



Which of the following statements best represents your point of view regarding Hydro One's approach to dealing with aging infrastructure?

- **Let Equipment Deteriorate Rapidly:** Hydro One should **decrease its current level of investment** in aging equipment to keep annual rate increases for new equipment between **\$1 and \$2** on my organization's monthly bill, even if it means the share of aging equipment will grow rapidly and future rate increases will be very steep.
- **Let Equipment Deteriorate:** Hydro One should **maintain its current level of investment** in aging infrastructure to keep annual rate increases for new equipment **between \$2 and \$3** on my organization's monthly bill, even if it means equipment will age faster than it is replaced (but less quickly than in the scenario above) and future rate increases will be steep.
- **Replace Equipment When It Starts to Deteriorate:** Hydro One should **increase its current level of investment** in aging infrastructure to keep annual rate increases for new equipment **between \$3 and \$4** on my organization's monthly bill, to keep pace with aging equipment and enable smoother rate increases in the future.
- **Replace Equipment Before It Starts to Deteriorate:** Hydro One should **increase its current level of investment** in aging equipment to keep annual rate increases for new equipment at **a little over \$5** on my organization's monthly bill, which will improve the average age of equipment and enable stable rate increases in the future.
- Don't know



	Total	Southern	Central	Eastern	Northern
Let equipment deteriorate rapidly	1%	1%	1%	1%	-
Let equipment deteriorate	9%	8%	10%	11%	4%
Replace equipment when it starts to deteriorate	58%	56%	56%	58%	63%
Replace equipment before it starts to deteriorate	24%	28%	24%	20%	22%
Don't know	9%	6%	9%	10%	11%



## Keeping Pace with Aging Distribution Infrastructure

Q

Which of the following statements best represents your point of view regarding Hydro One's approach to dealing with aging infrastructure?

<b>Additional Comments (n=33)</b>	<b>n-size</b>
83% of respondents did not provide additional feedback	
Decrease operation costs, salaries/alternative financing etc.	7
Consider cost	6
Tech/equipment improvements	4
New underground lines /alternative materials for poles	3
Replace equipment after getting its value, but before it becomes a problem	2
Be transparent and accountable with plans and spending	2
Customers shouldn't pay more/extra for maintenance and upgrades	2
Preventative maintenance	1
Better and more reliable electricity	1
Safety is paramount	1
Other	3
None	1
Don't know	1

# Online Workbook

## Ensuring Day-to-Day Reliability

Small Business



### Making Choices for Hydro One's Distribution System

As previously mentioned, Hydro One's service territory is much larger and includes more rural areas than those of other electricity distributors in Ontario. Due to this geography, Hydro One's distribution system looks different than other distribution systems in Ontario.

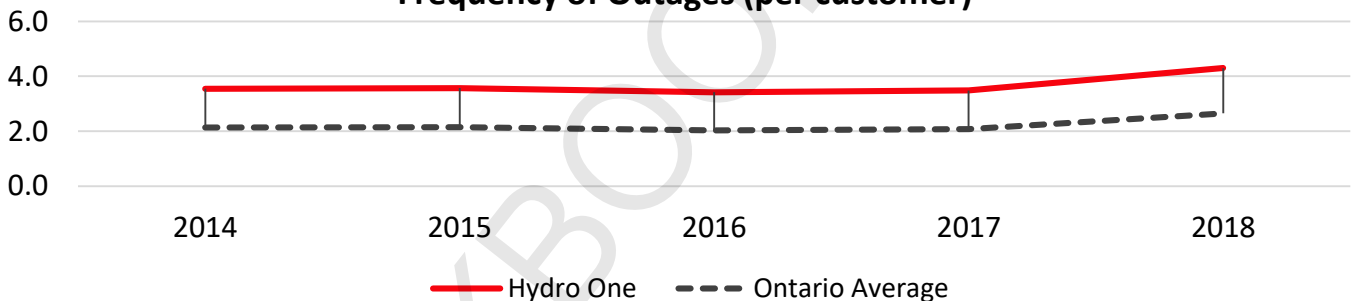
When Hydro One's system was first built, simple *radial lines* were constructed in rural areas. A radial line has only one power source for a group of customers. A power failure, short-circuit, or a downed power line interrupts power for all customers further down the line. While a *looped line* can restore power by bringing it in from another direction, power cannot be restored in a radial line until the source of the outage is found and repaired.

Compared to other local distribution companies, Hydro One now has more of those radial lines. They are less reliable than looped lines, which are standard in denser urban areas.

Hydro One tracks both the average number of power outages per customer and how long those outages last. The average Hydro One customer experiences more frequent and longer outages than the average Ontarian.

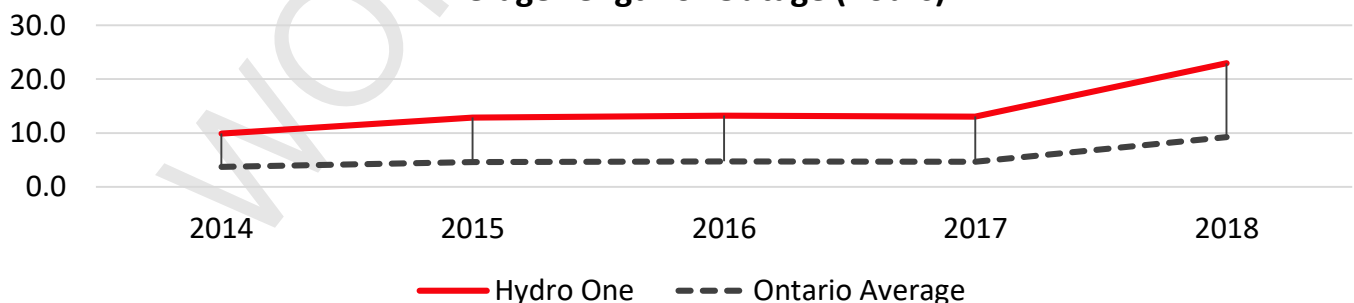
On average, between 2014 and 2018, the typical Hydro One customer has experienced 1.5 more outages per year compared to the Ontario average.

**Frequency of Outages (per customer)**



When it comes to total time spent without electricity each year, the typical Hydro One customer, since 2014, has been without power for 14.4 hours each year. That is 9 hours more than the Ontario average.

**Average Length of Outage (hours)**



There are investments that Hydro One can make to improve reliability, especially of radial lines, such as remote monitoring, remotely operable equipment and battery storage. While these investments are likely to reduce both the number and length of outages, they would add to the costs of the system.

# Online Workbook

## Ensuring Day-to-Day Reliability

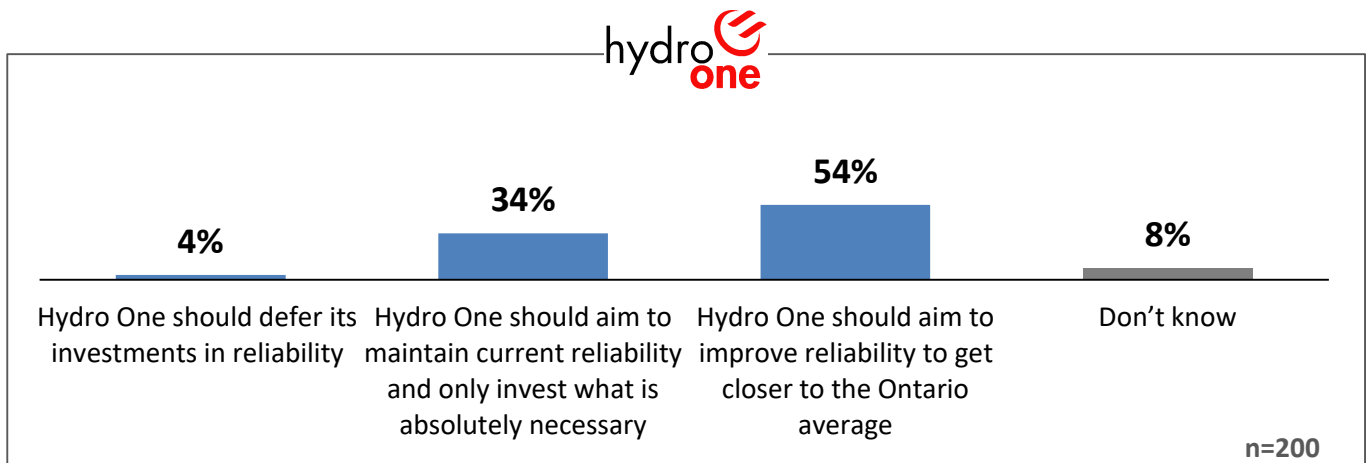
Small Business



Q

Which of the following statements best represents your point of view regarding Hydro One's approach to ensuring day-to-day reliability?

- Hydro One should defer its investments in reliability to keep costs down, even if this could lead to more or longer power outages in the future.
- Hydro One should aim to maintain current reliability and only invest what is absolutely necessary to maintain the current level of reliability, even if that increases my organization's monthly bill by **a little more than \$1** each year.
- Hydro One should aim to improve reliability to get closer to the Ontario average, even if that increases my organization's monthly bill by **a little more than \$3** each year.
- Don't know



	Total	Southern	Central	Eastern	Northern
Hydro One should defer its investments in reliability	4%	3%	5%	5%	2%
Hydro One should aim to maintain current reliability and only invest what is absolutely necessary	34%	34%	34%	35%	30%
Hydro One should aim to improve reliability to get closer to the Ontario average	54%	57%	50%	53%	56%
Don't know	8%	6%	11%	7%	13%

# Online Workbook

## Ensuring Day-to-Day Reliability

Small Business



Q

Which of the following statements best represents your point of view regarding Hydro One's approach to ensuring day-to-day reliability?

<b>Additional Comments (n=29)</b>	<b>n-size</b>
86% of respondents did not provide additional feedback	
Find internal efficiencies/reduce operating costs	7
Reduce cost/no increases	4
Reliability/safety over cost	3
Minor outages acceptable/satisfied with current service	2
Use profits/customers should not pay	2
Upgrade infrastructure only when necessary/conservative approach	1
Leading biased questionnaire only seeking to raise bills	1
Be transparent with plans/associated costs more info needed	1
Undertake preventative maintenance	1
Investment/improvements necessary	1
Be proactive/will only cost more in future	1
Protect/strengthen infrastructure	1
Other	1
Refused	2

# Online Workbook

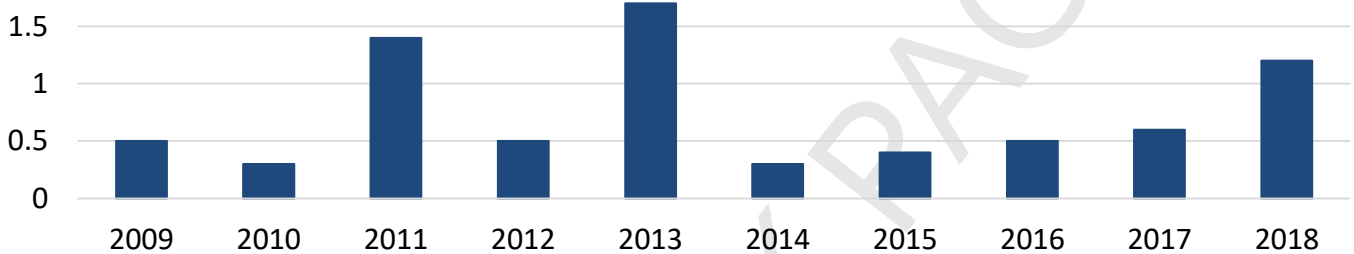
## Responding to Severe Weather



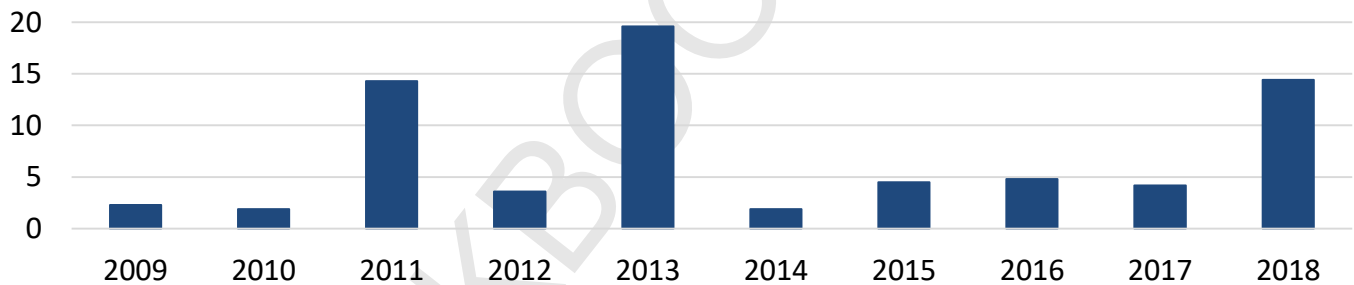
### Making Choices for Hydro One's Distribution System

Over the past ten years, severe weather, such as ice storms, windstorms or thunderstorms, has caused multiple outages that tended to last longer than regular day-to-day outages. In 2018, the average Hydro One customer was without power for an average total of 7 hours due to day-to-day outages. When the effect of storms are included, the total average duration was 23 hours for the average Hydro One customer.

#### Frequency of Outages (per customer) Caused by Severe Weather



#### Average Duration of Outages (hours) Caused by Severe Weather



The occurrence and severity of weather events are largely unpredictable. The number and duration of outages caused by severe weather have varied year-by-year.

Currently, Hydro One does not have a designated program to focus on minimizing the impacts of severe weather. However, there are investments Hydro One could make to make the system more resilient to help mitigate the potential impacts of severe weather. These types of investments could include building infrastructure to a higher, more redundant standard.

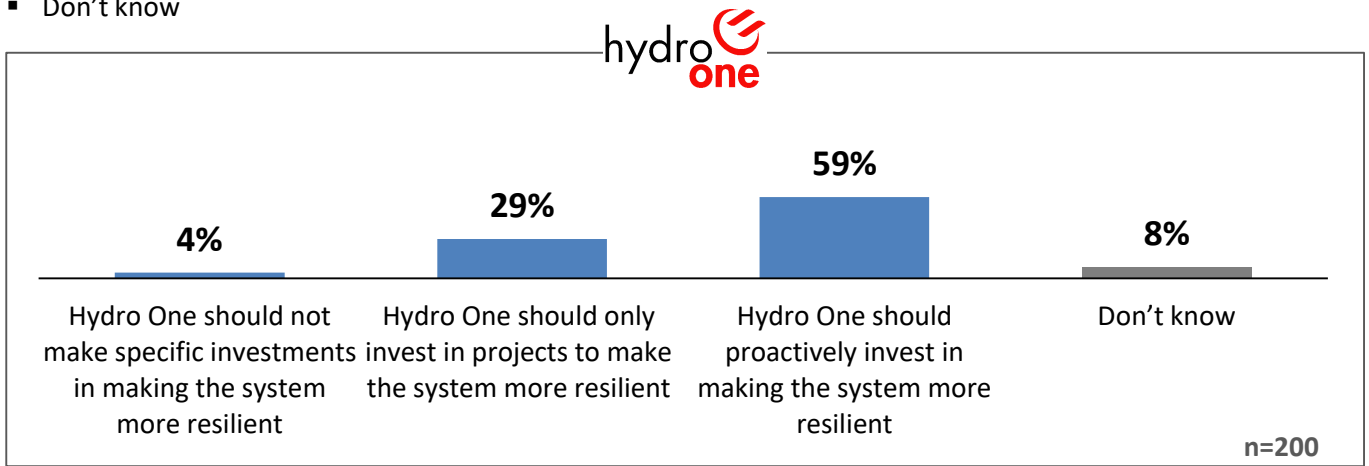
Any investments Hydro One would make would be based on previous experience and estimates of future major events. However, because major events are unpredictable, these investments may not match the events Hydro One actually experiences.





Which of the following statements best represents your point of view?

- In order to keep rates down, Hydro One should not make specific investments in making the system more resilient to severe weather, even if that means no improvements or potential increases in the length and number of outages caused by severe weather.
- Hydro One should only invest in projects to make the system more resilient to severe weather as part of the ongoing replacement of old or failing equipment, but not more, even if that increases my organization’s monthly bill by **less than 25 cents** each year.
- Hydro One should proactively invest in making the system more resilient in order to reduce the length and number of outages caused by severe weather, even if that increases my organization’s monthly bill by **less than \$1** each year.
- Don’t know



	Total	Southern	Central	Eastern	Northern
Hydro One should <u>not</u> make specific investments in making the system more resilient	4%	4%	10%	-	4%
Hydro One should only invest in projects to make the system more resilient	29%	31%	22%	28%	34%
Hydro One should proactively invest in making the system more resilient	59%	61%	57%	64%	51%
Don't know	8%	5%	12%	8%	10%

# Online Workbook

## Responding to Severe Weather

Small Business



Q Which of the following statements best represents your point of view?

<b>Additional Comments (n=27)</b>	<b>n-size</b>
86% of respondents did not provide additional feedback	
Protect and strengthen infrastructure, especially burying lines	6
Survey is leading, just about raising bills, otherwise critical of survey	3
Consider climate change, more severe weather, environment	3
Improve service reliability	2
Reduce cost for customer	2
Find efficiencies to reduce cost in operations, especially salaries	2
Alternative, green energy sources	2
Investment in improvement is necessary, even if it costs	1
Perform preventative maintenance	1
Use profits to improve system, not higher bills	1
Other	3
None	2



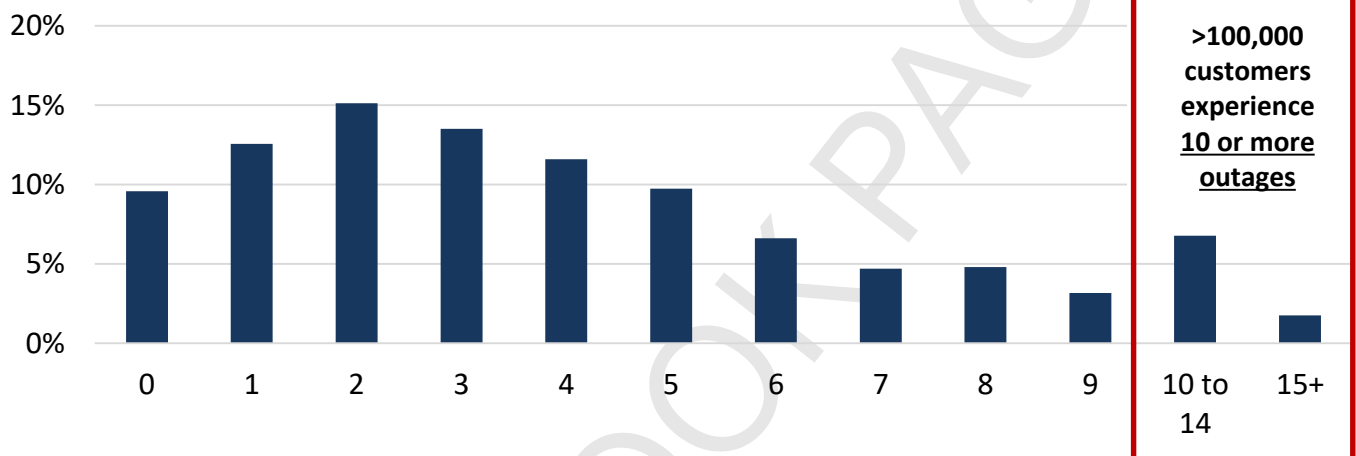
## Helping Customers with Poor Reliability

### Making Choices for Hydro One's Distribution System

Hydro One customers experience different levels of reliability, depending on where they live, equipment and the historical legacy of when the system was built.

While some Hydro One customers didn't experience any outages in 2017 or 2018, others were without power more than 15 times per year. Similarly, the total length of time that customers were without power ranged from less than one hour to more than 50 hours per year.

### Average Number of Outages Per Customer (2018)



There are investments Hydro One can make to bring customers experiencing poor reliability closer to the system average. This includes modernizing certain distribution lines by adding remote monitoring, switches to detect and isolate the cause of a power interruption, and batteries to minimize the impact on customers.

#### There are two ways Hydro One can fund improvements for these customers:

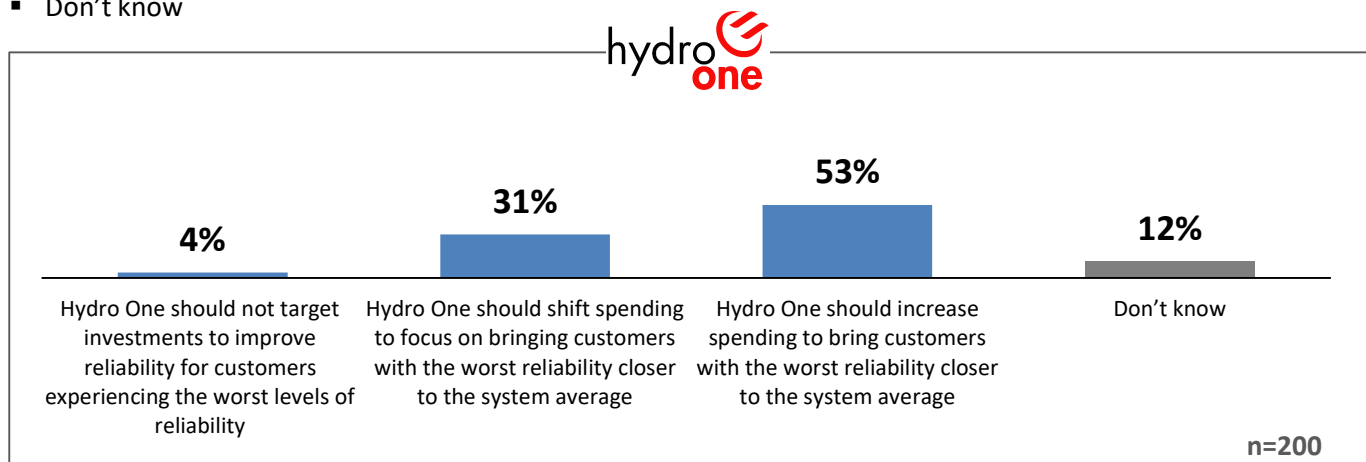
- Hydro One can shift spending away from circuits that experience average or better reliability to those with poor reliability. That will mean customers on circuits with average or better reliability will likely experience small declines in reliability, while customers with the worst reliability will see significant improvements.
- Hydro One can increase spending to provide additional resources for customers with the worst reliability and keep spending the same on circuit with average or better reliability. With this approach, no customer will be worse off, while customers with the worst reliability will see significant improvements.



## Helping Customers with Poor Reliability

Q Which of the following statements best represents your point of view?

- Hydro One should not target investments to improve reliability for customers experiencing the worst levels of reliability in order to keep costs down, even if that leaves some with worse reliability than others.
- Hydro One should shift spending to focus on bringing customers with the worst reliability closer to the system average without raising prices, even if that means that reliability may go down for customers whose reliability is currently average or above.
- Hydro One should increase spending to bring customers with the worst reliability closer to the system average, even if that increases my organization's monthly bill by **less than 50 cents** each year.
- Don't know



	Total	Southern	Central	Eastern	Northern
Hydro One should <u>not</u> target investments to improve reliability for customers experiencing the worst levels of reliability	4%	2%	7%	4%	4%
Hydro One should shift spending to focus on bringing customers with the worst reliability closer to the system average	31%	31%	26%	37%	30%
Hydro One should increase spending to bring customers with the worst reliability closer to the system average	53%	59%	49%	49%	50%
Don't know	12%	7%	17%	11%	16%



**Q** Which of the following statements best represents your point of view?

<b>Additional Comments (n=18)</b>	<b>n-size</b>
91% of respondents did not provide additional feedback	
Keep rates low - stop increasing	5
Issues with survey / need more information	3
Hydro one should pay- make cuts from within	2
Some outages are to be expected	1
Money should be spent for the biggest improvement for the most people	1
Money must be spent (wisely)	1
Other	4
Refused	2



### Making Choices for Hydro One's Distribution System

One of the issues that Hydro One planners face is whether to continue building out the distribution system in areas where economic development is expected to lead to future growth. Certain pockets across Ontario are experiencing regional growth and economic development, which leads to the need for greater investments in infrastructure to meet the demand for electricity.

Currently, in order to keep rates low, Hydro One **reactively increases the capacity of its system** to address community and economic growth. That means Hydro One only adds new capacity to its system when there are firm expectations of new demand and most of the costs to expand are borne by the connecting customers.

Some communities have expressed concern that, with this approach, it is difficult to attract new businesses to their community. For instance, not all communities currently have access to the level of power needed to grow and attract new businesses. While the level of power required to service a home is available across Hydro One's service territory, some businesses, including gas stations, grocery stores, and motels, require a greater electrical capacity to operate.

To help regional and economic development, Hydro One could take on a more **proactive role** and make the investments necessary to increase the capacity needed to supply communities where future growth is projected. If Hydro One responds to these communities and builds that capacity, all Hydro One customers will share the cost of adding this infrastructure, particularly if no businesses come. Communities say that attracting new business will increase demand and that will spread the costs out.

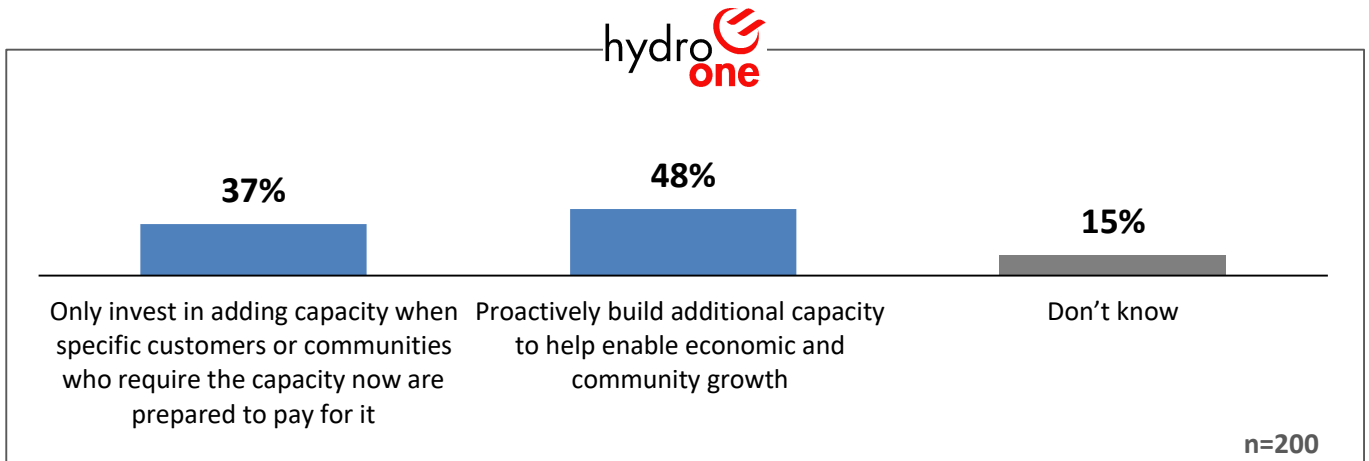
The question is whether customers would like Hydro One to promote or react to economic growth in the communities it operates in.





Which of the following statements best represents your point of view?

- Hydro One should only invest in adding capacity when specific customers or communities who require the capacity now are prepared to pay for it.
- Where a local community asks for it, Hydro One should proactively build additional capacity to help enable economic and community growth based on a forecast of the area’s future requirements, even if these investments increase my organization’s monthly electricity bill by **a little more than \$1** each year.
- Don’t know



	Total	Southern	Central	Eastern	Northern
Hydro One should only invest in adding capacity when specific customers or communities who require the capacity now are prepared to pay for it	37%	36%	43%	37%	32%
Hydro One should proactively build additional capacity to help enable economic and community growth	48%	50%	38%	54%	50%
Don't know	15%	14%	19%	9%	18%



Q Which of the following statements best represents your point of view?

<b>Additional Comments (n=17)</b>	<b>n-size</b>
92% of respondents did not provide additional feedback	
Good planning and working with communities	4
Developers/communities requiring services should pay	3
Keep rates down	2
Hydro One should pay- make cuts from within	1
Manufacturing - general	1
Critical of question/survey	1
Consider green/alternative technology	1
Upgrade services/capacity	1
Other	2
None	1
Refused	1





## Keeping Hydro One's Business Running

### Making Choices for Hydro One's Distribution System

Hydro One is more than just poles and wires – it's a business that needs to invest in equipment such as tools, trucks, buildings, computers and software.

When deciding whether to continue to maintain existing equipment or replace them, Hydro One considers whether the risks and costs of continuing to use it outweigh the benefits of waiting longer to replace it. Delaying investments may make it harder for staff to do their jobs safely and maintain reliability and security standards.

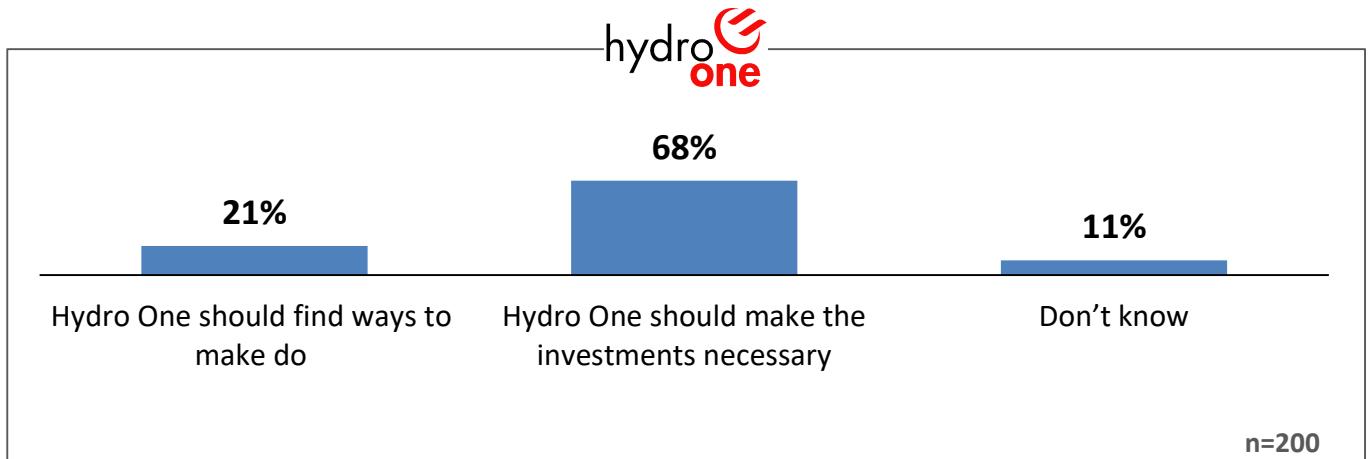




## Keeping Hydro One's Business Running

**Q** Which of the following statements best represents your point of view?

- Hydro One's should find ways to make do with the facilities, equipment, vehicles and IT and computer systems it already has and only replace the equipment with the most urgent needs, even if that means increasing risk to safety, reliability, and security.
- Hydro One's should make the investments necessary to ensure its staff will have access to equipment of the same standard as similar sized businesses.
- Don't know



	Total	Southern	Central	Eastern	Northern
Hydro One should find ways to make do	21%	13%	24%	32%	15%
Hydro One should make the investments necessary	68%	76%	64%	57%	77%
Don't know	11%	11%	12%	11%	8%



**Q** Which of the following statements best represents your point of view?

<b>Additional Comments (n=22)</b>	<b>n-size</b>
89% of respondents did not provide additional feedback	
Find efficiencies in operation cost, especially salaries	5
Survey is leading, not giving enough options, biased	4
Invest prudently, only in most necessary equipment	3
Lower cost for consumer	3
Workers need safe, reliable equipment	2
Perform thorough maintenance to get more value	2
Keep tech and equipment up to date, prioritize service	1
Other	1

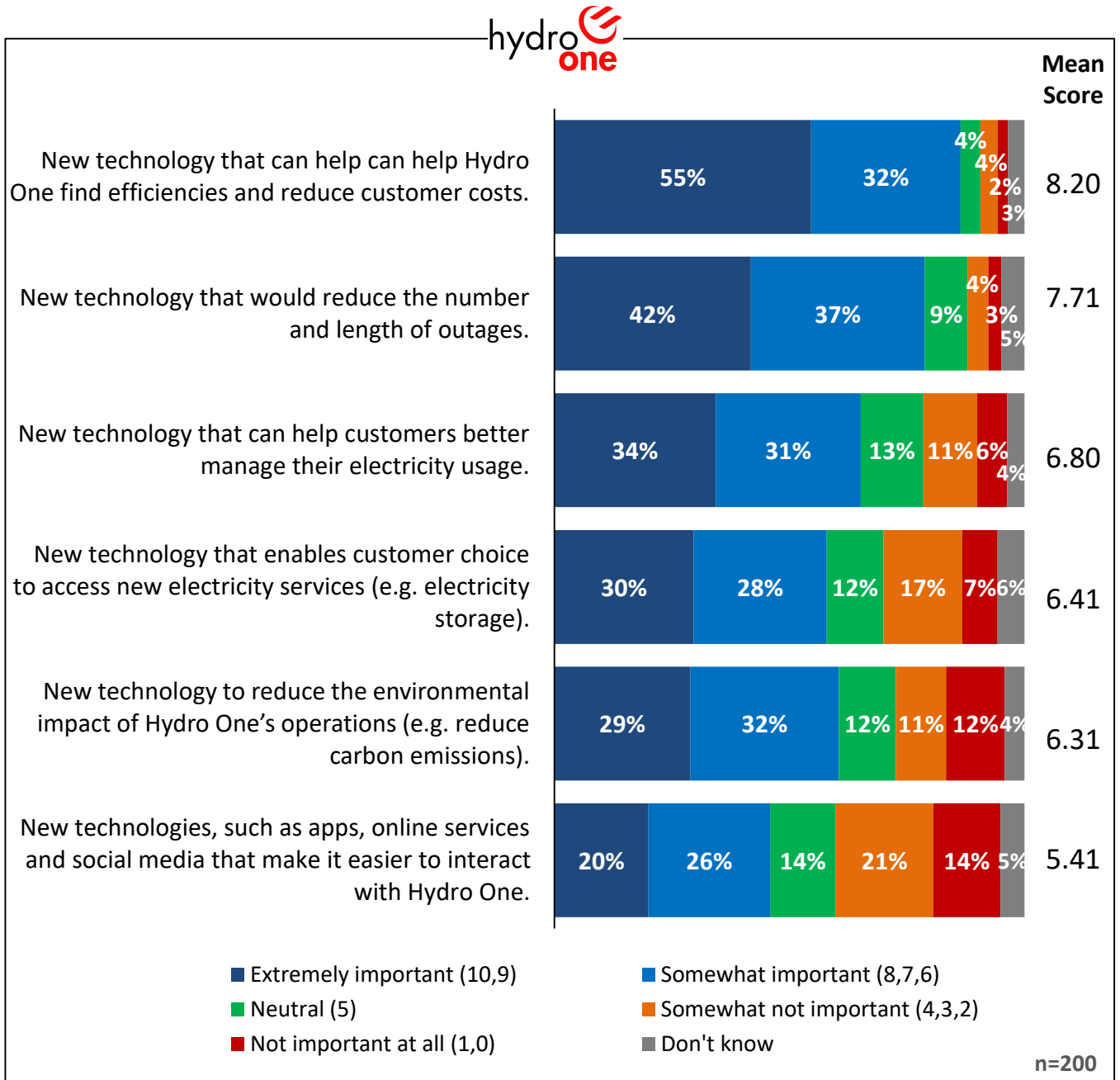
# Online Workbook

## Investing in New Technology



Another investment category is related to new technology that Hydro One could invest in to address a range of issues. These include reliability, efficiency, customer service, Hydro One’s impact on the environment, new service offerings and tools to manage electricity usage.

**Q** How important are each of the following investments in new technology that Hydro One could focus on?



# Online Workbook

## Investing in New Technology



Another investment category is related to new technology that Hydro One could invest in to address a range of issues. These include reliability, efficiency, customer service, Hydro One's impact on the environment, new service offerings and tools to manage electricity usage.

Q

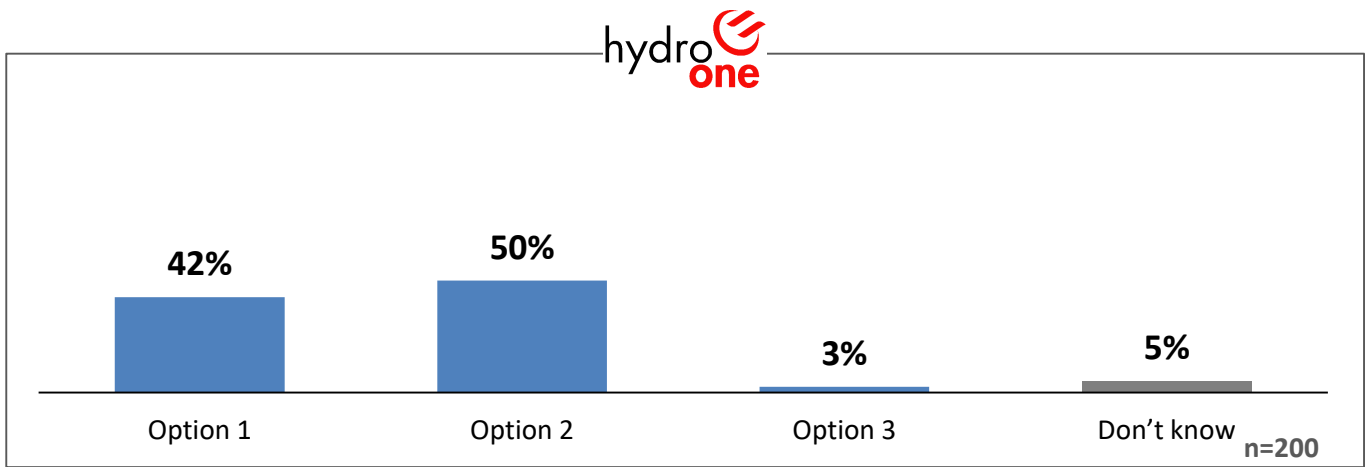
How important are each of the following investments in new technology that Hydro One could focus on? BY **Mean Score**

	Total	Southern	Central	Eastern	Northern
New technology that can help can help Hydro One find efficiencies and reduce customer costs.	8.20	8.27	8.40	7.86	8.36
New technology that would reduce the number and length of outages.	7.71	7.86	7.51	7.56	7.92
New technology that can help customers better manage their electricity usage.	6.80	7.01	6.99	6.27	6.98
New technology to reduce the environmental impact of Hydro One's operations (e.g. reduce carbon emissions).	6.41	6.83	6.24	6.26	6.03
New technology that enables customer choice to access new electricity services (e.g. electricity storage).	6.31	6.34	6.66	6.11	6.10
New technologies, such as apps, online services and social media that make it easier to interact with Hydro One.	5.41	5.88	5.58	5.04	4.85



Which of the following statements best represents your point of view when it comes to investing in new technologies?

- **Option 1:** Hydro One should only invest in new technologies if there is clear evidence that these technologies will lead to positive outcomes.
- **Option 2:** Hydro One should pursue Option 1 and also invest in pilot projects for new technologies where the company sees a good chance that it would lead to positive outcomes.
- **Option 3:** Hydro One should not invest in these new technologies.
- Don't know



	Total	Southern	Central	Eastern	Northern
Option 1	42%	38%	57%	35%	43%
Option 2	50%	55%	37%	58%	45%
Option 3	3%	3%	2%	5%	-
Don't know	5%	5%	4%	2%	12%



Q

Which of the following statements best represents your point of view when it comes to investing in new technologies?

Additional Comments (n=11) 94% of respondents did not provide additional feedback	n-size
Only make investments that are proven to work and improve service	2
Growth and new technology is essential	2
Make investments that are proven to reduce customer bills	1
Prepare for rise in electric vehicles	1
Money for investment should come from profits, not increased bills	1
Ensure employees are trained to keep up with technology	1
Other	3
Don't know/refused	1

# Commercial and Industrial Customers **Online Workbook Results**







## Field Dates & Workbook Delivery

The **Commercial and Industrial Online Workbook** was sent to all Hydro One C&I customers who have provided the utility with an email address. Customers had an opportunity to complete the workbook between January 13<sup>th</sup> and February 12<sup>th</sup>, 2020.

Each customer received a workbook customised to their rate class using a unique URL that could be linked back to their annual consumption, region and rate class.

In total, the C&I workbook was sent to **4,242** customers via e-blast from Hydro One.

## Commercial and Industrial Online Workbook Completes

A total of **261** (unweighted) Hydro One C&I customers completed the online workbook via a unique URL. The weighted n-size for this customer group is 250.

## Sample Weighting

The C&I online workbook sample has been weighted proportionately by region in order to be representative of the broader Hydro One service territory.

*The table below summarizes the unweighted and weighted sample breakdown by rate zone.*

	Unweighted	Weighted	Distribution
Southern	135	<b>107</b>	<b>43%</b>
Central	41	<b>50</b>	<b>20%</b>
Northern	59	<b>60</b>	<b>24%</b>
Eastern	26	<b>33</b>	<b>13%</b>
<b>Total</b>	<b>261</b>	<b>250</b>	<b>100%</b>

**Note:** *Graphs and tables may not always total 100% due to rounding. Sums are added before rounding numbers. Caution interpreting results with small n-sizes.*

## Welcome to Hydro One's Customer Engagement!

**Hydro One needs your input on choices that will impact the services you receive and the rates that you pay.**

- **Hydro One** is developing its investment plan for 2023 to 2027. This plan will determine the investments Hydro One will make in equipment and infrastructure, the services it provides, and the rates you pay.
- As **Hydro One** plans for the future, they must ensure their business decisions are aligned with customer priorities, preferences, and needs.
- **Hydro One** will be accountable to the public regulator, the Ontario Energy Board (OEB), both in terms of sharing what customers say and demonstrating how they considered those views.
- **You don't need to be an electricity expert** to participate in this engagement. This workbook is focused on basic choices and provides the background information you need to answer the questions.
- This customer engagement will take approximately 20-30 minutes to complete, depending on the level of feedback you wish to provide. Your progress will be saved as you move through the workbook, meaning you can leave and return to the customer engagement at any time.

**All individual responses will be kept confidential.** Innovative Research Group (INNOVATIVE), an independent research company, has been hired to gather your feedback.

**Those who complete the questions that follow will be invited to enter a draw to win an office lunch valued at \$500.**

If you are reading this on a smaller mobile device, you may want to consider accessing the survey from a tablet, desktop or laptop instead so that it is easier for you to read.



## Hydro One's Role in Ontario's Electricity System

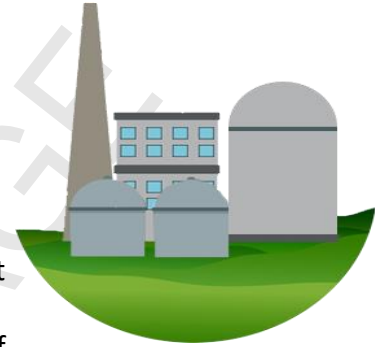
Ontario's electricity system is owned and operated by public, private, and municipal corporations across the province. It is made up of three key components: **generation**, **transmission** and **distribution**. Hydro One is involved in both electricity transmission across Ontario and distribution in many communities.

### Generation

#### Where electricity comes from.

Ontario gets its electricity from a mix of energy sources. About half comes from nuclear power. The remainder comes from a mix of hydroelectric and natural gas, and to a lesser extent, wind and solar.

Ontario Power Generation, a government-owned company, generates almost half of Ontario's electricity. The other half comes from multiple generators who have contracts with the grid operator to provide power from a variety of sources.

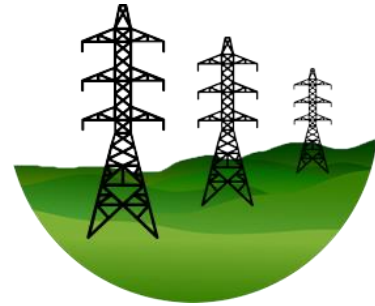


### Transmission

#### Electricity travels across Ontario.

Once electricity is generated, it must be transported to urban and rural areas across the province. This happens by way of high voltage transmission lines that serve as highways for electricity. Often these lines are suspended on large, steel lattice towers. The province has more than 30,000 km of transmission lines, and almost all are owned by Hydro One.

Hydro One provides transmission services to most electricity customers in Ontario.

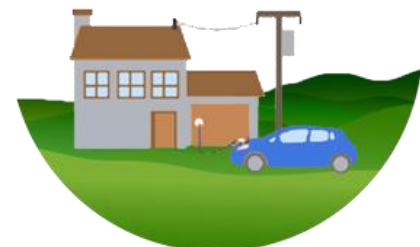
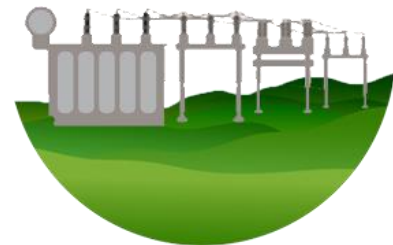


### Local Distribution

#### Delivering power to homes and businesses in your community.

In many communities, Hydro One is also responsible for the last step of the journey: delivering electricity to customers through its distribution system. This local distribution system includes transformer stations that decrease the voltage of the electricity so it can be used safely in your home or business.

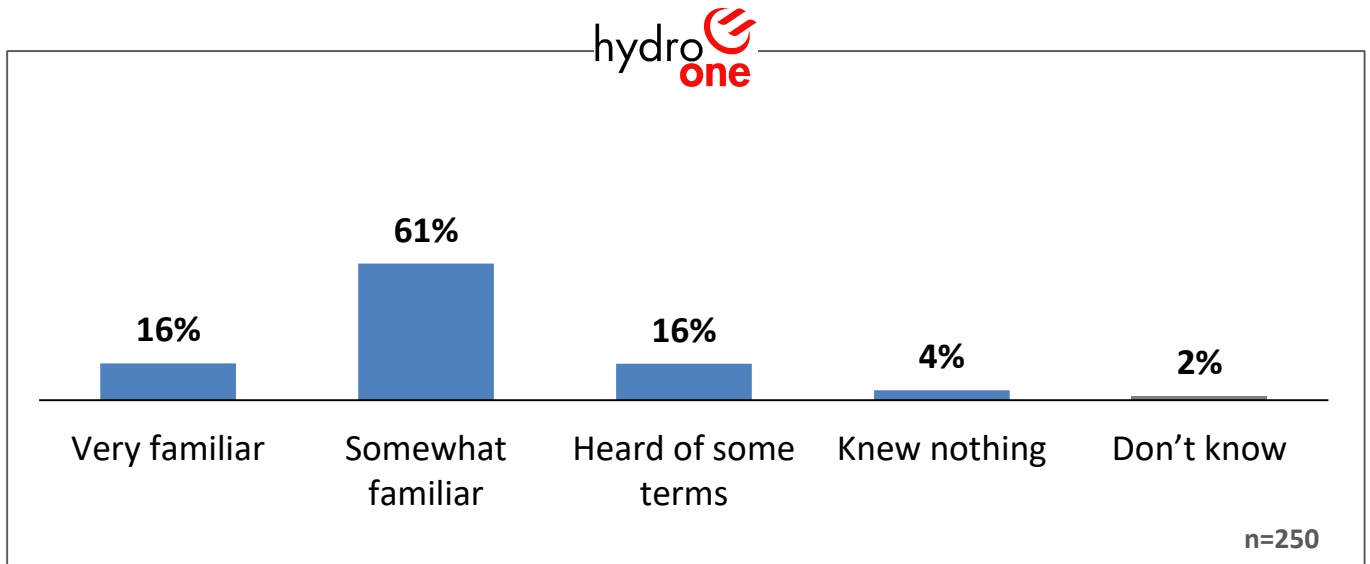
While there are many distributors across Ontario, Hydro One builds, operates and maintains this distribution system that serves you. Hydro One reads meters, calculates and collects bills for all parts of the electricity system and answers customer calls.





Q

Before this survey, how familiar were you with the various parts of the electricity system and how they work together?



	Total	Southern	Central	Eastern	Northern
Very familiar and could explain the details	16%	22%	17%	8%	12%
Somewhat familiar with the system but could not explain all the details	61%	54%	63%	64%	73%
Had heard of some of the terms and organizations mentioned	16%	14%	15%	22%	15%
I knew nothing about how the provincial electricity system works	4%	7%	2%	3%	-
Don't know	2%	2%	2%	2%	-



## Who is Hydro One?

### Electricity 101

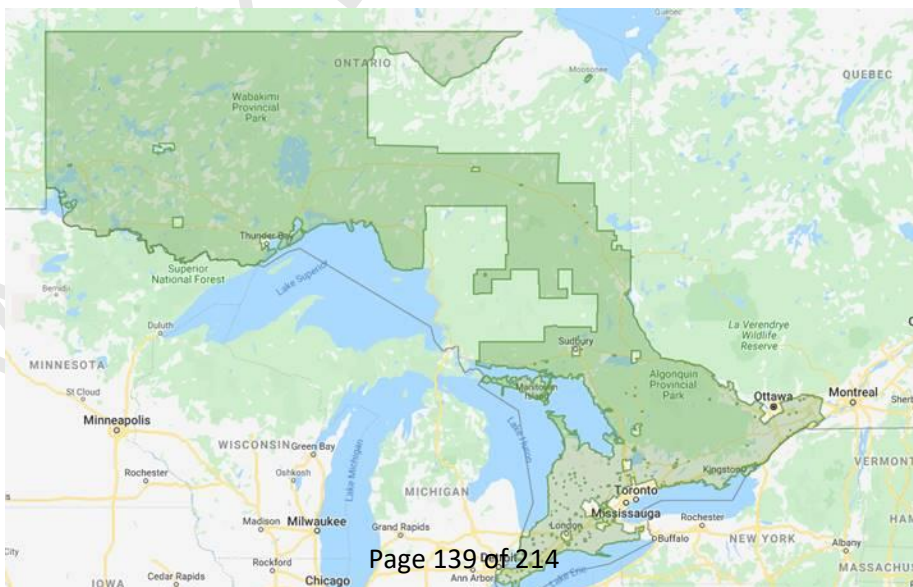
- Hydro One is Ontario's largest electricity transmission and distribution service provider.
- Hydro One is a publicly traded corporation. Its largest shareholder is the Government of Ontario.
- Hydro One is regulated by the Ontario Energy Board (OEB) and must apply to the OEB for approval of the amount it charges for its services.

### Hydro One's Transmission System

- Hydro One's transmission system takes electricity from generators (i.e. the Adam Beck facility at Niagara Falls or the Bruce Power nuclear power plant) and transports it via high-voltage transmission lines to local communities, where the voltage is lowered ("stepped-down") so you can use it in your home or business.
- Hydro One's transmission system serves 98% of electricity customers in Ontario.

### Hydro One's Distribution System

- Hydro One is also required by law to distribute electricity across Ontario to any customer not otherwise served by a local distribution company. This means that Hydro One's nearly 1.4 million customers are predominantly rural customers.
- Hydro One's local distribution system, which brings electricity to your home through a network of wires, poles and other equipment, covers approximately 75% of the geographic area of Ontario.
- Compared to other electricity distributors in the province, Hydro One's service territory is much larger and includes more rural and remote areas.

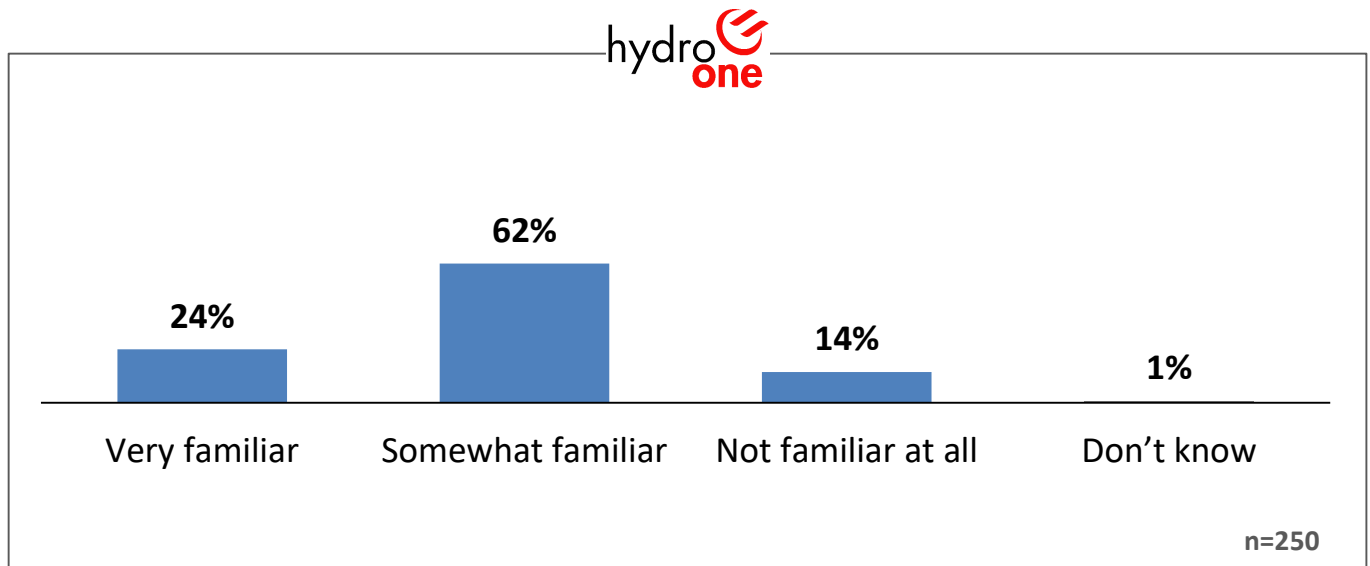




## Who is Hydro One?

Q

How familiar are you with Hydro One, which operates the transmission system across the province and the electricity distribution system in your community?



	Total	Southern	Central	Eastern	Northern
Very familiar	24%	27%	17%	19%	31%
Somewhat familiar	62%	58%	68%	64%	62%
Not familiar at all	14%	14%	15%	15%	8%
Don't know	1%	1%	-	2%	-



## How much of my bill goes to Hydro One?

### Electricity 101

- Every item and charge on your organization's bill is mandated by the provincial government or regulated by the Ontario Energy Board (OEB), the provincial energy regulator.
- While Hydro One is responsible for collecting payment for the entire electricity bill, it only keeps about 34% or \$2,683.67 of the average business customer's bill in your rate class.
- This amount is split into 28% (\$2,240.19) for distribution, and 6% for transmission (\$443.47).
- The rest of the bill goes to power generation companies, taxes, and regulatory agencies.
- The average Hydro One business customer consumes 36,104 kWh per month. However, your organization's consumption may vary.

### Breakdown of Monthly Bill

#### Hydro One Sample Monthly Bill\* (Based on monthly usage of 36,104 kWh)

Account Number:  
000 000 000 000 0000

Meter Number:  
00000000

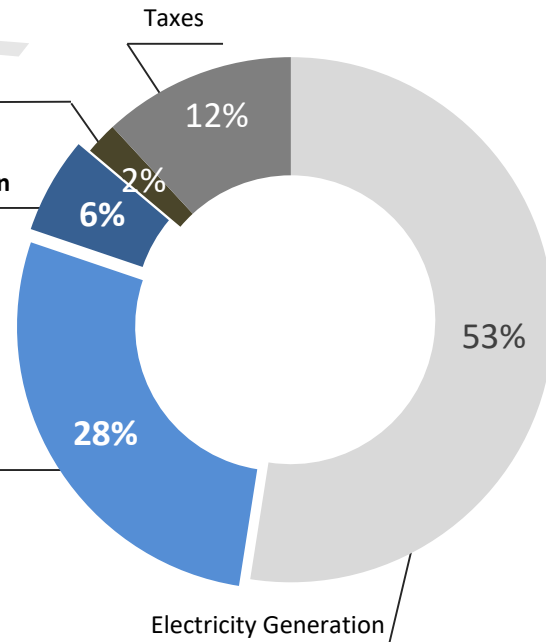
#### Your Electricity Charges

Electricity	4,149.51
<b>Delivery</b>	<b>2,683.67</b>
Regulatory Charges	149.64
<b>Total Electricity Charges</b>	<b>\$6,982.82</b>
HST	907.77
<b>Total Amount</b>	<b>\$7,809.59</b>

Regulatory Charges

**Delivery:**  
**Hydro One Transmission**

**Delivery:**  
**Hydro One Distribution**

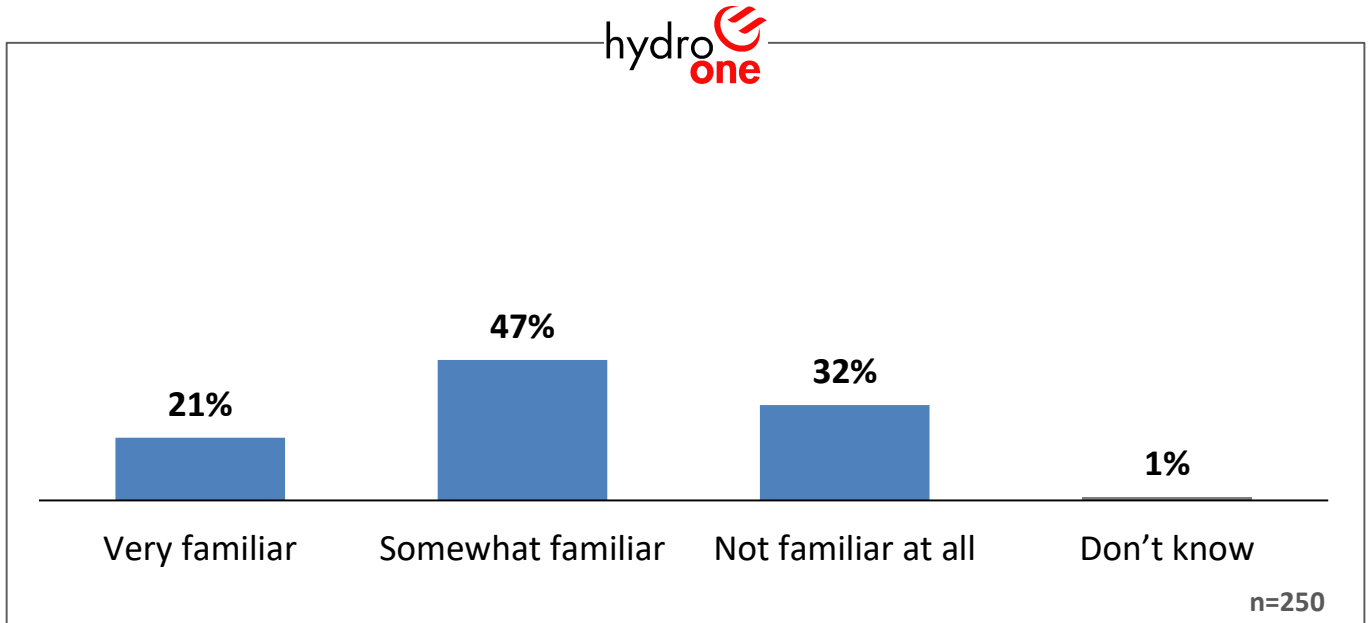




## How much of my bill goes to Hydro One?

Q

Before this survey, how familiar were you with the amount of your organization's electricity bill that went to Hydro One?



	Total	Southern	Central	Eastern	Northern
Very familiar	21%	23%	20%	19%	19%
Somewhat familiar	47%	47%	46%	47%	42%
Not familiar at all	32%	29%	34%	31%	38%
Don't know	1%	1%	-	3%	-

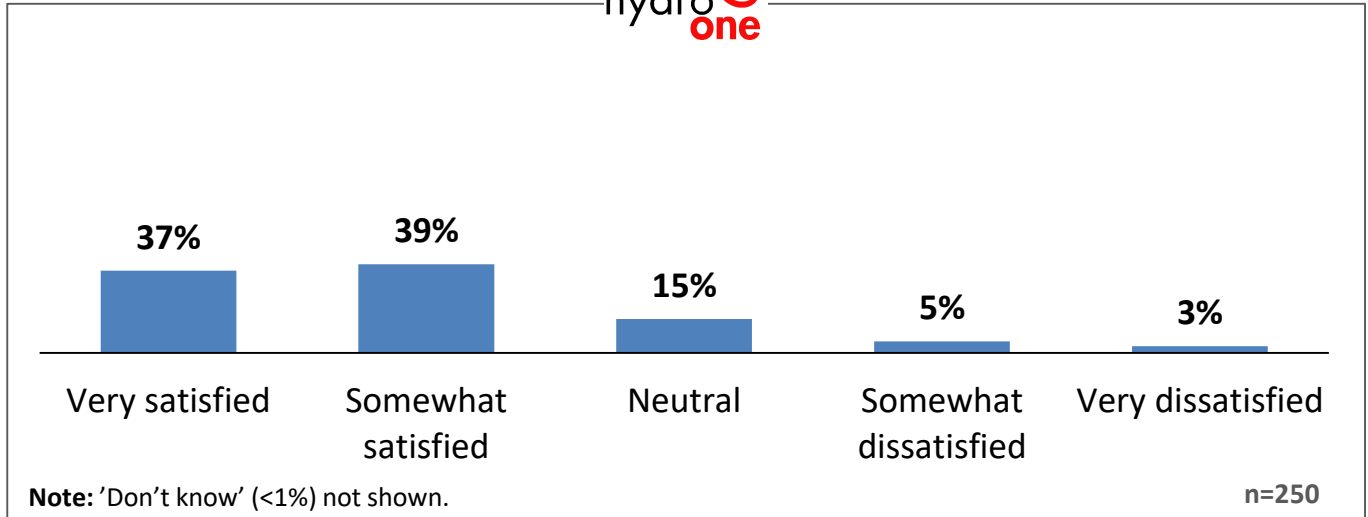




## Satisfaction with Hydro One's Services

Q

Thinking specifically about the services provided to you and your community by Hydro One, overall, how satisfied or dissatisfied are you with the services that you receive?

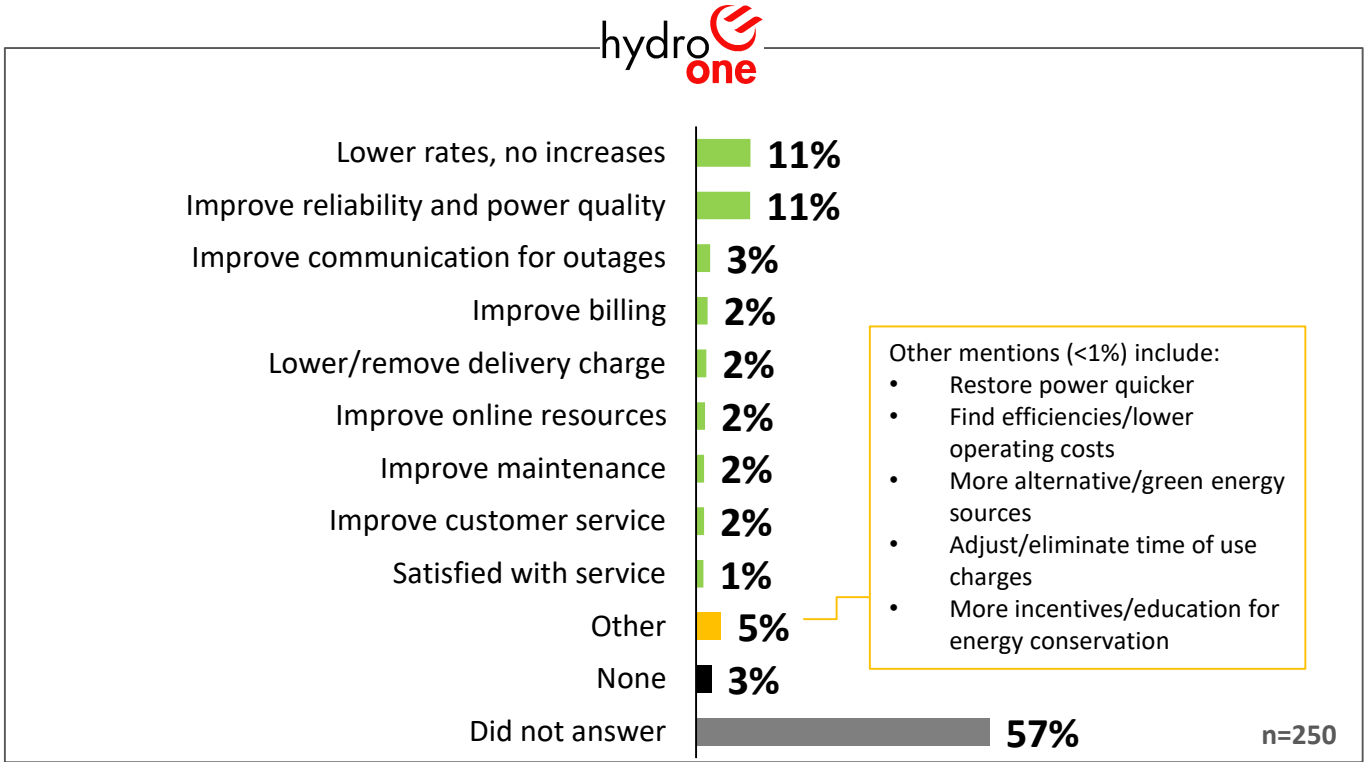


	Total	Southern	Central	Eastern	Northern
Very satisfied	37%	37%	34%	37%	38%
Somewhat satisfied	39%	47%	29%	41%	27%
Neutral	15%	10%	24%	12%	23%
Somewhat dissatisfied	5%	4%	10%	5%	4%
Very dissatisfied	3%	1%	2%	5%	8%
Don't know	0%	1%	-	-	-
<b>Overall satisfied</b>	<b>76%</b>	<b>84%</b>	<b>63%</b>	<b>78%</b>	<b>65%</b>
<b>Overall dissatisfied</b>	<b>8%</b>	<b>4%</b>	<b>12%</b>	<b>10%</b>	<b>12%</b>



## Satisfaction with Hydro One's Services

**Q** Is there anything in particular you would like Hydro One to do to improve its services to you?

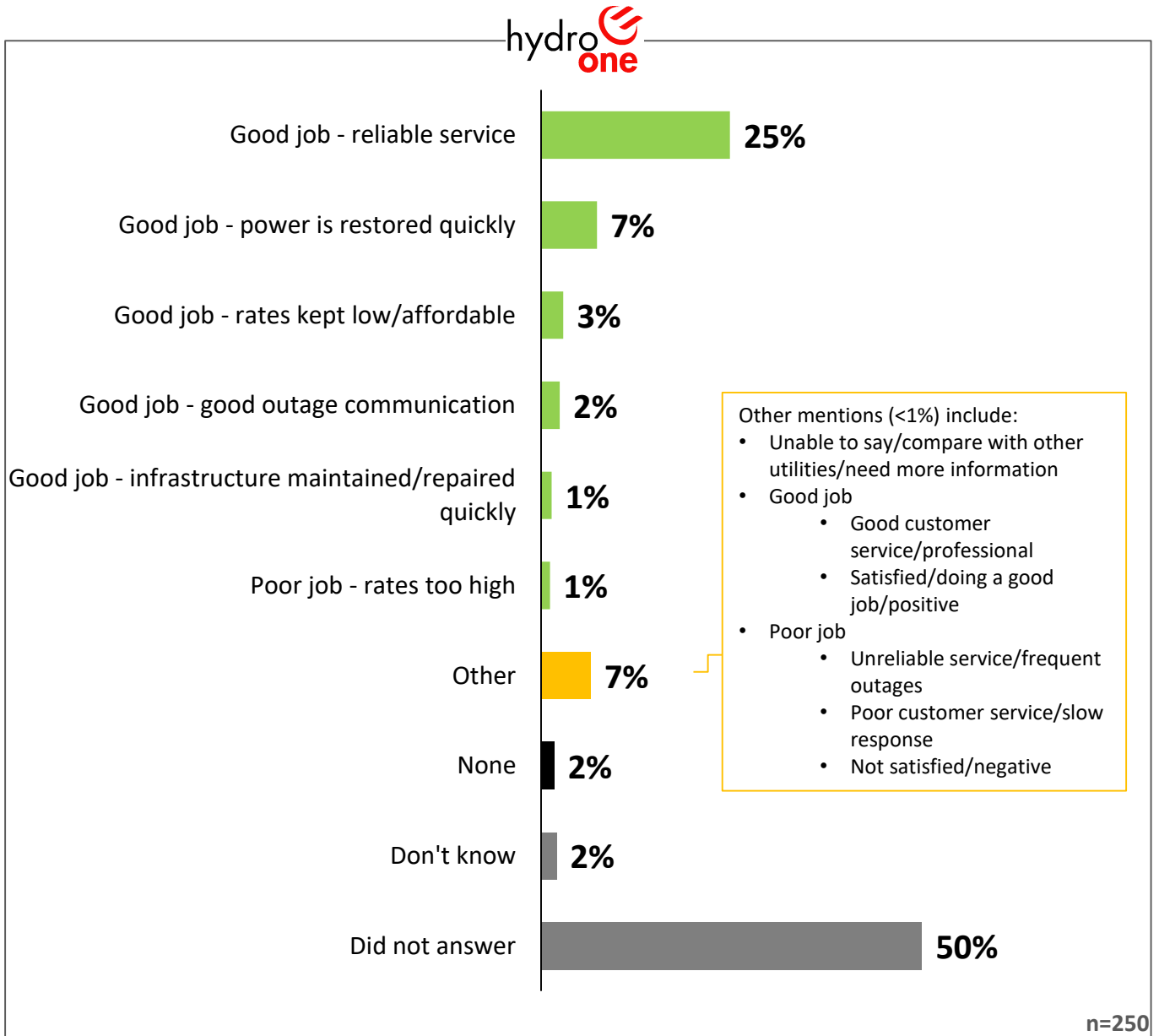


Needs	% agree the cost of my electricity bill has a major impact	% agree consumers are well served by the electricity system
Lower rates, no increases	11%	10%
Improve reliability and power quality	11%	10%
Improve communication for outages	3%	3%
Improve billing	2%	2%
Lower/remove delivery charge	1%	2%
Improve online resources	2%	2%
Improve maintenance	1%	2%
Improve customer service	1%	1%
Satisfied with service	1%	2%



## Satisfaction with Hydro One's Services

Q How do you know if Hydro One is doing a good job for you, or not?



# Online Workbook

## Outcome Priorities

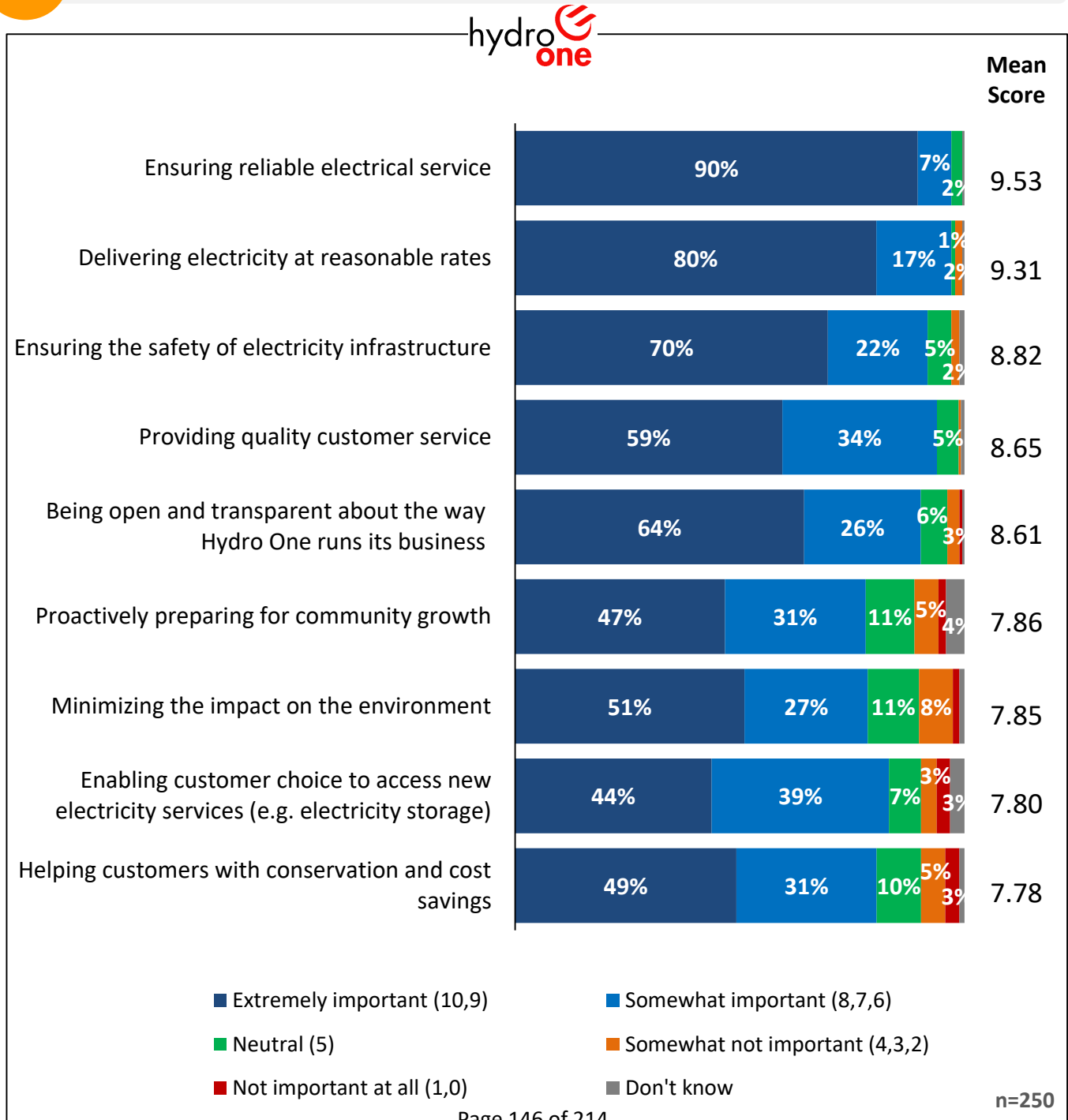
Commercial &amp; Industrial



Through previous customer research and contacts, a number of outcomes were identified by customers as priorities for Hydro One. We would like to check that list with you to ensure it is complete. We also want to understand the priorities you give to different outcomes.

Q

How important are each of the following Hydro One priorities to you as a customer?





## Outcome Priorities

Through previous customer research and contacts, a number of outcomes were identified by customers as priorities for Hydro One. We would like to check that list with you to ensure it is complete. We also want to understand the priorities you give to different outcomes.

Q

How important are each of the following Hydro One priorities to you as a customer?

BY Mean Score

	Total	Southern	Central	Eastern	Northern
Ensuring reliable electrical service	9.53	9.58	9.32	9.71	9.36
Delivering electricity at reasonable rates	9.31	9.44	8.93	9.49	9.12
Ensuring the safety of electricity infrastructure	8.82	9.05	8.61	8.83	8.40
Providing quality customer service	8.65	8.73	8.59	8.64	8.52
Being open and transparent about the way Hydro One runs its business	8.61	8.67	8.41	8.75	8.44
Proactively preparing for community growth	7.86	8.24	7.59	7.49	7.70
Minimizing the impact on the environment	7.85	7.78	8.39	7.44	8.04
Enabling customer choice to access new electricity services (e.g. electricity storage)	7.80	7.98	7.92	7.59	7.39
Helping customers with conservation and cost savings	7.78	7.65	8.10	7.81	7.68

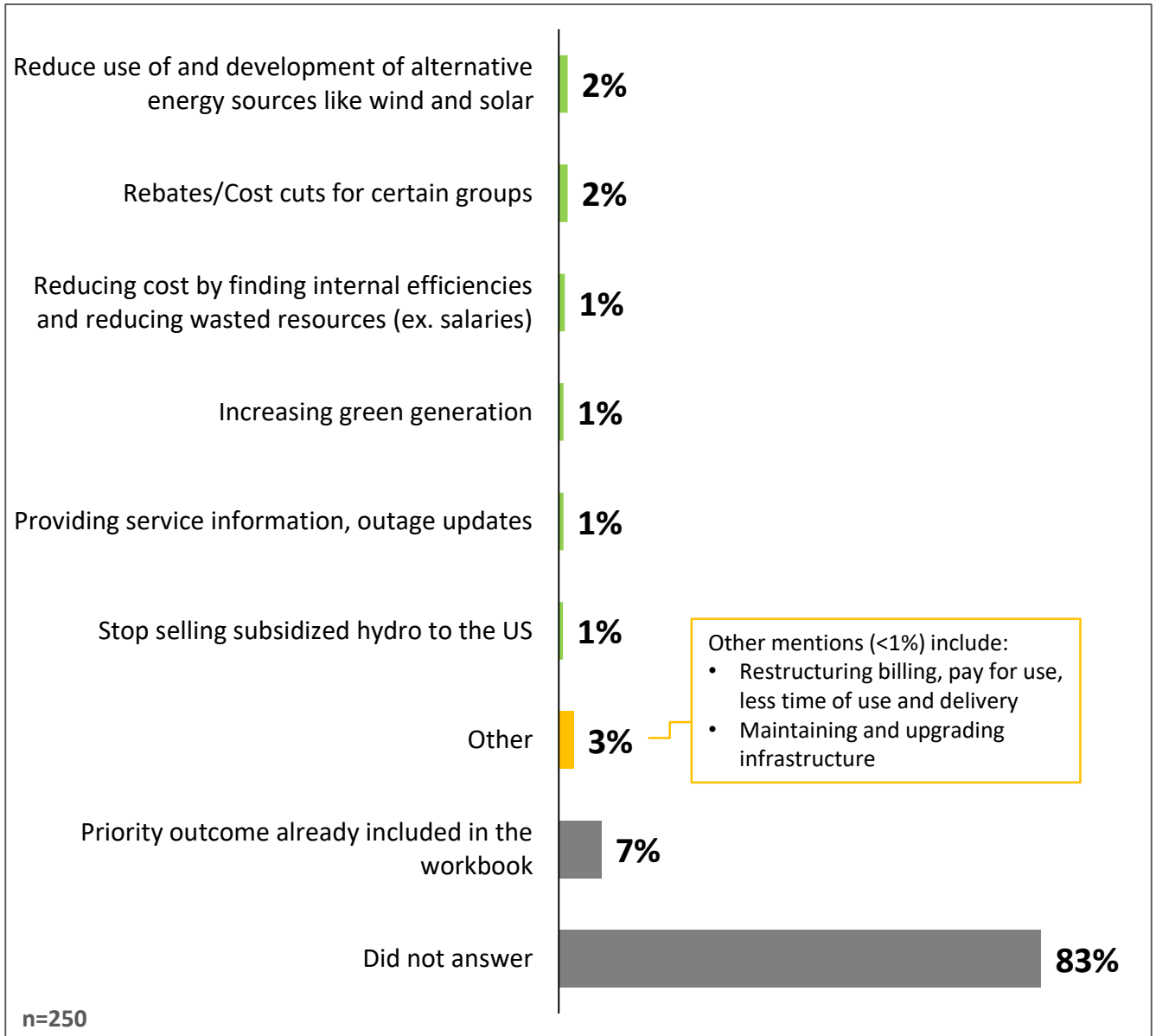


## Outcome Priorities

Through previous customer research and contacts, a number of outcomes were identified by customers as priorities for Hydro One. We would like to check that list with you to ensure it is complete. We also want to understand the priorities you give to different outcomes.



The list above may not include all the outcomes that matter to you. Are there any other important priorities that Hydro One should be focusing on that weren't included in the list above?

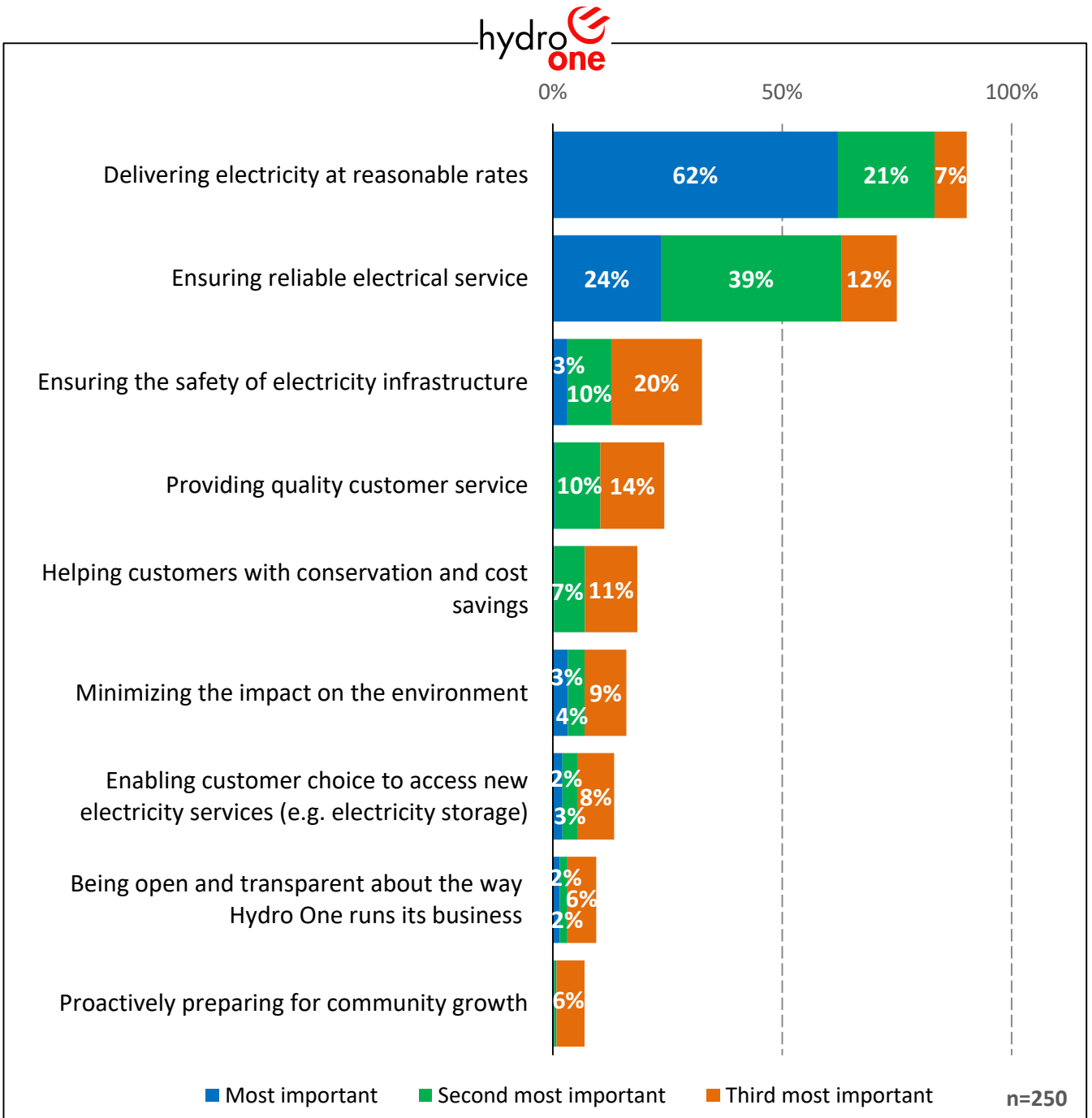


**Note:** 'None' (<1%) not shown.



## Outcome Priorities

**Q** Thinking again about the things Hydro One should be focusing on, please rank your top 3 priorities—where “1” would be the most important, “2” the second most important, and “3” the third most important.





Q

Now, let's talk about the reliability of electricity service you receive. Have you experienced any power outages at home in the past 12 months, which lasted longer than one minute? If so, approximately how many of these power outages did you experience?

	Total	Southern	Central	Eastern	Northern
No outages	14%	15%	10%	17%	12%
1 outage	12%	13%	12%	17%	4%
2 outages	20%	14%	29%	24%	20%
3 outages	14%	18%	7%	14%	16%
4 outages	9%	7%	12%	5%	16%
5 outages	3%	6%	-	2%	4%
6 outages	4%	4%	2%	2%	12%
7 outages	1%	1%	-	-	-
8 or more outages	7%	7%	5%	7%	8%
Don't know	16%	16%	22%	14%	8%



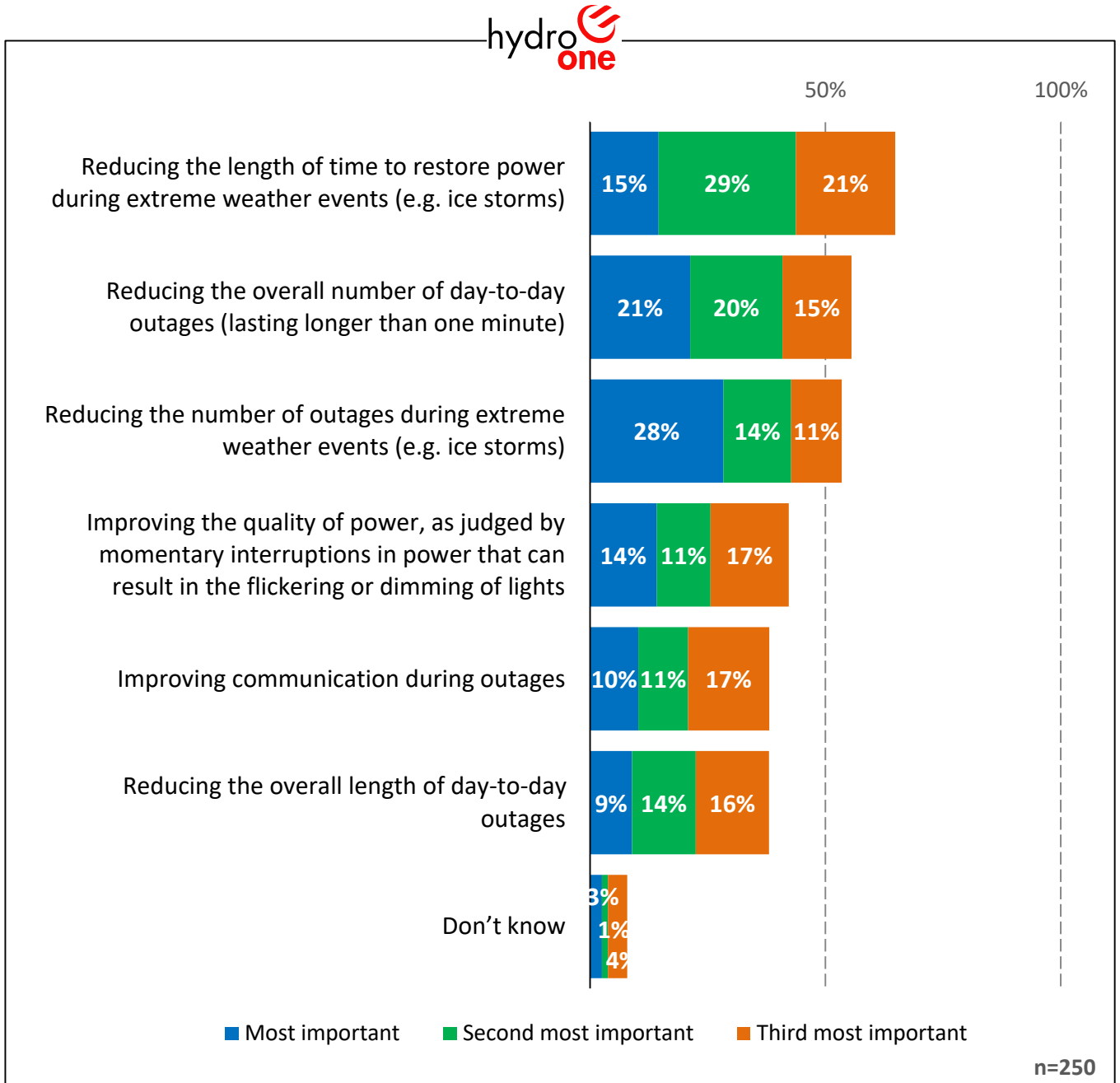


## Reliability Experience and Priorities

When it comes to reliability, there are a number of areas that Hydro One could focus on. For example, Hydro One could focus on improving day-to-day reliability and/or reducing interruptions during storms and other extreme weather.

Q

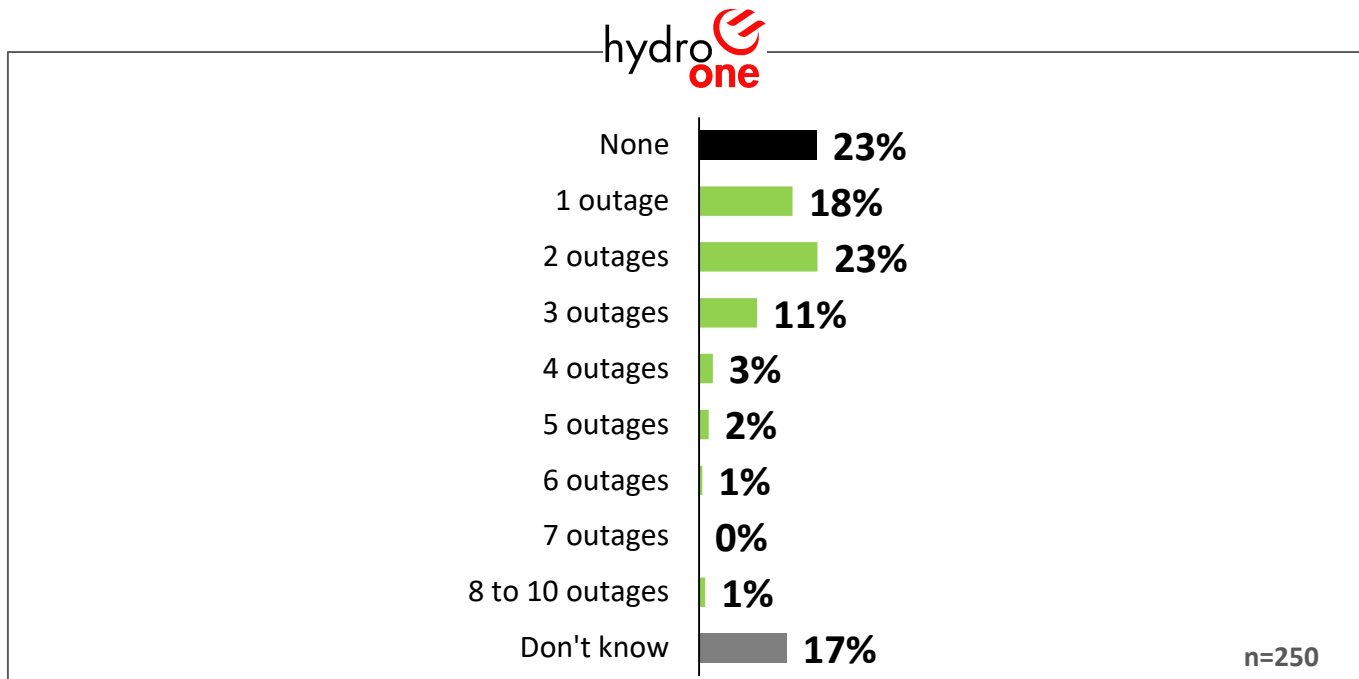
Among the following reliability outcomes, please rank your top 3 priorities—where “1” would be the most important, “2” the second most important, and “3” the third most important.





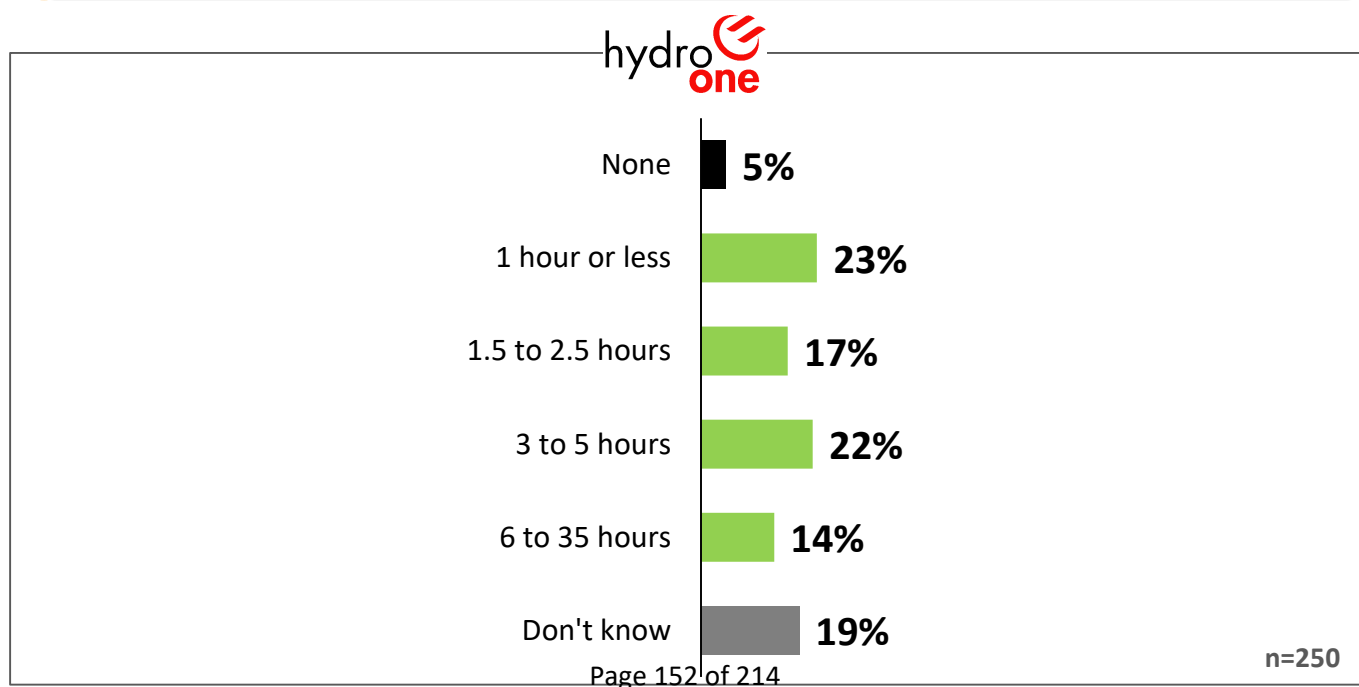
Q

What would you say is a reasonable number of outages that Hydro One customers should expect to experience every year?



Q

What would you say is a reasonable total length of outages that Hydro One customers should expect to experience every year?



Note: 'Refused' (<1%) not shown.



## Comparing Hydro One's Spending to Others

### Hydro One's Investment Plan

On a yearly basis, Hydro One's spending for the distribution side of the business is benchmarked by the OEB against other electricity distributors in Ontario.

Servicing more sparsely populated areas means that, compared to urban areas, more equipment (e.g. wooden poles, transformers and wires) is needed to serve the same number of customers.

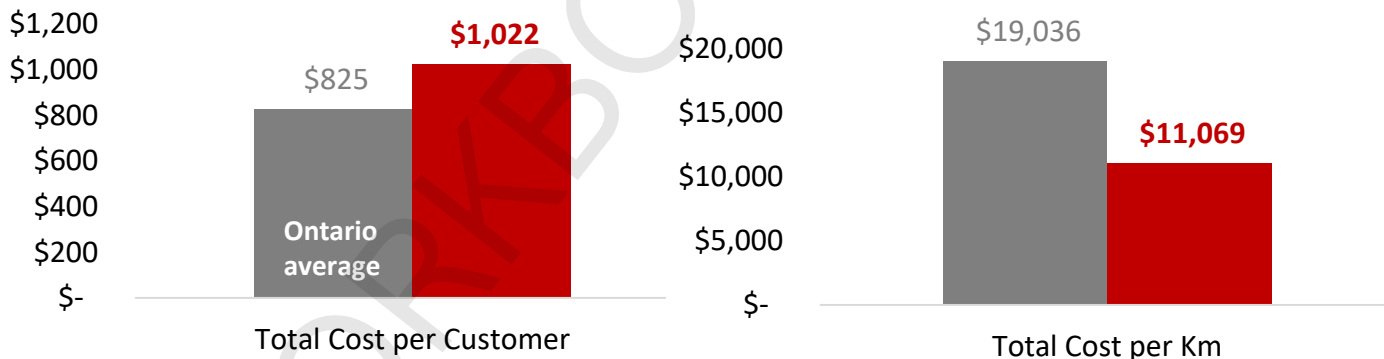
**On average, across Ontario 23 customers are served per kilometer of distribution line; in Hydro One's territory it is only 11 customers per kilometer.**

When we compare Hydro One to other electricity distributors, how well Hydro One compares depends on whether we look at cost per customer or cost per line km.

On a total cost per customer basis, it costs nearly \$200 more per customer for Hydro One to operate than the Ontario average. But when looking at the total cost per kilometer of distribution line, Hydro One's costs are \$8,000 below the Ontario average.

### Comparing Hydro One to Other Electricity Distributors (2018)

Source: 2018 OEB Benchmarking Report





## Comparing Hydro One's Spending to Others

**Benchmarking isn't the only way that Hydro One measures its operational efficiency.**

Like most businesses, Hydro One manages its spending in two budgets – a **capital budget** and an **operating budget**.

Its **capital budget** covers items that, once purchased, have lasting benefits over many years. This includes much of the equipment that is part of the distribution and transmission systems, such as poles, wires, cables, transformers, computers and information systems, vehicles and facilities.

**This phase of the engagement is focused on collecting your views on competing trade-offs in capital investments. These will be presented on the following pages.**

Hydro One's **operating budget** covers recurring expenses, such as the maintenance of equipment and the cost of customer service and billing.

In Hydro One's last rate application, the OEB limited the rate of Hydro One's annual operating cost increases by an amount that is less than inflation to incent the company to find ways of achieving the same outcomes for less money. Since 2015, Hydro One's operating costs have fallen by 4%.

The OEB runs an open and transparent review process where experts from the Ontario Energy Board (OEB) and intervenor groups review and challenge every dollar that Hydro One proposes to spend. Detailed discussion of Hydro One's operating budget is left to experts from the OEB and intervenors in the formal rate application review.

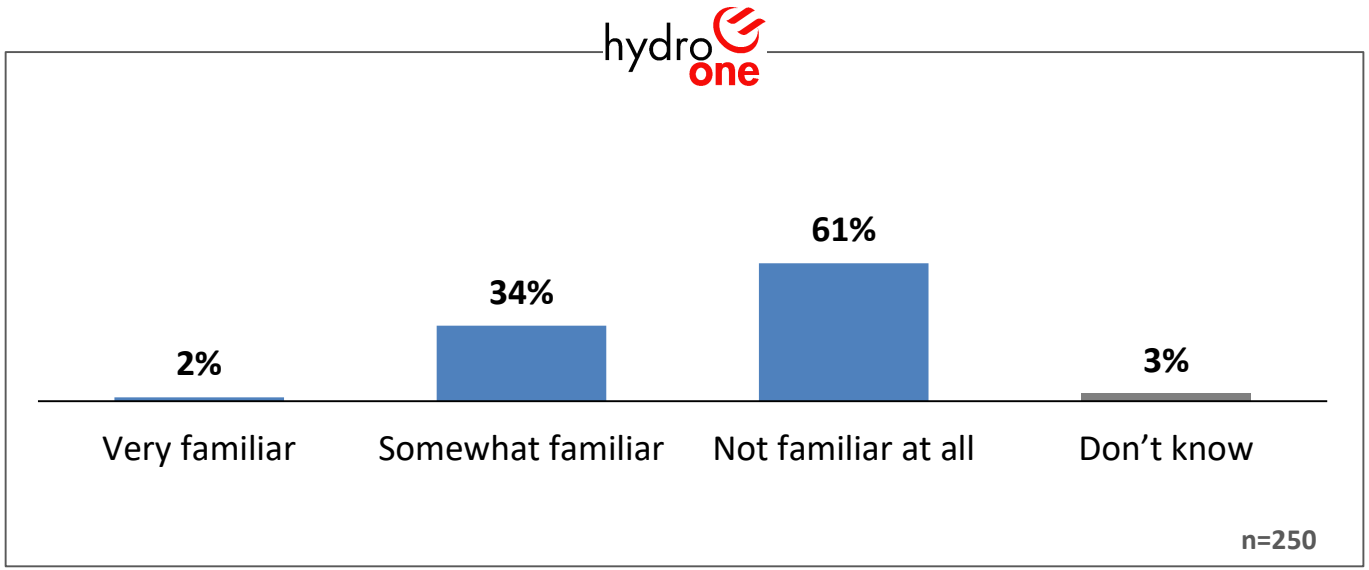
**Detailed questions about Hydro One's operating expenses will not be asked in this phase of the customer engagement.**

If you are interested in commenting on Hydro One's operating expenses, you are encouraged to participate in the OEB process when Hydro One files this application in 2021. Details will be available at that time at [oeb.ca/participate](http://oeb.ca/participate).



## Comparing Hydro One's Spending to Others

**Q** Before this survey, how familiar were you with the OEB review process and the requirement for Hydro One to find operating savings every year?



	Total	Southern	Central	Eastern	Northern
Very familiar	2%	3%	-	2%	-
Somewhat familiar	34%	35%	37%	31%	31%
Not familiar at all	61%	61%	61%	59%	65%
Don't know	3%	1%	2%	8%	4%



## Comparing Hydro One's Spending to Others

Q

Before this survey, how familiar were you with the OEB review process and the requirement for Hydro One to find operating savings every year?

### Additional Comments (n=11)

96% of respondents did not provide additional feedback

n-size

Make operation costs and comparisons with other providers available

4

General positive comments

2

Hydro One's varied demographic needs to be accounted for regarding service and billing

1

Inefficiencies in operation, especially salaries

1

Need more info / didn't understand survey / critical of survey

1

Other

1



Making Choices for Hydro One's Distribution System

**First, we would like to speak to you about Hydro One's distribution system.**

Most of Hydro One's distribution infrastructure (e.g. equipment like wooden poles, power transformers, and submarine cables) is now roughly 60 to 70 years old. Eventually, aging equipment deteriorates and has to be replaced to mitigate reliability, safety and environmental risks.



Hydro One has some control over when to make those investments.

Hydro One's **current approach** is to replace only the most critical aging equipment before it stops working. While Hydro One replaces aging equipment before it poses a safety, environmental or reliability risk, this still leaves 24% of station transformers and about 5% wooden poles currently in poor condition. Under Hydro One's current approach, the number of poles and station transformers in poor condition gets larger each year.

Hydro One's planners have identified **four options** for replacing aging equipment: Hydro One can continue its current level of investment, it can invest less, it can invest more to keep the percentage of aging equipment constant, or it can invest more to improve the percentage of aging equipment.

**Investing less** now would keep rate increases lower in the short term, but would lead to steeper rate increases in the future, as more equipment would need to be replaced later.

**Investing more** now, would mean higher rate increases now, but lower rate increases in the future, as Hydro One would replace more of its aging infrastructure now.

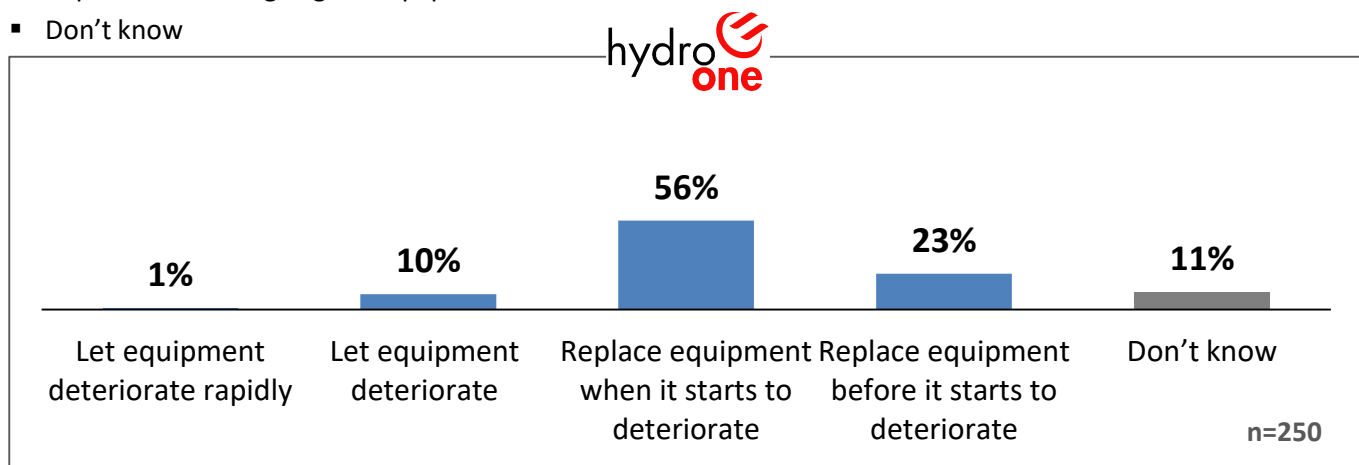


## Keeping Pace with Aging Distribution Infrastructure

Q

Which of the following statements best represents your point of view regarding Hydro One's approach to dealing with aging infrastructure?

- **Let Equipment Deteriorate Rapidly:** Hydro One should **decrease its current level of investment** in aging equipment to keep annual rate increases for new equipment [**about \$30 to \$40/under \$35/under \$110/under \$300**] on my organization's monthly bill, even if it means the share of aging equipment will grow rapidly and future rate increases will be very steep.
- **Let Equipment Deteriorate:** Hydro One should **maintain its current level of investment** in aging infrastructure to keep annual rate increases for new equipment [**about \$40 to \$60/between \$35 and \$55/between \$110 and \$165/ between \$300 and \$450**] on my organization's monthly bill, even if it means equipment will age faster than it is replaced (but less quickly than in the scenario above) and future rate increases will be steep.
- **Replace Equipment When It Starts to Deteriorate:** Hydro One should **increase its current level of investment** in aging infrastructure to keep annual rate increases for new equipment [**about \$65 to \$85/ between \$55 and \$85/between \$165 and \$250/between \$450 and \$700**] on my organization's monthly bill, to keep pace with aging equipment and enable smoother rate increases in the future.
- **Replace Equipment Before It Starts to Deteriorate:** Hydro One should **increase its current level of investment** in aging equipment to keep annual rate increases for new equipment [**about \$100/ between \$85 and \$120/between \$250 and \$350/between \$700 and \$1,000**] on my organization's monthly bill, which will improve the average age of equipment and enable stable rate increases in the future.
- Don't know



	Total	Southern	Central	Eastern	Northern
Let equipment deteriorate rapidly	1%	1%	2%	-	-
Let equipment deteriorate	10%	10%	5%	15%	8%
Replace equipment when it starts to deteriorate	56%	53%	61%	53%	65%
Replace equipment before it starts to deteriorate	23%	25%	24%	19%	19%
Don't know	11%	11%	7%	14%	8%





Q

Which of the following statements best represents your point of view regarding Hydro One's approach to dealing with aging infrastructure?

<b>Additional Comments (n=29)</b>	<b>n-size</b>
88% of respondents did not provide additional feedback	
Decrease operation costs, salaries/alternative financing etc.	5
Replace equipment after getting it's value, but before it becomes a problem	5
Be transparent and accountable with plans and spending	4
Consider cost	4
New underground lines / alternative materials for poles	3
Tech / equipment improvements	2
Preventative maintenance	1
Be proactive	1
Customers shouldn't pay more / extra for maintenance and upgrades	1
Other	2
None	1

# Online Workbook

## Ensuring Day-to-Day Reliability



### Making Choices for Hydro One's Distribution System

As previously mentioned, Hydro One's service territory is much larger and includes more rural areas than those of other electricity distributors in Ontario. Due to this geography, Hydro One's distribution system looks different than other distribution systems in Ontario.

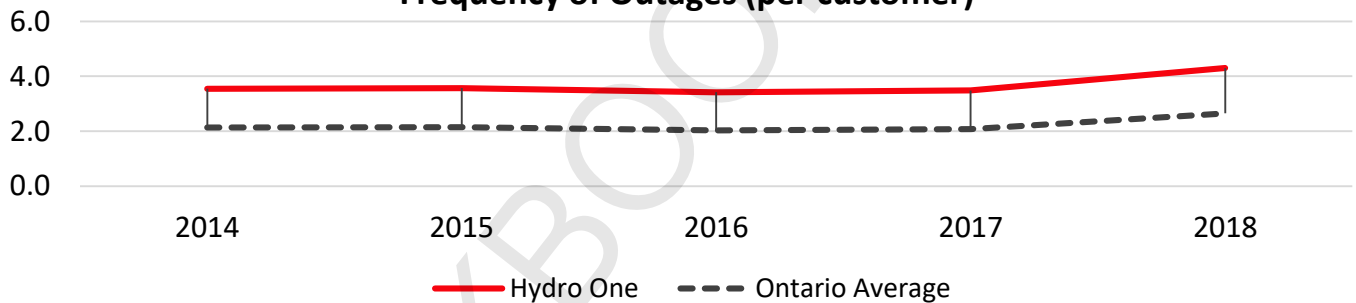
When Hydro One's system was first built, simple *radial lines* were constructed in rural areas. A radial line has only one power source for a group of customers. A power failure, short-circuit, or a downed power line interrupts power for all customers further down the line. While a *looped line* can restore power by bringing it in from another direction, power cannot be restored in a radial line until the source of the outage is found and repaired.

Compared to other local distribution companies, Hydro One now has more of those radial lines. They are less reliable than looped lines, which are standard in denser urban areas.

Hydro One tracks both the average number of power outages per customer and how long those outages last. The average Hydro One customer experiences more frequent and longer outages than the average Ontarian.

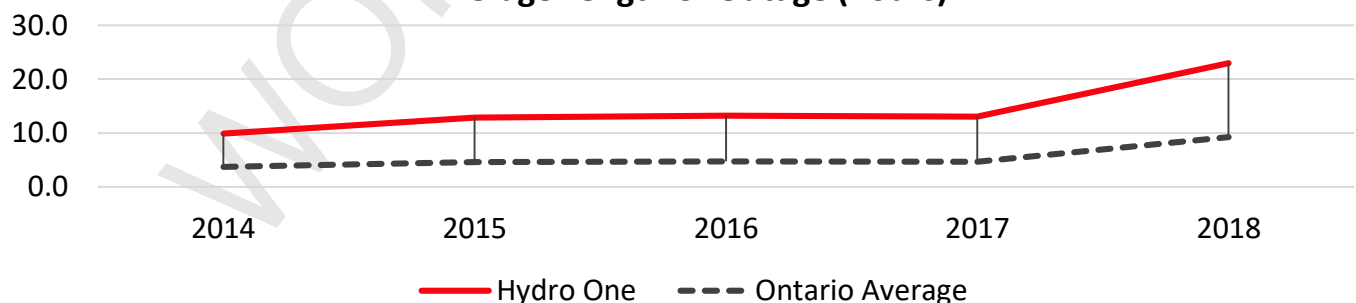
On average, between 2014 and 2018, the typical Hydro One customer has experienced 1.5 more outages per year compared to the Ontario average.

**Frequency of Outages (per customer)**



When it comes to total time spent without electricity each year, the typical Hydro One customer, since 2014, has been without power for 14.4 hours each year. That is 9 hours more than the Ontario average.

**Average Length of Outage (hours)**



There are investments that Hydro One can make to improve reliability, especially of radial lines, such as remote monitoring, remotely operable equipment and battery storage. While these investments are likely to reduce both the number and length of outages, they would add to the costs of the system.

# Online Workbook

## Ensuring Day-to-Day Reliability

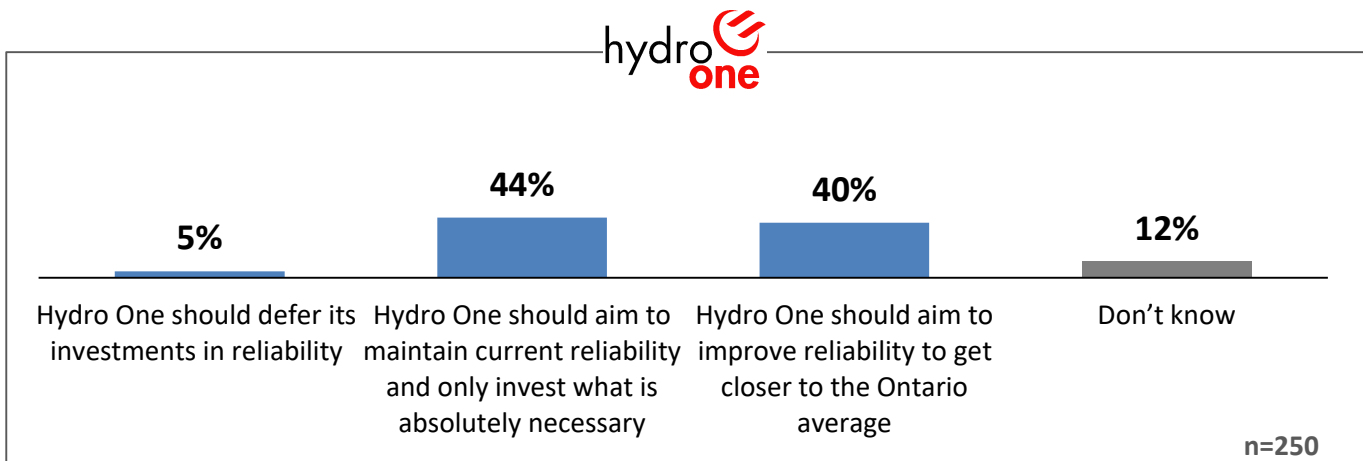
Commercial &amp; Industrial



Q

Which of the following statements best represents your point of view regarding Hydro One's approach to ensuring day-to-day reliability?

- Hydro One should defer its investments in reliability to keep costs down, even if this could lead to more or longer power outages in the future.
- Hydro One should aim to maintain current reliability and only invest what is absolutely necessary to maintain the current level of reliability, even if that increases my organization's monthly bill by **[about \$20 to \$35/ less than \$20/less than \$60/less than \$180]** each year.
- Hydro One should aim to improve reliability to get closer to the Ontario average, even if that increases my organization's monthly bill by **[about \$50 to \$65/less than \$60/less than \$180/less than \$500]** each year.
- Don't know



	Total	Southern	Central	Eastern	Northern
Hydro One should defer its investments in reliability	5%	7%	2%	2%	8%
Hydro One should aim to maintain current reliability and only invest what is absolutely necessary	44%	42%	37%	44%	58%
Hydro One should aim to improve reliability to get closer to the Ontario average	40%	40%	46%	39%	31%
Don't know	12%	11%	15%	15%	4%



Q

Which of the following statements best represents your point of view regarding Hydro One's approach to ensuring day-to-day reliability?

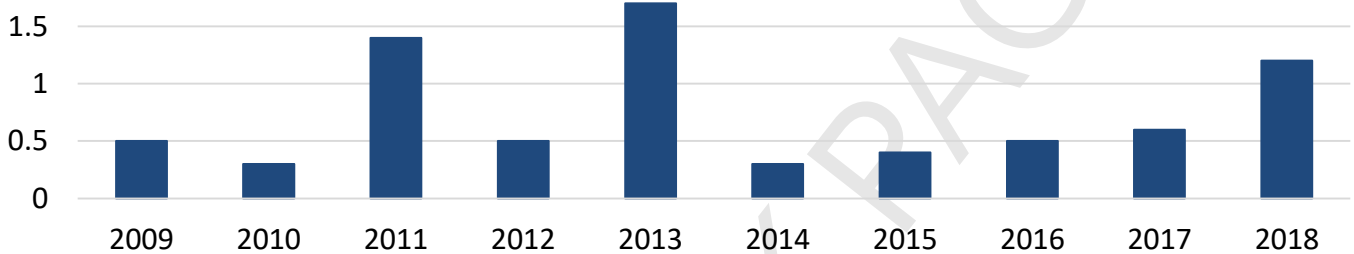
<b>Additional Comments (n=24)</b>	<b>n-size</b>
90% of respondents did not provide additional feedback	
Leading questionnaire/only seeking to raise bills	4
Find internal efficiencies/reduce operating costs/salaries	3
Poor planning/maintenance should have been ongoing/where has the money gone	2
Look into alternative/green energy sources	2
Reduce cost/no increases/keep increases minimal	2
Be proactive/will only cost more in future	2
Use profits/customers should not pay	2
Investment/improvements necessary	1
Protect/strengthen infrastructure/bury lines	1
Reliability/safety over cost	1
Differentiate service/billing between urban and rural customers	1
Other	3
Refused	1



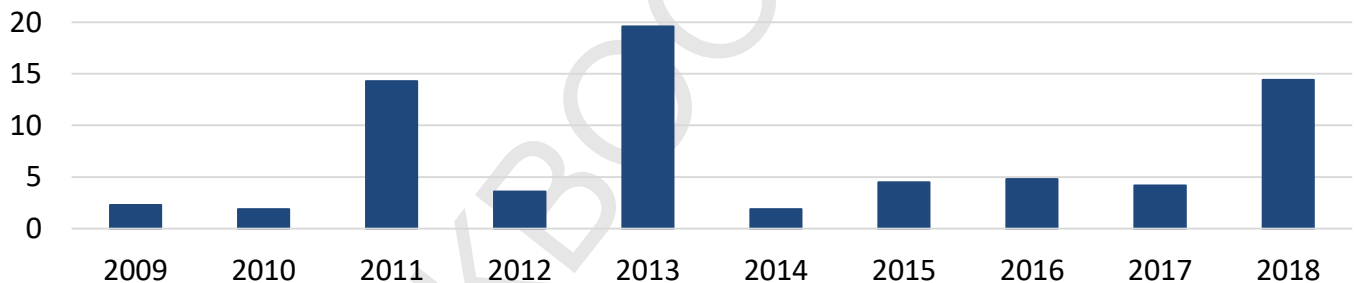
### Making Choices for Hydro One's Distribution System

Over the past ten years, severe weather, such as ice storms, windstorms or thunderstorms, has caused multiple outages that tended to last longer than regular day-to-day outages. In 2018, the average Hydro One customer was without power for an average total of 7 hours due to day-to-day outages. When the effect of storms are included, the total average duration was 23 hours for the average Hydro One customer.

#### Frequency of Outages (per customer) Caused by Severe Weather



#### Average Duration of Outages (hours) Caused by Severe Weather



The occurrence and severity of weather events are largely unpredictable. The number and duration of outages caused by severe weather have varied year-by-year.

Currently, Hydro One does not have a designated program to focus on minimizing the impacts of severe weather. However, there are investments Hydro One could make to make the system more resilient to help mitigate the potential impacts of severe weather. These types of investments could include building infrastructure to a higher, more redundant standard.

Any investments Hydro One would make would be based on previous experience and estimates of future major events. However, because major events are unpredictable, these investments may not match the events Hydro One actually experiences.

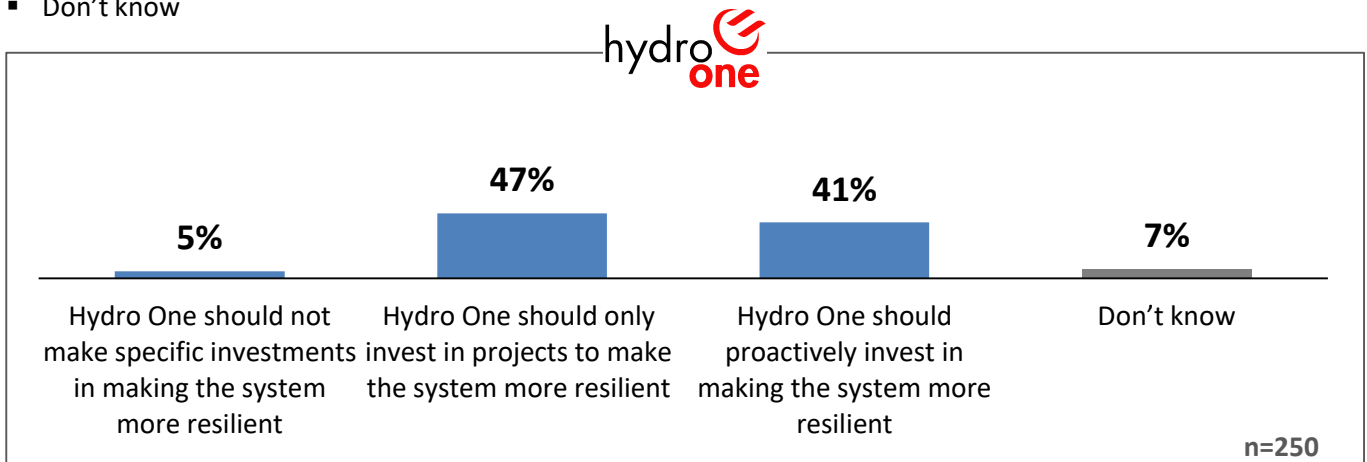
# Online Workbook

## Responding to Severe Weather



Q Which of the following statements best represents your point of view?

- In order to keep rates down, Hydro One should not make specific investments in making the system more resilient to severe weather, even if that means no improvements or potential increases in the length and number of outages caused by severe weather.
- Hydro One should only invest in projects to make the system more resilient to severe weather as part of the ongoing replacement of old or failing equipment, but not more, even if that increases my organization's monthly bill by [about \$2 to \$8/less than \$5/less than \$15/less than \$40] each year.
- Hydro One should proactively invest in making the system more resilient in order to reduce the length and number of outages caused by severe weather, even if that increases my organization's monthly bill by [about \$13 to \$17/less than \$30/less than \$100/less than \$300] each year.
- Don't know



	Total	Southern	Central	Eastern	Northern
Hydro One should <u>not</u> make specific investments in making the system more resilient	5%	6%	-	5%	12%
Hydro One should only invest in projects to make the system more resilient	47%	51%	37%	47%	50%
Hydro One should proactively invest in making the system more resilient	41%	37%	56%	37%	35%
Don't know	7%	6%	7%	10%	4%

# Online Workbook

## Responding to Severe Weather



Q Which of the following statements best represents your point of view?

<b>Additional Comments (n=19)</b>	<b>n-size</b>
92% of respondents did not provide additional feedback	
Protect and strengthen infrastructure, especially burying lines	3
Survey is leading, just about raising bills, otherwise critical of survey	3
Alternative, green energy sources	2
Find efficiencies to reduce cost in operations, especially salaries	2
Reduce cost for customer	1
Replace things before they cause problems	1
Incentivize customers adopting generation, conservation methods	1
Perform preventative maintenance	1
Consider climate change, more severe weather, environment	1
Upgrade infrastructure when it needs to be replaced	1
Other	2
Don't know	1

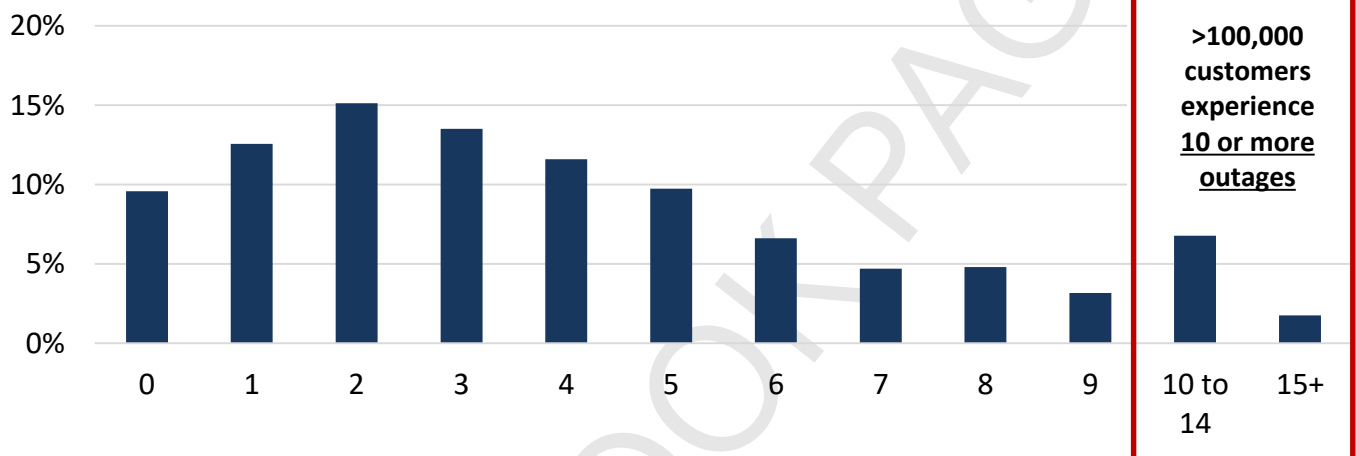


### Making Choices for Hydro One's Distribution System

Hydro One customers experience different levels of reliability, depending on where they live, equipment and the historical legacy of when the system was built.

While some Hydro One customers didn't experience any outages in 2017 or 2018, others were without power more than 15 times per year. Similarly, the total length of time that customers were without power ranged from less than one hour to more than 50 hours per year.

### Average Number of Outages Per Customer (2018)



There are investments Hydro One can make to bring customers experiencing poor reliability closer to the system average. This includes modernizing certain distribution lines by adding remote monitoring, switches to detect and isolate the cause of a power interruption, and batteries to minimize the impact on customers.

#### There are two ways Hydro One can fund improvements for these customers:

- Hydro One can shift spending away from circuits that experience average or better reliability to those with poor reliability. That will mean customers on circuits with average or better reliability will likely experience small declines in reliability, while customers with the worst reliability will see significant improvements.
- Hydro One can increase spending to provide additional resources for customers with the worst reliability and keep spending the same on circuit with average or better reliability. With this approach, no customer will be worse off, while customers with the worst reliability will see significant improvements.

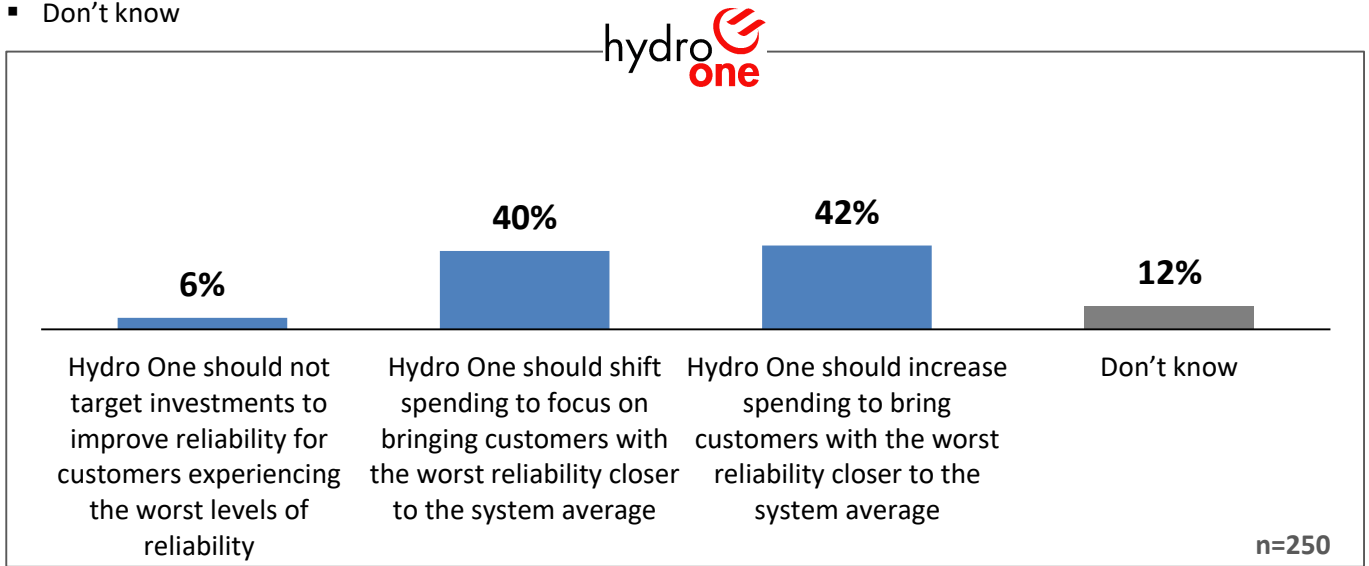




## Helping Customers with Poor Reliability

**Q** Which of the following statements best represents your point of view?

- Hydro One should not target investments to improve reliability for customers experiencing the worst levels of reliability in order to keep costs down, even if that leaves some with worse reliability than others.
- Hydro One should shift spending to focus on bringing customers with the worst reliability closer to the system average without raising prices, even if that means that reliability may go down for customers whose reliability is currently average or above.
- Hydro One should increase spending to bring customers with the worst reliability closer to the system average, even if that increases my organization’s monthly bill by [about \$6 to \$8/under \$10/less than \$30/less than \$100] each year.
- Don't know



	Total	Southern	Central	Eastern	Northern
Hydro One should <u>not</u> target investments to improve reliability for customers experiencing the worst levels of reliability	6%	5%	5%	7%	8%
Hydro One should shift spending to focus on bringing customers with the worst reliability closer to the system average	40%	41%	44%	37%	35%
Hydro One should increase spending to bring customers with the worst reliability closer to the system average	42%	40%	41%	46%	46%
Don't know	12%	14%	10%	10%	12%

**Note:** Change in price is shown as price change for [GSd/ST low/ST medium/ST high].



Q Which of the following statements best represents your point of view?

Additional Comments (n=10) 96% of respondents did not provide additional feedback	n-size
Hydro One should pay- make cuts from within	3
Issues with survey / need more information	3
Reliability is critical and should be equal for all customers	2
Keep rates low - stop increasing	1
Other	1
Refused	1

### Making Choices for Hydro One's Distribution System

One of the issues that Hydro One planners face is whether to continue building out the distribution system in areas where economic development is expected to lead to future growth. Certain pockets across Ontario are experiencing regional growth and economic development, which leads to the need for greater investments in infrastructure to meet the demand for electricity.

Currently, in order to keep rates low, Hydro One **reactively increases the capacity of its system** to address community and economic growth. That means Hydro One only adds new capacity to its system when there are firm expectations of new demand and most of the costs to expand are borne by the connecting customers.

Some communities have expressed concern that, with this approach, it is difficult to attract new businesses to their community. For instance, not all communities currently have access to the level of power needed to grow and attract new businesses. While the level of power required to service a home is available across Hydro One's service territory, some businesses, including gas stations, grocery stores, and motels, require a greater electrical capacity to operate.

To help regional and economic development, Hydro One could take on a more **proactive role** and make the investments necessary to increase the capacity needed to supply communities where future growth is projected. If Hydro One responds to these communities and builds that capacity, all Hydro One customers will share the cost of adding this infrastructure, particularly if no businesses come. Communities say that attracting new business will increase demand and that will spread the costs out.

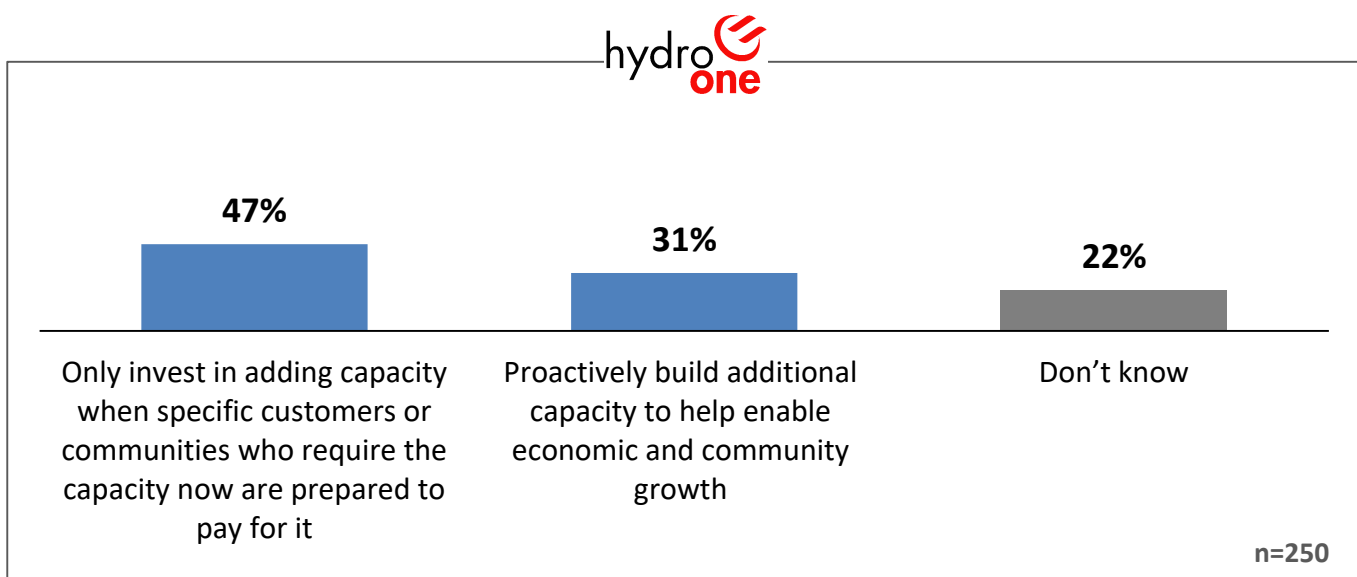
The question is whether customers would like Hydro One to promote or react to economic growth in the communities it operates in.





Q Which of the following statements best represents your point of view?

- Hydro One should only invest in adding capacity when specific customers or communities who require the capacity now are prepared to pay for it.
- Where a local community asks for it, Hydro One should proactively build additional capacity to help enable economic and community growth based on a forecast of the area's future requirements, even if these investments increase my organization's monthly bill by [about \$20 to \$25/less than \$35/less than \$100/less than \$300] each year.
- Don't know



	Total	Southern	Central	Eastern	Northern
Only invest in adding capacity when specific customers or communities who require the capacity now are prepared to pay for it	47%	45%	41%	54%	46%
Proactively build additional capacity to help enable economic and community growth	31%	34%	32%	31%	23%
Don't know	22%	21%	27%	15%	31%



Q Which of the following statements best represents your point of view?

<b>Additional Comments (n=14)</b> 94% of respondents did not provide additional feedback	<b>n-size</b>
Developers / communities requiring services should pay	5
Keep rates down	3
Hydro One should pay- make cuts from within	2
Businesses requiring service should pay	1
Good planning and working with communities	1
Critical of question/survey	1
Other	1



## Keeping Hydro One's Business Running

### Making Choices for Hydro One's Distribution System

Hydro One is more than just poles and wires – it's a business that needs to invest in equipment such as tools, trucks, buildings, computers and software.

When deciding whether to continue to maintain existing equipment or replace them, Hydro One considers whether the risks and costs of continuing to use it outweigh the benefits of waiting longer to replace it. Delaying investments may make it harder for staff to do their jobs safely and maintain reliability and security standards.

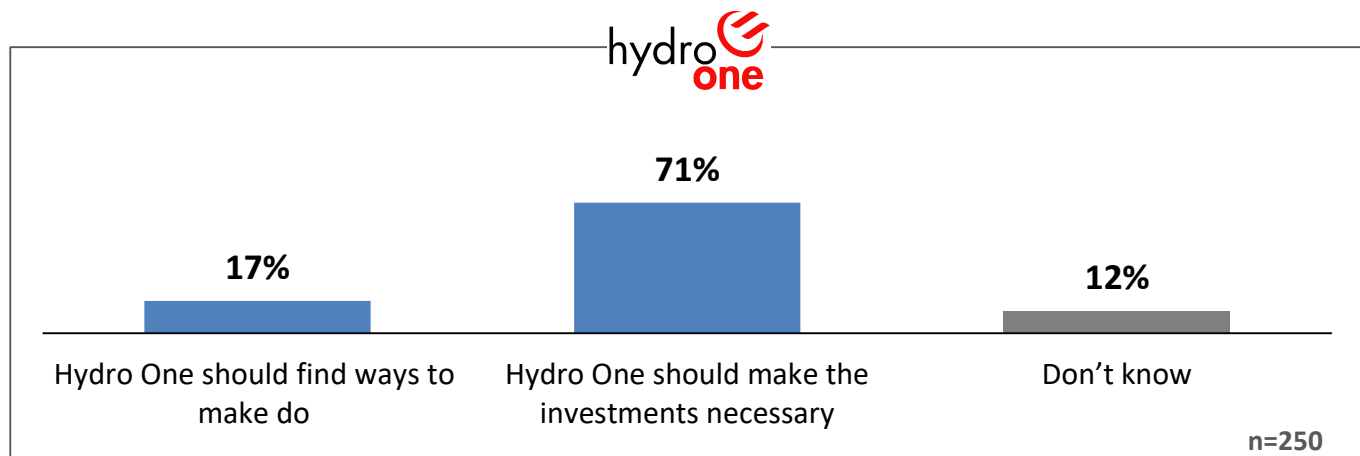




## Keeping Hydro One's Business Running

Q Which of the following statements best represents your point of view?

- Hydro One's should find ways to make do with the facilities, equipment, vehicles and IT and computer systems it already has and only replace the equipment with the most urgent needs, even if that means increasing risk to safety, reliability, and security.
- Hydro One's should make the investments necessary to ensure its staff will have access to equipment of the same standard as similar sized businesses.
- Don't know



	Total	Southern	Central	Eastern	Northern
Hydro One should find ways to make do	17%	16%	20%	17%	19%
Hydro One should make the investments necessary	71%	72%	73%	69%	65%
Don't know	12%	12%	7%	14%	15%



**Q** Which of the following statements best represents your point of view?

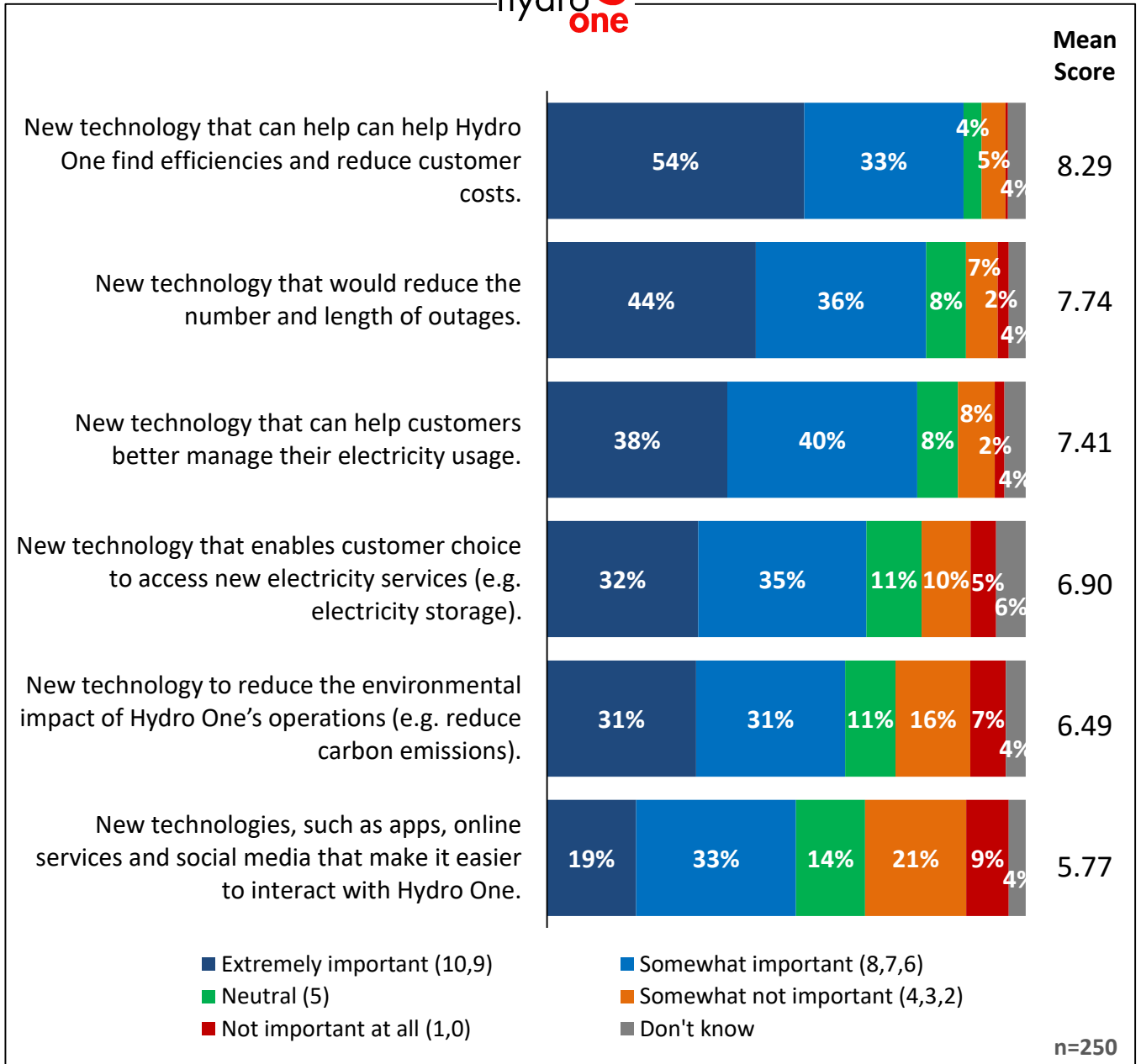
<b>Additional Comments (n=22)</b>	<b>n-size</b>
91% of respondents did not provide additional feedback	
Find efficiencies in operation cost, especially salaries	5
Survey is leading, not giving enough options, biased	4
Invest prudently, only in most necessary equipment	3
Investment should come from profits, not increase to customer	2
Lower cost for consumer	2
Keep tech and equipment up to date, prioritize service	1
Workers need safe, reliable equipment	1
Compromise between options	1
Other	3





Another investment category is related to new technology that Hydro One could invest in to address a range of issues. These include reliability, efficiency, customer service, Hydro One’s impact on the environment, new service offerings and tools to manage electricity usage.

**Q** How important are each of the following investments in new technology that Hydro One could focus on?



# Online Workbook

## Investing in New Technology



Another investment category is related to new technology that Hydro One could invest in to address a range of issues. These include reliability, efficiency, customer service, Hydro One's impact on the environment, new service offerings and tools to manage electricity usage.

Q

How important are each of the following investments in new technology that Hydro One could focus on? BY **Mean Score**

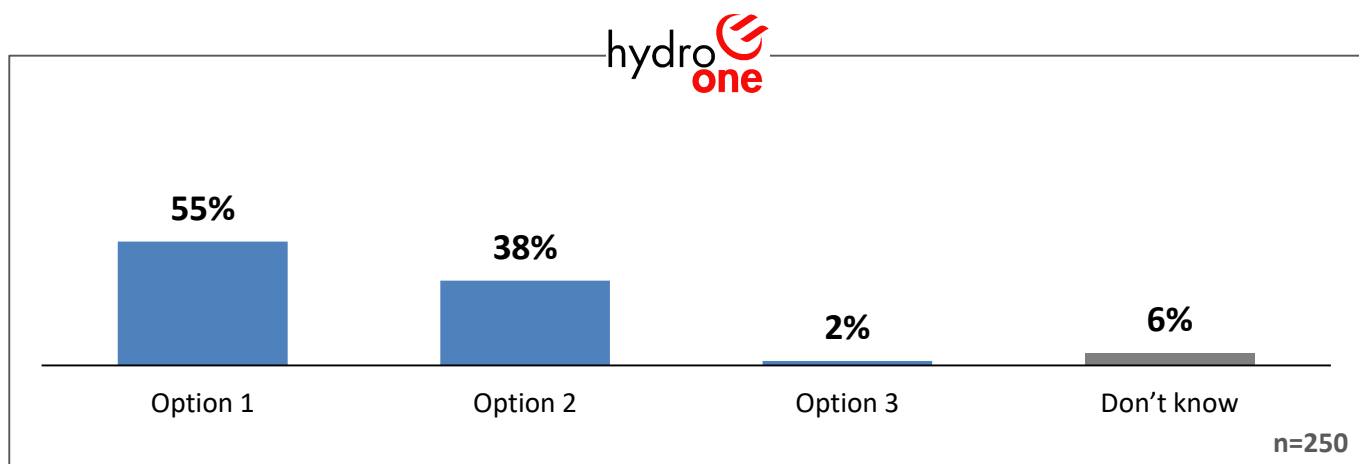
	Total	Southern	Central	Eastern	Northern
New technology that can help can help Hydro One find efficiencies and reduce customer costs.	8.29	8.24	8.10	8.58	8.21
New technology that would reduce the number and length of outages.	7.74	7.77	7.82	7.95	7.13
New technology that can help customers better manage their electricity usage.	7.41	7.18	7.82	7.36	7.67
New technology that enables customer choice to access new electricity services (e.g. electricity storage).	6.90	6.69	7.21	6.89	7.13
New technology to reduce the environmental impact of Hydro One's operations (e.g. reduce carbon emissions).	6.49	6.17	7.08	6.45	6.79
New technologies, such as apps, online services and social media that make it easier to interact with Hydro One.	5.77	5.75	5.85	5.68	5.88



Q

Which of the following statements best represents your point of view when it comes to investing in new technologies?

- **Option 1:** Hydro One should only invest in new technologies if there is clear evidence that these technologies will lead to positive outcomes.
- **Option 2:** Hydro One should pursue Option 1 and also invest in pilot projects for new technologies where the company sees a good chance that it would lead to positive outcomes.
- **Option 3:** Hydro One should not invest in these new technologies.
- Don't know



	Total	Southern	Central	Eastern	Northern
Option 1	55%	53%	44%	69%	50%
Option 2	38%	39%	46%	27%	38%
Option 3	2%	2%	2%	-	4%
Don't know	6%	5%	7%	3%	8%



Which of the following statements best represents your point of view when it comes to investing in new technologies?

<b>Additional Comments (n=6)</b> 97% of respondents did not provide additional feedback	<b>n-size</b>
Only make investments that are proven to work and improve service	3
Money for investment should come from profits, not increased bills	1
Make investments that are proven to reduce customer bills	1
Critical of survey or question/need more info	1

# Large Distribution Accounts Online Workbook Results





### Field Dates & Workbook Delivery

The **LDA Online Workbook** was sent to all Hydro One Large Distribution Customers. Customers had an opportunity to complete the workbook between January 23<sup>rd</sup> and February 11<sup>th</sup>, 2020.

Each customer received a workbook customised to their rate class using a unique URL that could be linked back to their annual consumption, region and rate class.

In total, the LDA workbook was sent to all **132** customers via e-blast from Hydro One.

### Commercial and Industrial Online Workbook Completes

A total of 10 (unweighted) Hydro One LDA customers completed the online workbook via a unique URL.

### Sample Weighting

The online workbook sample was not weighted due to the small number of completes. The results should be interpreted with caution, given the small number of completes.



### Welcome to Hydro One's Customer Engagement!

**Hydro One needs your input on choices that will impact the services you receive and the rates that you pay.**

- **Hydro One** is developing its investment plan for 2023 to 2027. This plan will determine the investments Hydro One will make in equipment and infrastructure, the services it provides, and the rates you pay.
- As **Hydro One** plans for the future, they must ensure their business decisions are aligned with customer priorities, preferences, and needs.
- **Hydro One** will be accountable to the public regulator, the Ontario Energy Board (OEB), both in terms of sharing what customers say and demonstrating how they considered those views.
- **You don't need to be an electricity expert** to participate in this engagement. This workbook is focused on basic choices and provides the background information you need to answer the questions.
- This customer engagement will take approximately 20-30 minutes to complete, depending on the level of feedback you wish to provide. Your progress will be saved as you move through the workbook, meaning you can leave and return to the customer engagement at any time.

**All individual responses will be kept confidential.** Innovative Research Group (INNOVATIVE), an independent research company, has been hired to gather your feedback.

**Those who complete the questions that follow will be invited to enter a draw to win an office lunch valued at \$500.**

If you are reading this on a smaller mobile device, you may want to consider accessing the survey from a tablet, desktop or laptop instead so that it is easier for you to read.



### Hydro One's Role in Ontario's Electricity System

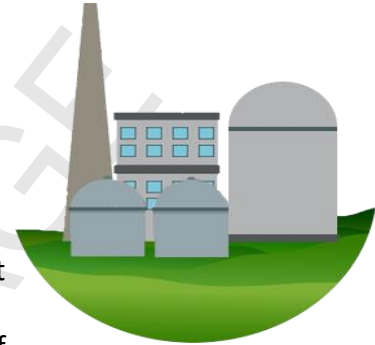
Ontario's electricity system is owned and operated by public, private, and municipal corporations across the province. It is made up of three key components: **generation**, **transmission** and **distribution**. Hydro One is involved in both electricity transmission across Ontario and distribution in many communities.

#### Generation

##### Where electricity comes from.

Ontario gets its electricity from a mix of energy sources. About half comes from nuclear power. The remainder comes from a mix of hydroelectric and natural gas, and to a lesser extent, wind and solar.

Ontario Power Generation, a government-owned company, generates almost half of Ontario's electricity. The other half comes from multiple generators who have contracts with the grid operator to provide power from a variety of sources.

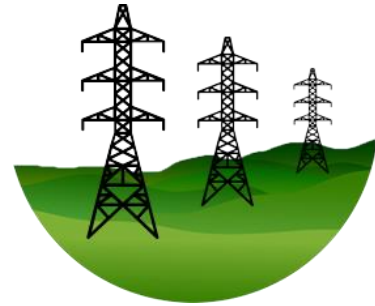


#### Transmission

##### Electricity travels across Ontario.

Once electricity is generated, it must be transported to urban and rural areas across the province. This happens by way of high voltage transmission lines that serve as highways for electricity. Often these lines are suspended on large, steel lattice towers. The province has more than 30,000 km of transmission lines, and almost all are owned by Hydro One.

Hydro One provides transmission services to most electricity customers in Ontario.

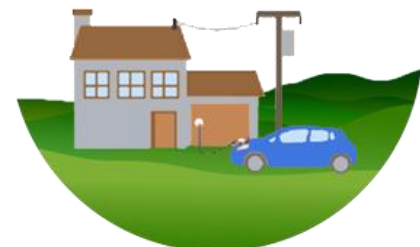
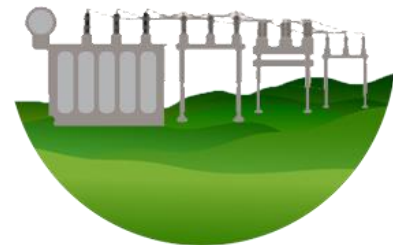


#### Local Distribution

##### Delivering power to homes and businesses in your community.

In many communities, Hydro One is also responsible for the last step of the journey: delivering electricity to customers through its distribution system. This local distribution system includes transformer stations that decrease the voltage of the electricity so it can be used safely in your home or business.

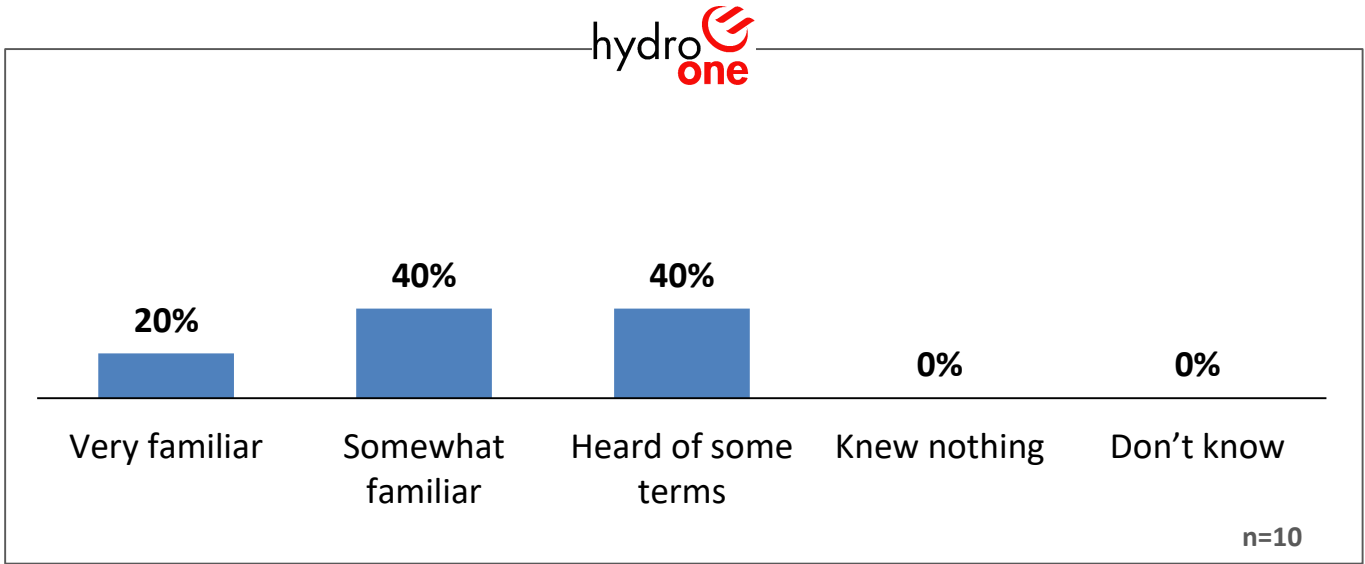
While there are many distributors across Ontario, Hydro One builds, operates and maintains this distribution system that serves you. Hydro One reads meters, calculates and collects bills for all parts of the electricity system and answers customer calls.







**Q** Before this survey, how familiar were you with the various parts of the electricity system and how they work together?



Note: Interpret values with caution, as sample size is very small.



## Who is Hydro One?

### Electricity 101

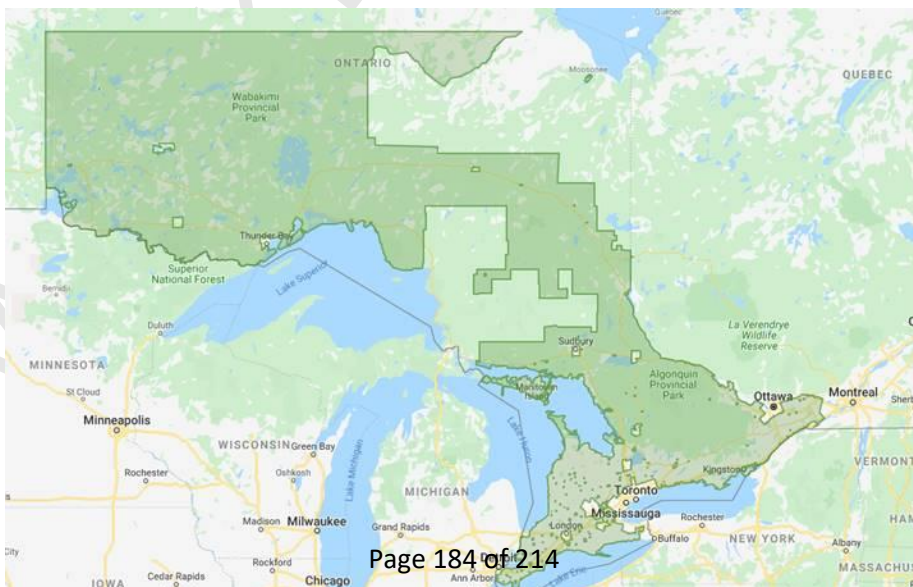
- Hydro One is Ontario's largest electricity transmission and distribution service provider.
- Hydro One is a publicly traded corporation. Its largest shareholder is the Government of Ontario.
- Hydro One is regulated by the Ontario Energy Board (OEB) and must apply to the OEB for approval of the amount it charges for its services.

### Hydro One's Transmission System

- Hydro One's transmission system takes electricity from generators (i.e. the Adam Beck facility at Niagara Falls or the Bruce Power nuclear power plant) and transports it via high-voltage transmission lines to local communities, where the voltage is lowered ("stepped-down") so you can use it in your home or business.
- Hydro One's transmission system serves 98% of electricity customers in Ontario.

### Hydro One's Distribution System

- Hydro One is also required by law to distribute electricity across Ontario to any customer not otherwise served by a local distribution company. This means that Hydro One's nearly 1.4 million customers are predominantly rural customers.
- Hydro One's local distribution system, which brings electricity to your home through a network of wires, poles and other equipment, covers approximately 75% of the geographic area of Ontario.
- Compared to other electricity distributors in the province, Hydro One's service territory is much larger and includes more rural and remote areas.

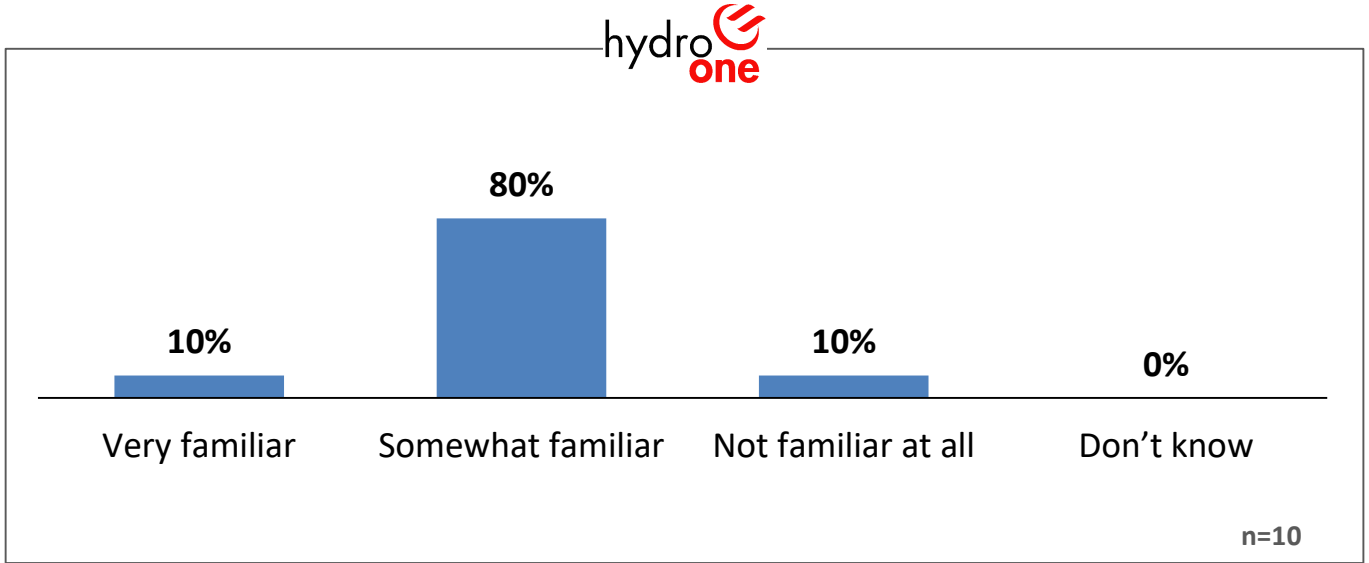




## Who is Hydro One?



How familiar are you with Hydro One, which operates the transmission system across the province and the electricity distribution system in your community?



Note: Interpret values with caution, as sample size is very small.

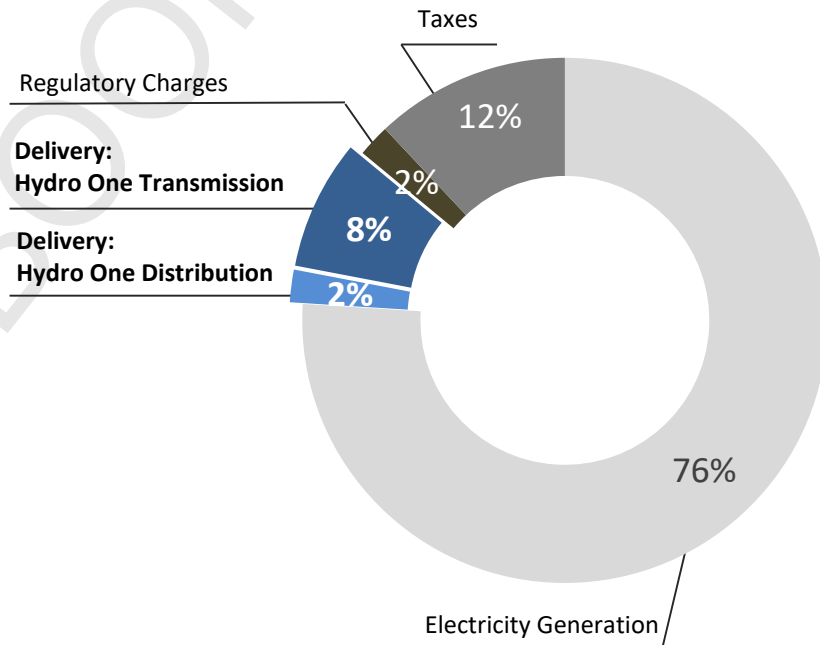


## How much of my bill goes to Hydro One?

### Electricity 101

- Every item and charge on your organization's bill is mandated by the provincial government or regulated by the Ontario Energy Board (OEB), the provincial energy regulator.
- While Hydro One is responsible for collecting payment for the entire electricity bill, it only keeps about 10% or \$24,714.03 of the average sub-transmission customer's bill with a similar consumption as your organization.
- This amount is split into 2% (\$5,362.82) for distribution, and 8% for transmission (\$19,351.21).
- The rest of the bill goes to power generation companies, taxes, and regulatory agencies.
- The calculations in this workbook are based on a typical monthly usage of 1,601,036 kWh. However, your organization's consumption may vary.

**Breakdown of Monthly Bill**



### Hydro One Sample Monthly Bill

(Based on monthly usage of 1,601,036 kWh)

Account Number:  
000 000 000 000 0000

Meter Number:  
00000000

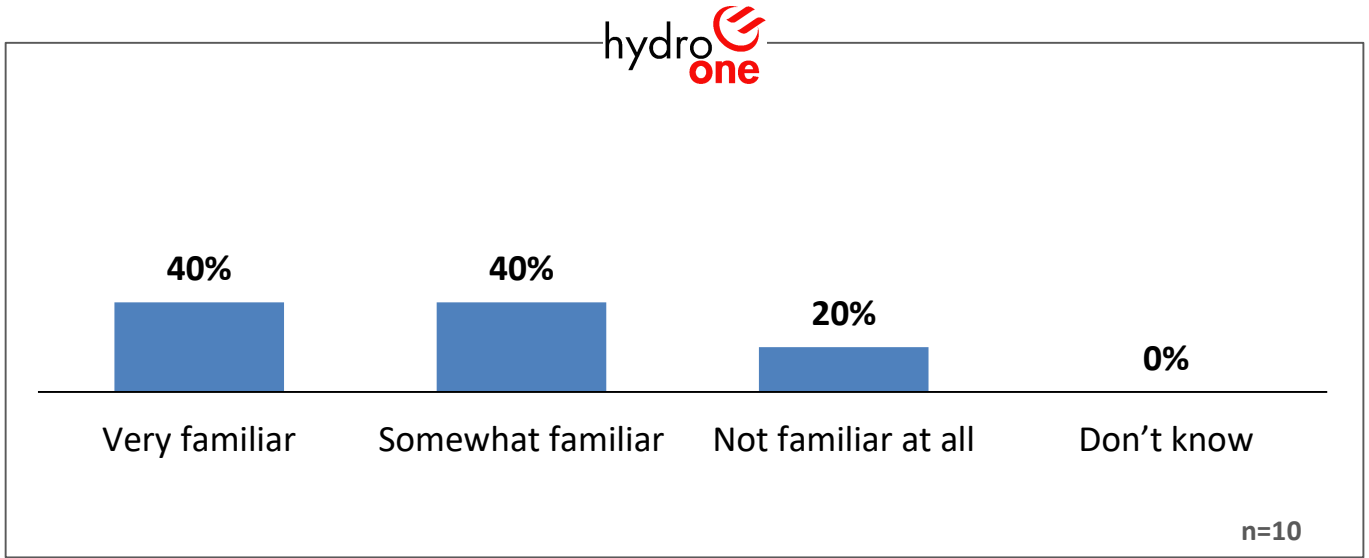
#### Your Electricity Charges

Electricity	191,206.93
Delivery	24,714.03
Regulatory Charges	6,456.59
<b>Total Electricity Charges</b>	<b>\$222,377.54</b>
HST	28,909.08
<b>Total Amount</b>	<b>\$251,286.62</b>



## How much of my bill goes to Hydro One?

**Q** Before this survey, how familiar were you with the amount of your organization's electricity bill that went to Hydro One?



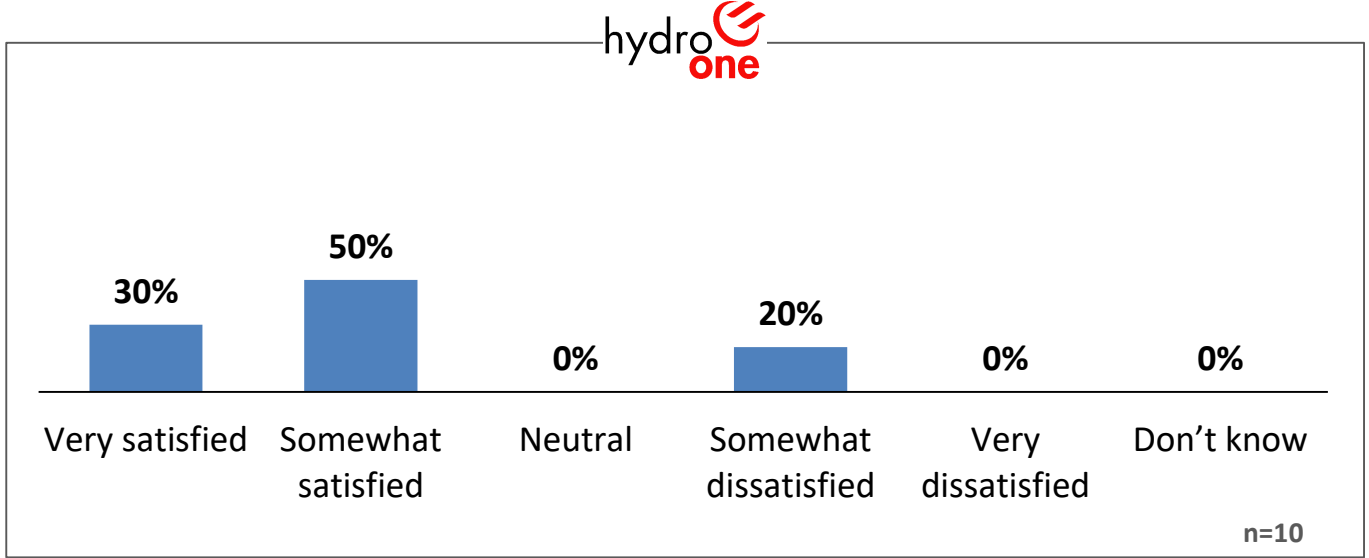
Note: Interpret values with caution, as sample size is very small.



## Satisfaction with Hydro One's Services



Thinking specifically about the services provided to you and your community by Hydro One, overall, how satisfied or dissatisfied are you with the services that you receive?



Note: Interpret values with caution, as sample size is very small.



Q

Is there anything in particular you would like Hydro One to do to improve its services to you?

*"More accessible reporting online. Currently limited to one login but as a large facility, many users may require access to the data."*

*"Take back the energy efficiency programs."*

*"Already doing good . but still need to focus on power quality issue."*

*"Many outages in Ottawa Valley. Some components are dated and needs to be changed."*

*"Be more efficient."*

*"Quality of power and reliability."*

Q

How do you know if Hydro One is doing a good job for you, or not?

*"Reliable, uninterrupted service"*

*"A good power quality, low rates and good customer service."*

*"Less number of unplanned power shortage and power quality."*

*"Number of unscheduled outages, power dips etc."*

*"Responding to issues, or not."*

*"I don't."*

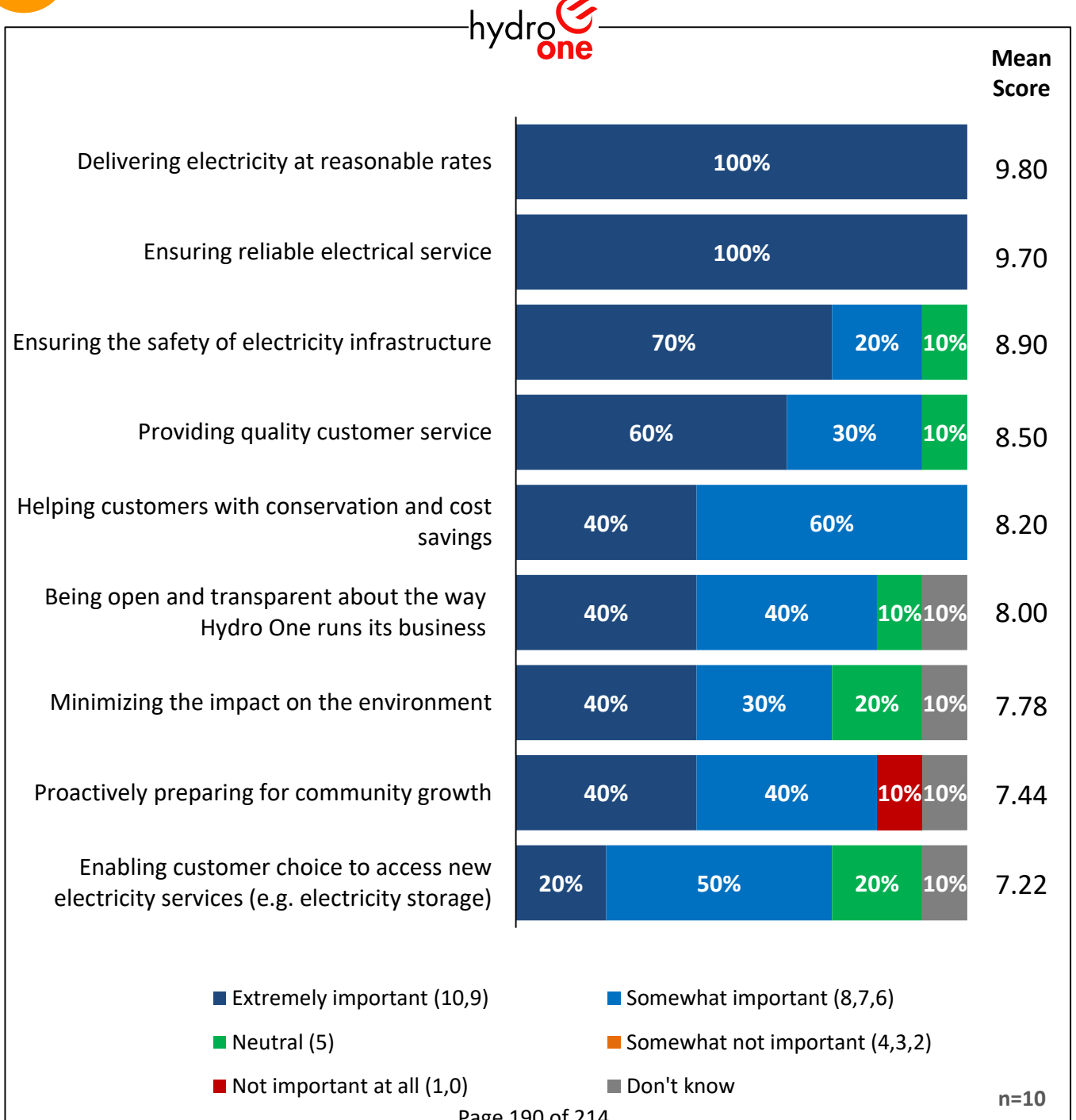
*"Experience."*



### Outcome Priorities

Through previous customer research and contacts, a number of outcomes were identified by customers as priorities for Hydro One. We would like to check that list with you to ensure it is complete. We also want to understand the priorities you give to different outcomes.

**Q** How important are each of the following Hydro One priorities to you as a customer?



Note: Interpret values with caution, as sample size is very small.





### Outcome Priorities

Through previous customer research and contacts, a number of outcomes were identified by customers as priorities for Hydro One. We would like to check that list with you to ensure it is complete. We also want to understand the priorities you give to different outcomes.

Q

The list above may not include all the outcomes that matter to you. Are there any other important priorities that Hydro One should be focusing on that weren't included in the list above?

*"Help reducing the GA cost"*

*"Reliable service"*

*"Delivering electricity at reasonable rates"*

*"Enabling customer choice to access new electricity services"*

*"Ensuring reliable electrical service"*

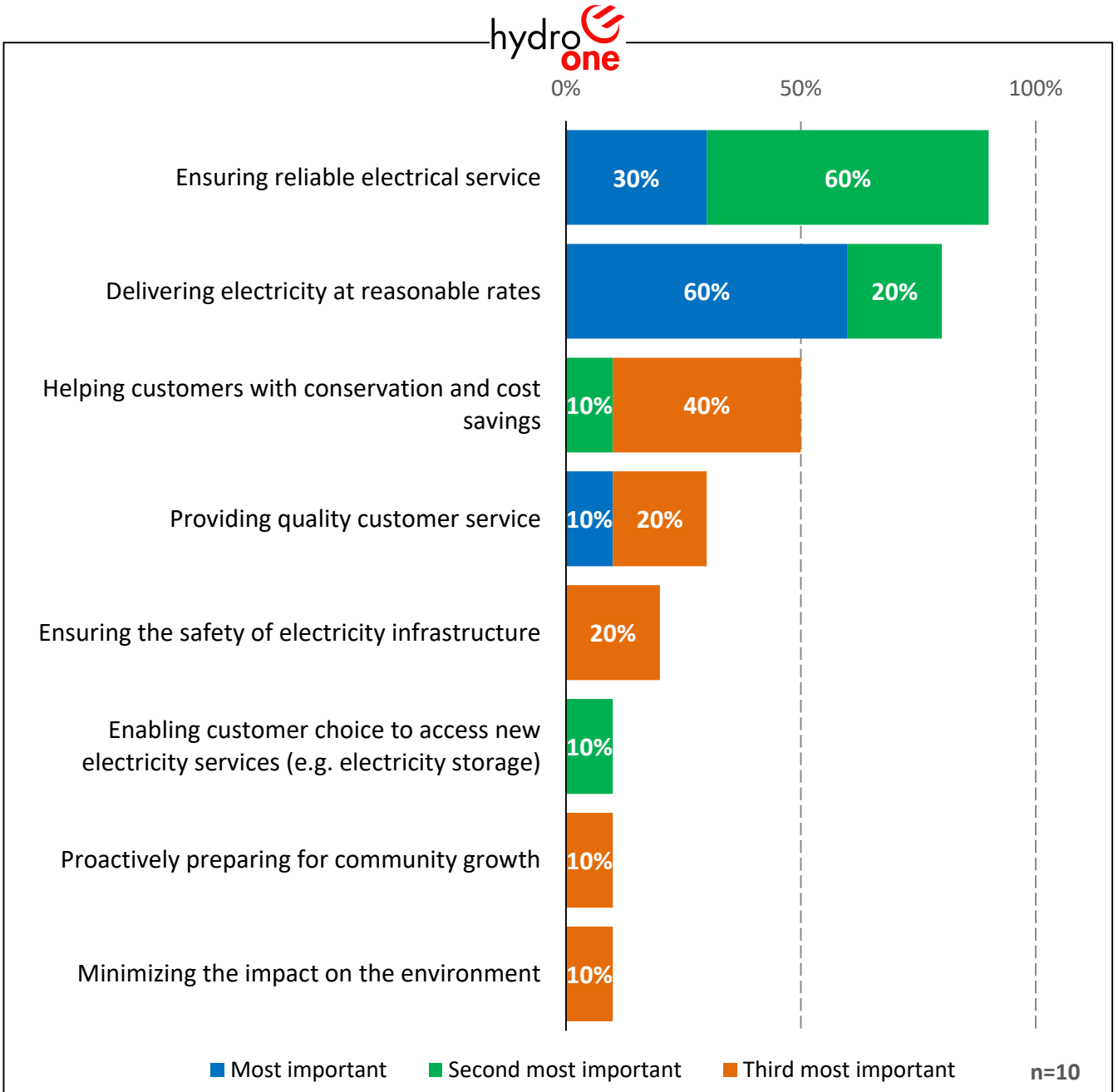
*"Helping customers with conservation and cost savings"*

*"Proactively preparing for community growth"*



## Outcome Priorities

**Q** Thinking again about the things Hydro One should be focusing on, please rank your top 3 priorities—where “1” would be the most important, “2” the second most important, and “3” the third most important.



Note: Interpret values with caution, as sample size is very small.



Q

Now, let's talk about the reliability of electricity service you receive. Have you experienced any power outages at home in the past 12 months, which lasted longer than one minute? If so, approximately how many of these power outages did you experience?

	Total
No outages	30%
1 outage	-
2 outages	10%
3 outages	20%
4 outages	10%
5 outages	10%
6 outages	-
7 outages	-
8 or more outages	10%
Don't know	10%

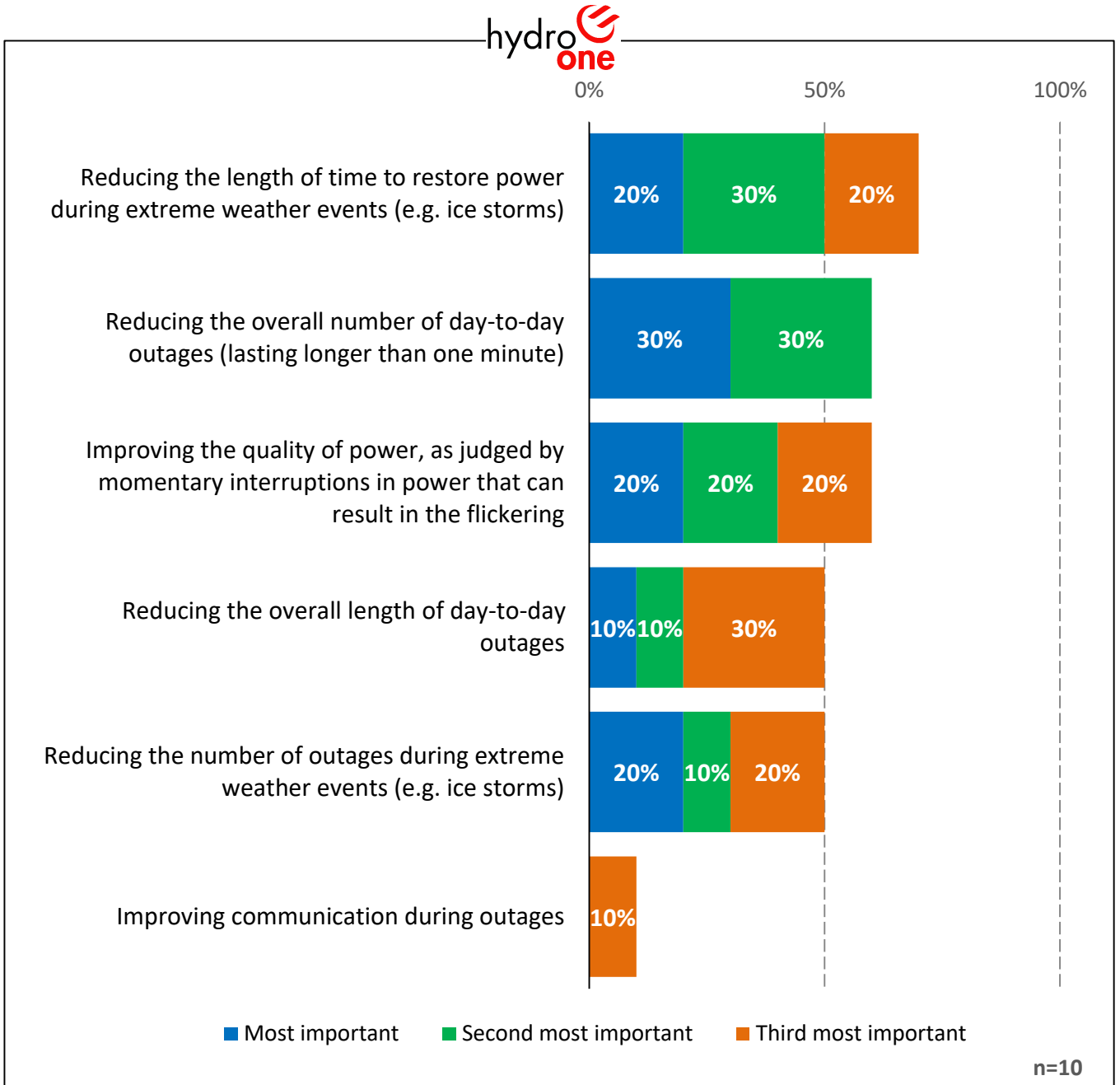
Note: Interpret values with caution, as sample size (n=10) is very small.



## Reliability Experience and Priorities

When it comes to reliability, there are a number of areas that Hydro One could focus on. For example, Hydro One could focus on improving day-to-day reliability and/or reducing interruptions during storms and other extreme weather.

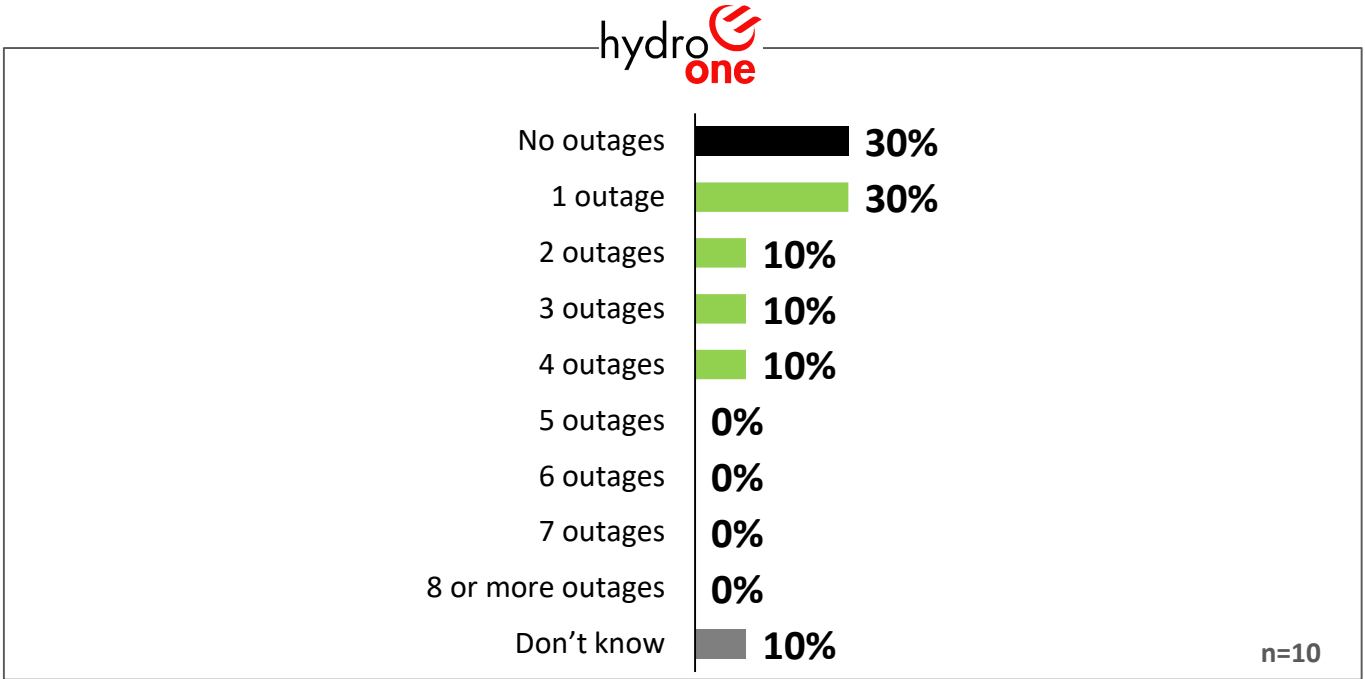
**Q** Among the following reliability outcomes, please rank your top 3 priorities—where “1” would be the most important, “2” the second most important, and “3” the third most important.



Note: Interpret values with caution, as sample size is very small.

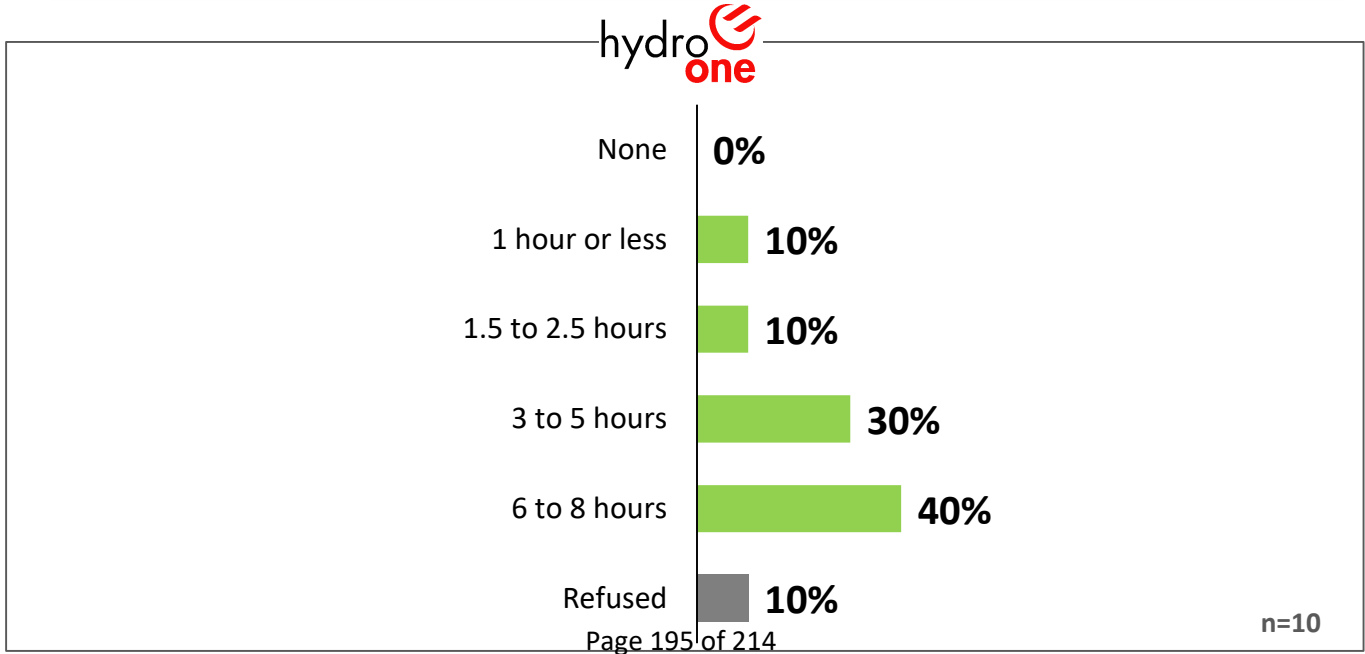


**Q** What would you say is a reasonable number of outages that Hydro One customers should expect to experience every year?



Note: Interpret values with caution, as sample size is very small.

**Q** What would you say is a reasonable total length of outages that Hydro One customers should expect to experience every year?



Note: Interpret values with caution, as sample size is very small.



## Comparing Hydro One's Spending to Others

### Hydro One's Investment Plan

On a yearly basis, Hydro One's spending for the distribution side of the business is benchmarked by the OEB against other electricity distributors in Ontario.

Servicing more sparsely populated areas means that, compared to urban areas, more equipment (e.g. wooden poles, transformers and wires) is needed to serve the same number of customers.

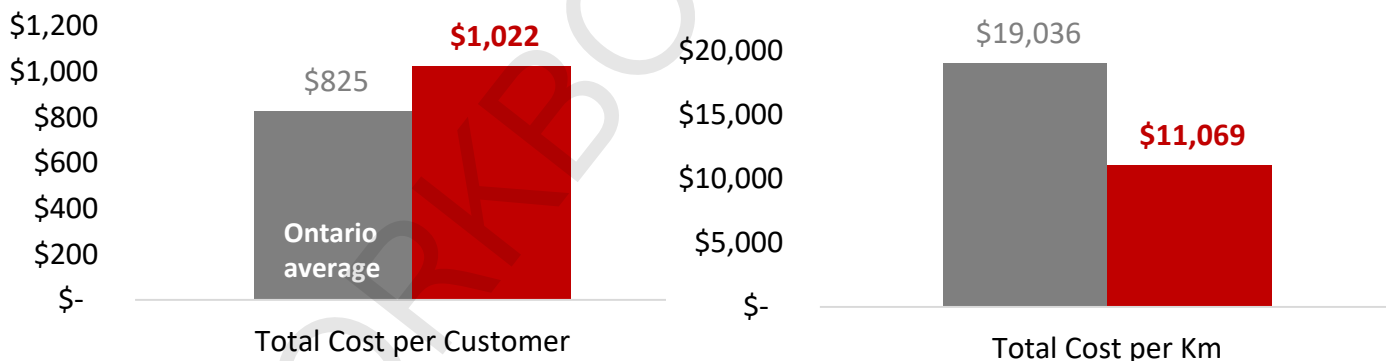
**On average, across Ontario 23 customers are served per kilometer of distribution line; in Hydro One's territory it is only 11 customers per kilometer.**

When we compare Hydro One to other electricity distributors, how well Hydro One compares depends on whether we look at cost per customer or cost per line km.

On a total cost per customer basis, it costs nearly \$200 more per customer for Hydro One to operate than the Ontario average. But when looking at the total cost per kilometer of distribution line, Hydro One's costs are \$8,000 below the Ontario average.

### Comparing Hydro One to Other Electricity Distributors (2018)

Source: 2018 OEB Benchmarking Report





## Comparing Hydro One's Spending to Others

**Benchmarking isn't the only way that Hydro One measures its operational efficiency.**

Like most businesses, Hydro One manages its spending in two budgets – a **capital budget** and an **operating budget**.

Its **capital budget** covers items that, once purchased, have lasting benefits over many years. This includes much of the equipment that is part of the distribution and transmission systems, such as poles, wires, cables, transformers, computers and information systems, vehicles and facilities.

**This phase of the engagement is focused on collecting your views on competing trade-offs in capital investments. These will be presented on the following pages.**

Hydro One's **operating budget** covers recurring expenses, such as the maintenance of equipment and the cost of customer service and billing.

In Hydro One's last rate application, the OEB limited the rate of Hydro One's annual operating cost increases by an amount that is less than inflation to incent the company to find ways of achieving the same outcomes for less money. Since 2015, Hydro One's operating costs have fallen by 4%.

The OEB runs an open and transparent review process where experts from the Ontario Energy Board (OEB) and intervenor groups review and challenge every dollar that Hydro One proposes to spend. Detailed discussion of Hydro One's operating budget is left to experts from the OEB and intervenors in the formal rate application review.

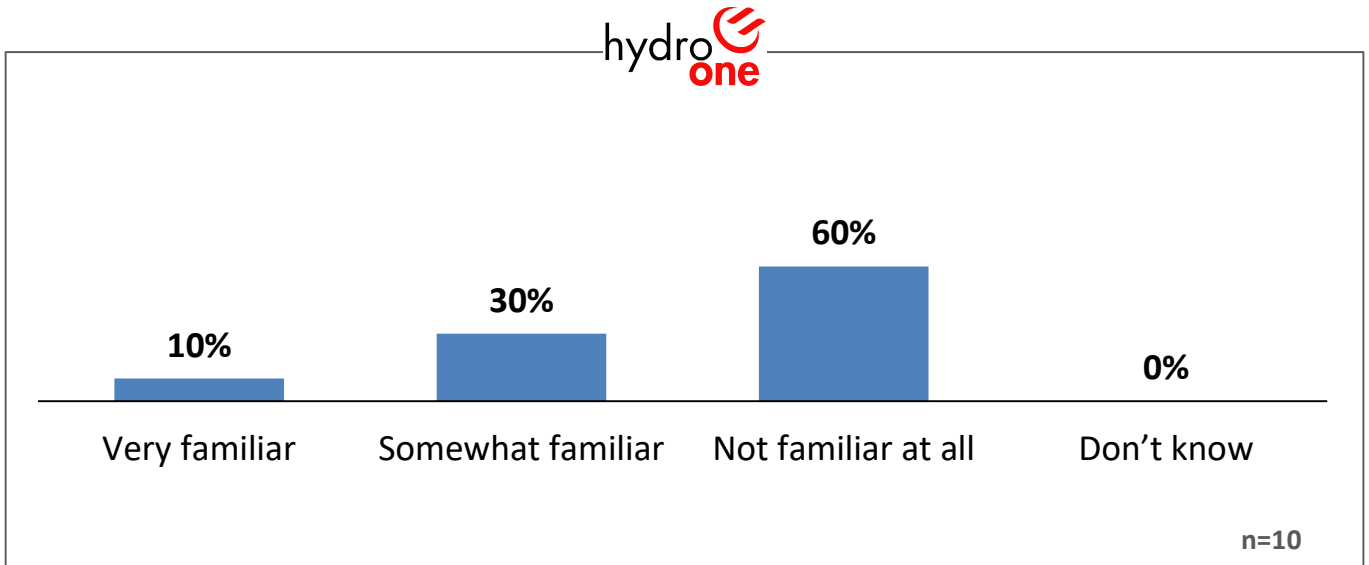
**Detailed questions about Hydro One's operating expenses will not be asked in this phase of the customer engagement.**

If you are interested in commenting on Hydro One's operating expenses, you are encouraged to participate in the OEB process when Hydro One files this application in 2021. Details will be available at that time at [oeb.ca/participate](http://oeb.ca/participate).



### Comparing Hydro One's Spending to Others

**Q** Before this survey, how familiar were you with the OEB review process and the requirement for Hydro One to find operating savings every year?



Note: Interpret values with caution, as sample size is very small.

### Additional Comments

*"Comparison should be done vs other markets like QC, Winnipeg and the USA"*





## Keeping Pace with Aging Distribution Infrastructure

Making Choices for Hydro One's Distribution System

**First, we would like to speak to you about Hydro One's distribution system.**

Most of Hydro One's distribution infrastructure (e.g. equipment like wooden poles, power transformers, and submarine cables) is now roughly 60 to 70 years old. Eventually, aging equipment deteriorates and has to be replaced to mitigate reliability, safety and environmental risks.



Hydro One has some control over when to make those investments.

Hydro One's **current approach** is to replace only the most critical aging equipment before it stops working. While Hydro One replaces aging equipment before it poses a safety, environmental or reliability risk, this still leaves 24% of station transformers and about 5% wooden poles currently in poor condition. Under Hydro One's current approach, the number of poles and station transformers in poor condition gets larger each year.

Hydro One's planners have identified **four options** for replacing aging equipment: Hydro One can continue its current level of investment, it can invest less, it can invest more to keep the percentage of aging equipment constant, or it can invest more to improve the percentage of aging equipment.

**Investing less** now would keep rate increases lower in the short term, but would lead to steeper rate increases in the future, as more equipment would need to be replaced later.

**Investing more** now, would mean higher rate increases now, but lower rate increases in the future, as Hydro One would replace more of its aging infrastructure now.

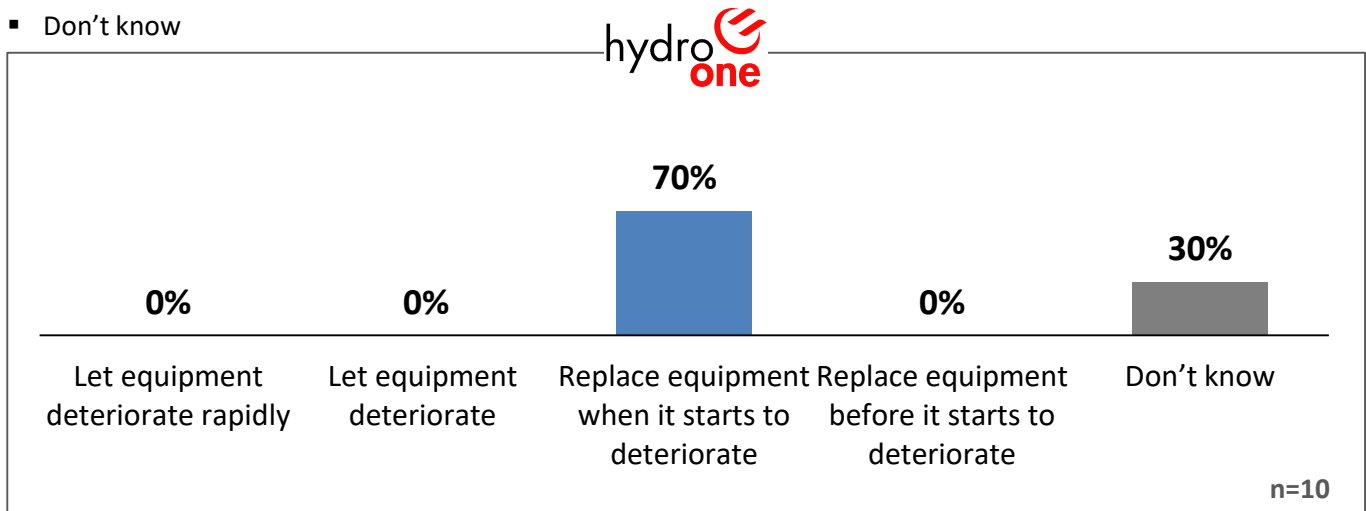


## Keeping Pace with Aging Distribution Infrastructure

Q

Which of the following statements best represents your point of view regarding Hydro One's approach to dealing with aging infrastructure?

- **Let Equipment Deteriorate Rapidly:** Hydro One should **decrease its current level of investment** in aging equipment to keep annual rate increases for new equipment [**about \$30 to \$40/under \$35/under \$110/under \$300**] on my organization's monthly bill, even if it means the share of aging equipment will grow rapidly and future rate increases will be very steep.
- **Let Equipment Deteriorate:** Hydro One should **maintain its current level of investment** in aging infrastructure to keep annual rate increases for new equipment [**about \$40 to \$60/between \$35 and \$55/between \$110 and \$165/ between \$300 and \$450**] on my organization's monthly bill, even if it means equipment will age faster than it is replaced (but less quickly than in the scenario above) and future rate increases will be steep.
- **Replace Equipment When It Starts to Deteriorate:** Hydro One should **increase its current level of investment** in aging infrastructure to keep annual rate increases for new equipment [**about \$65 to \$85/ between \$55 and \$85/between \$165 and \$250/between \$450 and \$700**] on my organization's monthly bill, to keep pace with aging equipment and enable smoother rate increases in the future.
- **Replace Equipment Before It Starts to Deteriorate:** Hydro One should **increase its current level of investment** in aging equipment to keep annual rate increases for new equipment [**about \$100/ between \$85 and \$120/between \$250 and \$350/between \$700 and \$1,000**] on my organization's monthly bill, which will improve the average age of equipment and enable stable rate increases in the future.
- Don't know



Note: Interpret values with caution, as sample size is very small.

### Additional Comments

*"Ensure proper condition-based maintenance program is in place"*

*"Not enough information to comment on this"*

# Online Workbook

## Ensuring Day-to-Day Reliability



### Making Choices for Hydro One's Distribution System

As previously mentioned, Hydro One's service territory is much larger and includes more rural areas than those of other electricity distributors in Ontario. Due to this geography, Hydro One's distribution system looks different than other distribution systems in Ontario.

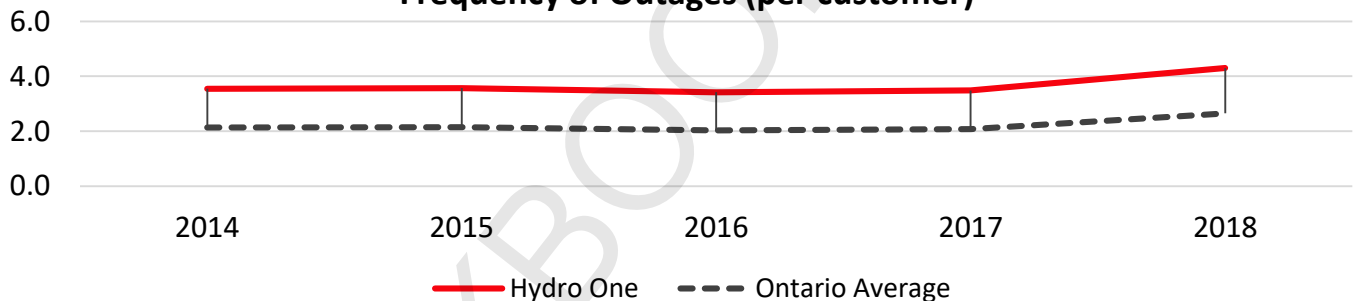
When Hydro One's system was first built, simple *radial lines* were constructed in rural areas. A radial line has only one power source for a group of customers. A power failure, short-circuit, or a downed power line interrupts power for all customers further down the line. While a *looped line* can restore power by bringing it in from another direction, power cannot be restored in a radial line until the source of the outage is found and repaired.

Compared to other local distribution companies, Hydro One now has more of those radial lines. They are less reliable than looped lines, which are standard in denser urban areas.

Hydro One tracks both the average number of power outages per customer and how long those outages last. The average Hydro One customer experiences more frequent and longer outages than the average Ontarian.

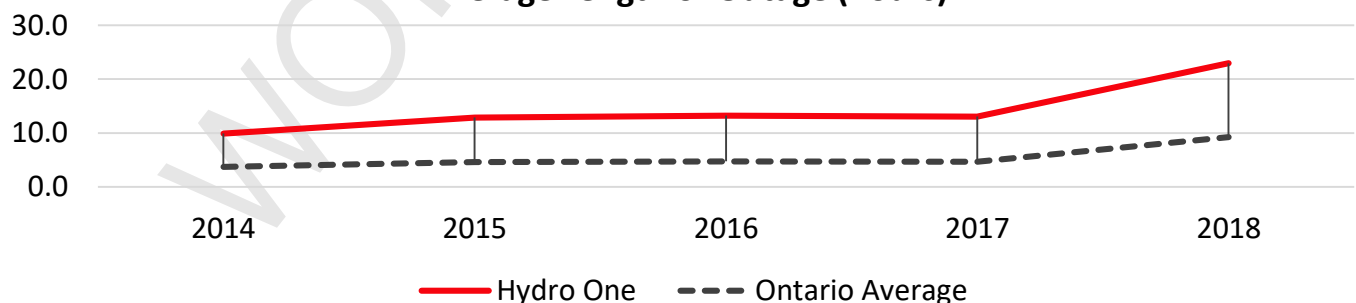
On average, between 2014 and 2018, the typical Hydro One customer has experienced 1.5 more outages per year compared to the Ontario average.

**Frequency of Outages (per customer)**



When it comes to total time spent without electricity each year, the typical Hydro One customer, since 2014, has been without power for 14.4 hours each year. That is 9 hours more than the Ontario average.

**Average Length of Outage (hours)**



There are investments that Hydro One can make to improve reliability, especially of radial lines, such as remote monitoring, remotely operable equipment and battery storage. While these investments are likely to reduce both the number and length of outages, they would add to the costs of the system.

# Online Workbook

## Ensuring Day-to-Day Reliability

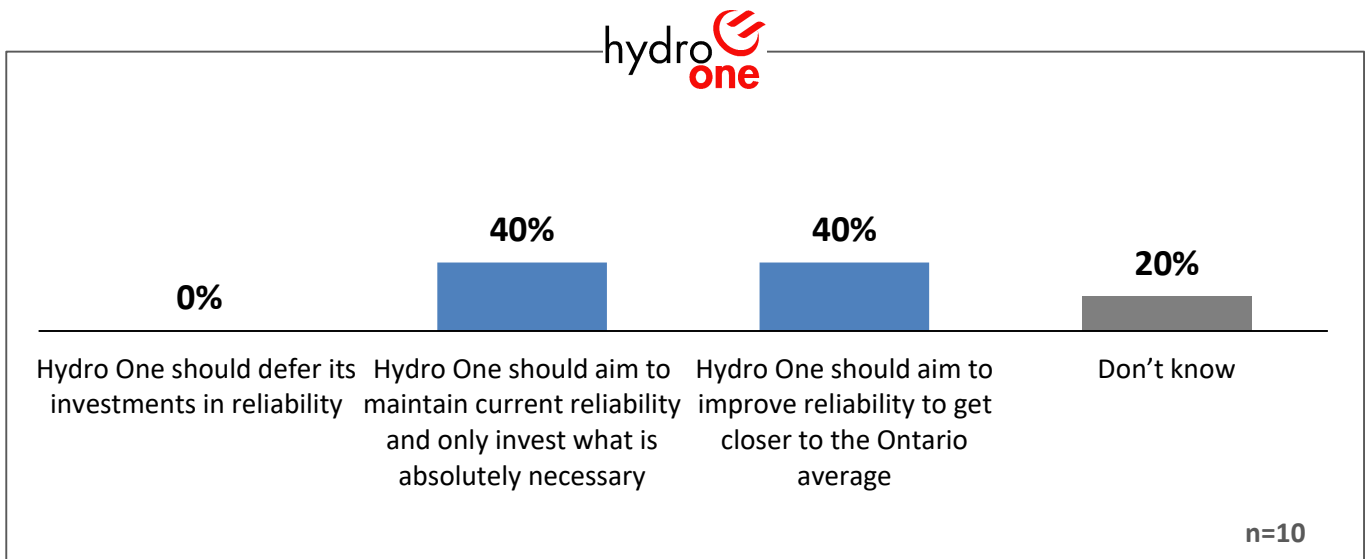
Large Distribution Accounts



Q

Which of the following statements best represents your point of view regarding Hydro One's approach to ensuring day-to-day reliability?

- Hydro One should defer its investments in reliability to keep costs down, even if this could lead to more or longer power outages in the future.
- Hydro One should aim to maintain current reliability and only invest what is absolutely necessary to maintain the current level of reliability, even if that increases my organization's monthly bill by **[about \$20 to \$35/ less than \$20/less than \$60/less than \$180]** each year.
- Hydro One should aim to improve reliability to get closer to the Ontario average, even if that increases my organization's monthly bill by **[about \$50 to \$65/less than \$60/less than \$180/less than \$500]** each year.
- Don't know



Note: Interpret values with caution, as sample size is very small.

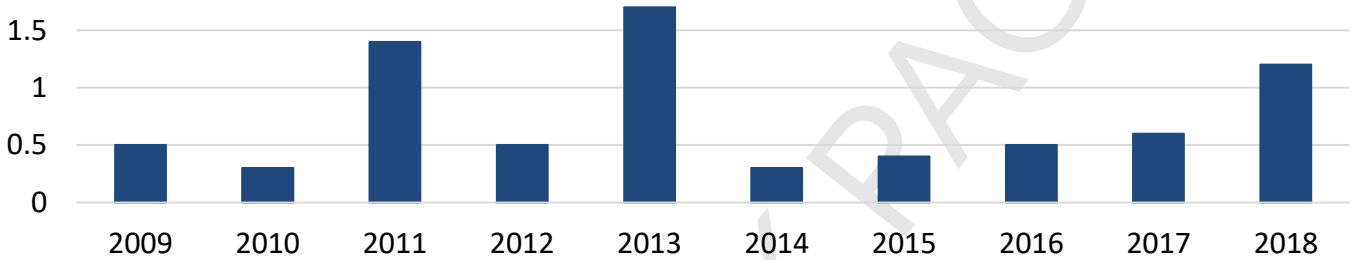
### Additional Comments

*"Organization downtime is costlier than this cost."*

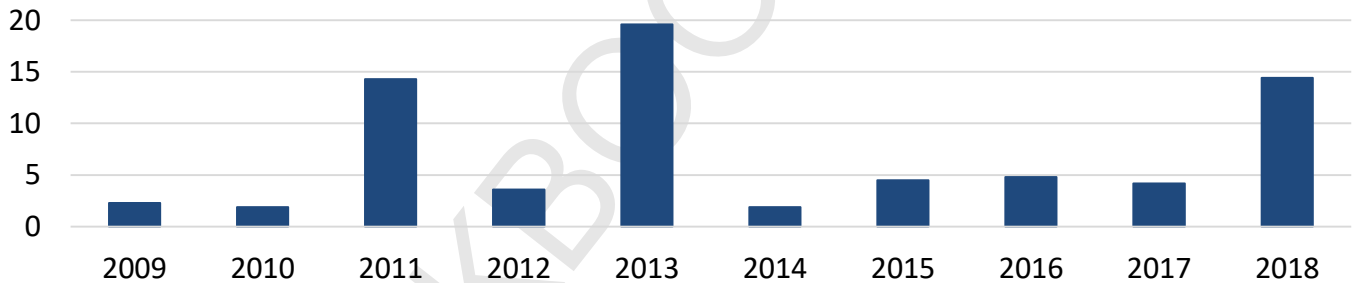
#### Making Choices for Hydro One's Distribution System

Over the past ten years, severe weather, such as ice storms, windstorms or thunderstorms, has caused multiple outages that tended to last longer than regular day-to-day outages. In 2018, the average Hydro One customer was without power for an average total of 7 hours due to day-to-day outages. When the effect of storms are included, the total average duration was 23 hours for the average Hydro One customer.

#### Frequency of Outages (per customer) Caused by Severe Weather



#### Average Duration of Outages (hours) Caused by Severe Weather



The occurrence and severity of weather events are largely unpredictable. The number and duration of outages caused by severe weather have varied year-by-year.

Currently, Hydro One does not have a designated program to focus on minimizing the impacts of severe weather. However, there are investments Hydro One could make to make the system more resilient to help mitigate the potential impacts of severe weather. These types of investments could include building infrastructure to a higher, more redundant standard.

Any investments Hydro One would make would be based on previous experience and estimates of future major events. However, because major events are unpredictable, these investments may not match the events Hydro One actually experiences.

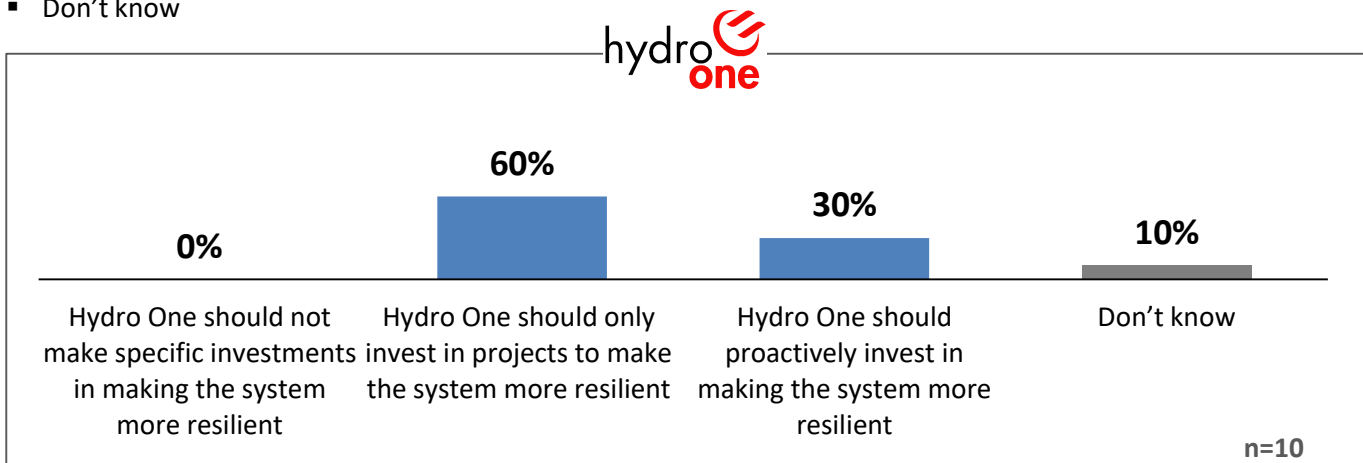
# Online Workbook

## Responding to Severe Weather



Q Which of the following statements best represents your point of view?

- In order to keep rates down, Hydro One should not make specific investments in making the system more resilient to severe weather, even if that means no improvements or potential increases in the length and number of outages caused by severe weather.
- Hydro One should only invest in projects to make the system more resilient to severe weather as part of the ongoing replacement of old or failing equipment, but not more, even if that increases my organization's monthly bill by [about \$2 to \$8/less than \$5/less than \$15/less than \$40] each year.
- Hydro One should proactively invest in making the system more resilient in order to reduce the length and number of outages caused by severe weather, even if that increases my organization's monthly bill by [about \$13 to \$17/less than \$30/less than \$100/less than \$300] each year.
- Don't know



Note: Interpret values with caution, as sample size is very small.

### Additional Comments

*"As an industrial site we have a specific critical safety factor at play when unplanned outages (usually caused by extreme weather) cause us to take an unplanned stop with no ability."*

*"Hydro One is in the business of delivering power to the people and businesses of Ontario. For that we pay associated fees and rates. Therefore the responsibility for delivering affordable and reliable power at the most economic rate should be HONI's mandate. Not that of its customers. That is why I answered "Don't know" on all these questions. I am not asking our customers how to run our business neither."*

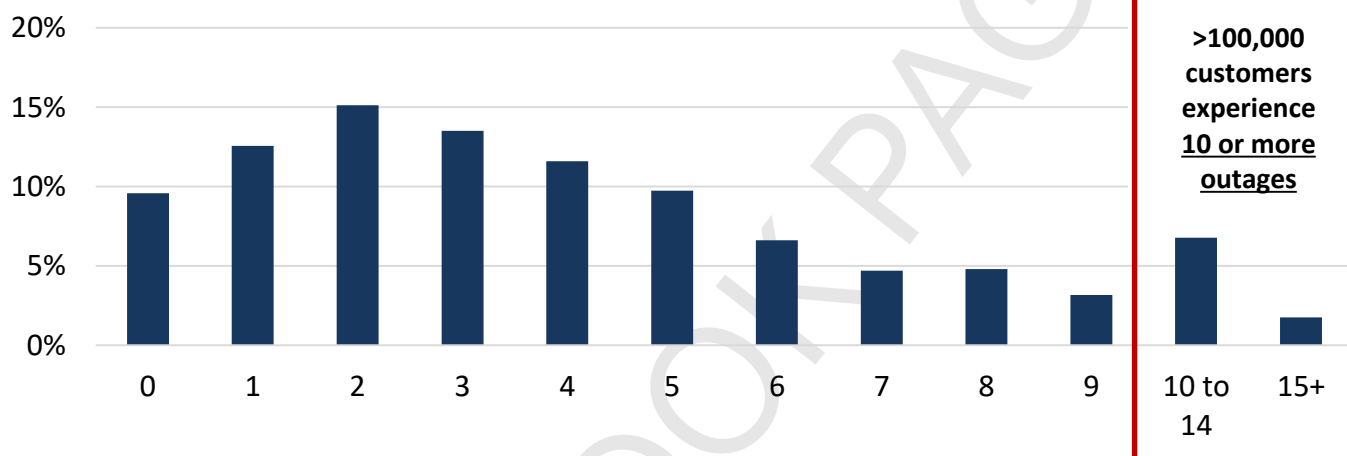


#### Making Choices for Hydro One's Distribution System

Hydro One customers experience different levels of reliability, depending on where they live, equipment and the historical legacy of when the system was built.

While some Hydro One customers didn't experience any outages in 2017 or 2018, others were without power more than 15 times per year. Similarly, the total length of time that customers were without power ranged from less than one hour to more than 50 hours per year.

#### Average Number of Outages Per Customer (2018)



There are investments Hydro One can make to bring customers experiencing poor reliability closer to the system average. This includes modernizing certain distribution lines by adding remote monitoring, switches to detect and isolate the cause of a power interruption, and batteries to minimize the impact on customers.

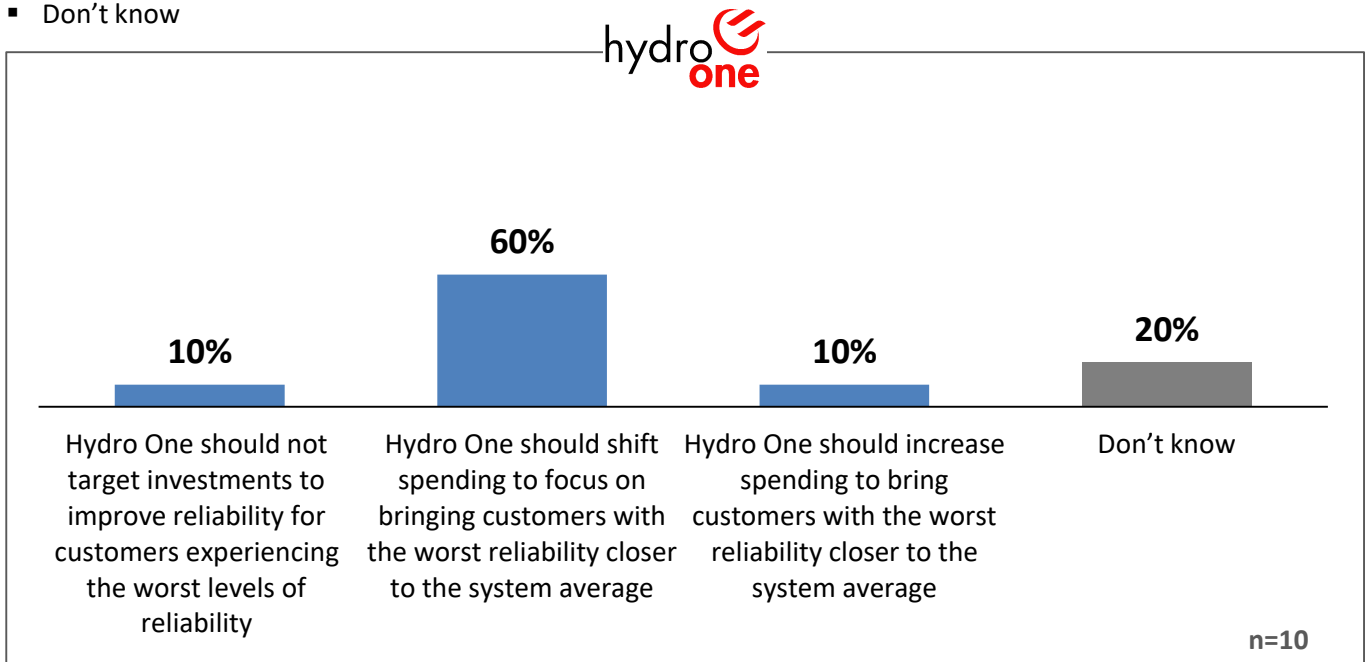
#### There are two ways Hydro One can fund improvements for these customers:

- Hydro One can shift spending away from circuits that experience average or better reliability to those with poor reliability. That will mean customers on circuits with average or better reliability will likely experience small declines in reliability, while customers with the worst reliability will see significant improvements.
- Hydro One can increase spending to provide additional resources for customers with the worst reliability and keep spending the same on circuit with average or better reliability. With this approach, no customer will be worse off, while customers with the worst reliability will see significant improvements.



Q Which of the following statements best represents your point of view?

- Hydro One should not target investments to improve reliability for customers experiencing the worst levels of reliability in order to keep costs down, even if that leaves some with worse reliability than others.
- Hydro One should shift spending to focus on bringing customers with the worst reliability closer to the system average without raising prices, even if that means that reliability may go down for customers whose reliability is currently average or above.
- Hydro One should increase spending to bring customers with the worst reliability closer to the system average, even if that increases my organization's monthly bill by [about \$6 to \$8/under \$10/less than \$30/less than \$100] each year.
- Don't know



Note: Interpret values with caution, as sample size is very small.



#### Making Choices for Hydro One's Distribution System

One of the issues that Hydro One planners face is whether to continue building out the distribution system in areas where economic development is expected to lead to future growth. Certain pockets across Ontario are experiencing regional growth and economic development, which leads to the need for greater investments in infrastructure to meet the demand for electricity.

Currently, in order to keep rates low, Hydro One **reactively increases the capacity of its system** to address community and economic growth. That means Hydro One only adds new capacity to its system when there are firm expectations of new demand and most of the costs to expand are borne by the connecting customers.

Some communities have expressed concern that, with this approach, it is difficult to attract new businesses to their community. For instance, not all communities currently have access to the level of power needed to grow and attract new businesses. While the level of power required to service a home is available across Hydro One's service territory, some businesses, including gas stations, grocery stores, and motels, require a greater electrical capacity to operate.

To help regional and economic development, Hydro One could take on a more **proactive role** and make the investments necessary to increase the capacity needed to supply communities where future growth is projected. If Hydro One responds to these communities and builds that capacity, all Hydro One customers will share the cost of adding this infrastructure, particularly if no businesses come. Communities say that attracting new business will increase demand and that will spread the costs out.

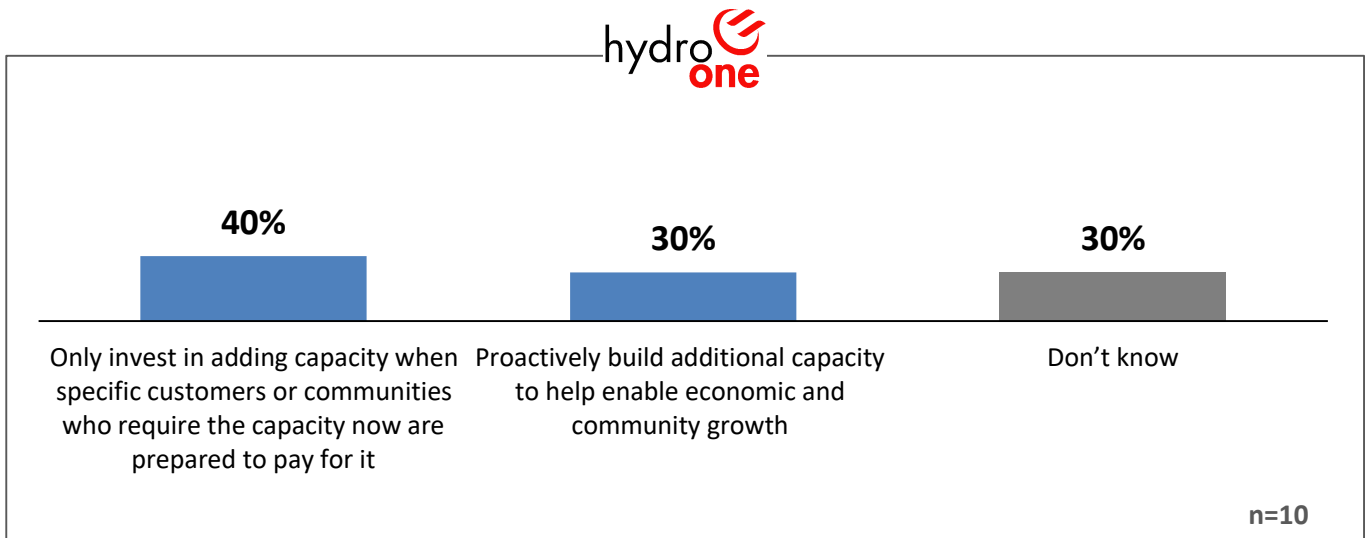
The question is whether customers would like Hydro One to promote or react to economic growth in the communities it operates in.





Q Which of the following statements best represents your point of view?

- Hydro One should only invest in adding capacity when specific customers or communities who require the capacity now are prepared to pay for it.
- Where a local community asks for it, Hydro One should proactively build additional capacity to help enable economic and community growth based on a forecast of the area's future requirements, even if these investments increase my organization's monthly bill by [about \$20 to \$25/less than \$35/less than \$100/less than \$300] each year.
- Don't know



Note: Interpret values with caution, as sample size is very small.

### Additional Comments

*"Invest as per the community growth."*



## Keeping Hydro One's Business Running

### Making Choices for Hydro One's Distribution System

Hydro One is more than just poles and wires – it's a business that needs to invest in equipment such as tools, trucks, buildings, computers and software.

When deciding whether to continue to maintain existing equipment or replace them, Hydro One considers whether the risks and costs of continuing to use it outweigh the benefits of waiting longer to replace it. Delaying investments may make it harder for staff to do their jobs safely and maintain reliability and security standards.



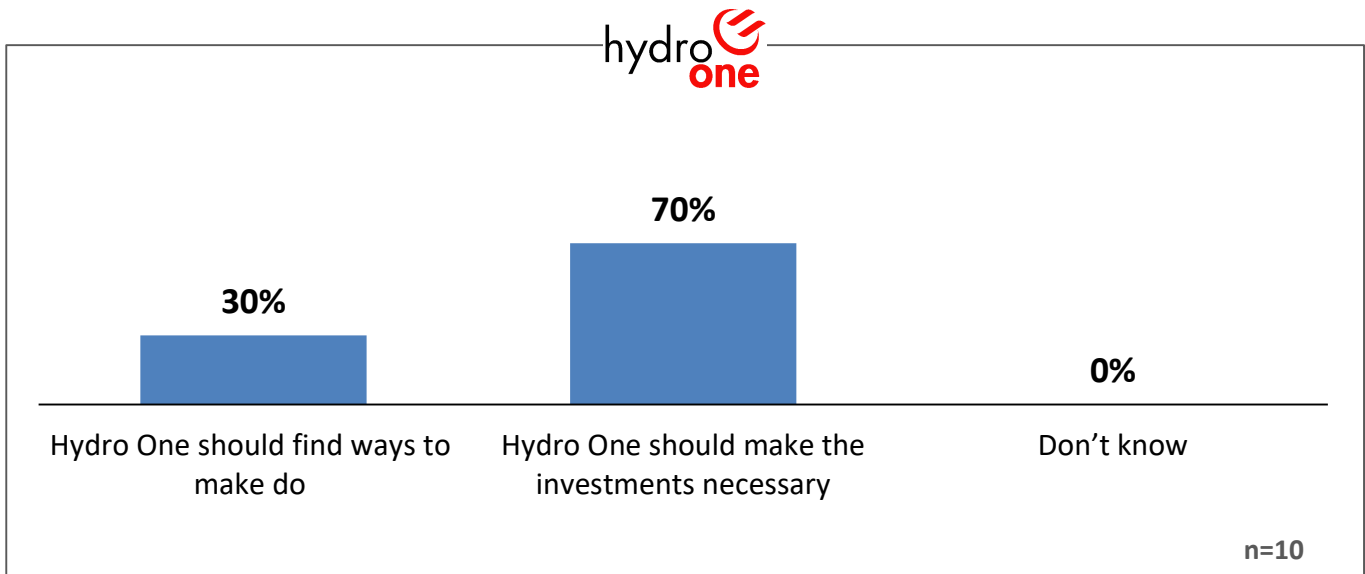


## Keeping Hydro One's Business Running

Q

Which of the following statements best represents your point of view?

- Hydro One's should find ways to make do with the facilities, equipment, vehicles and IT and computer systems it already has and only replace the equipment with the most urgent needs, even if that means increasing risk to safety, reliability, and security.
- Hydro One's should make the investments necessary to ensure its staff will have access to equipment of the same standard as similar sized businesses.
- Don't know



Note: Interpret values with caution, as sample size is very small.

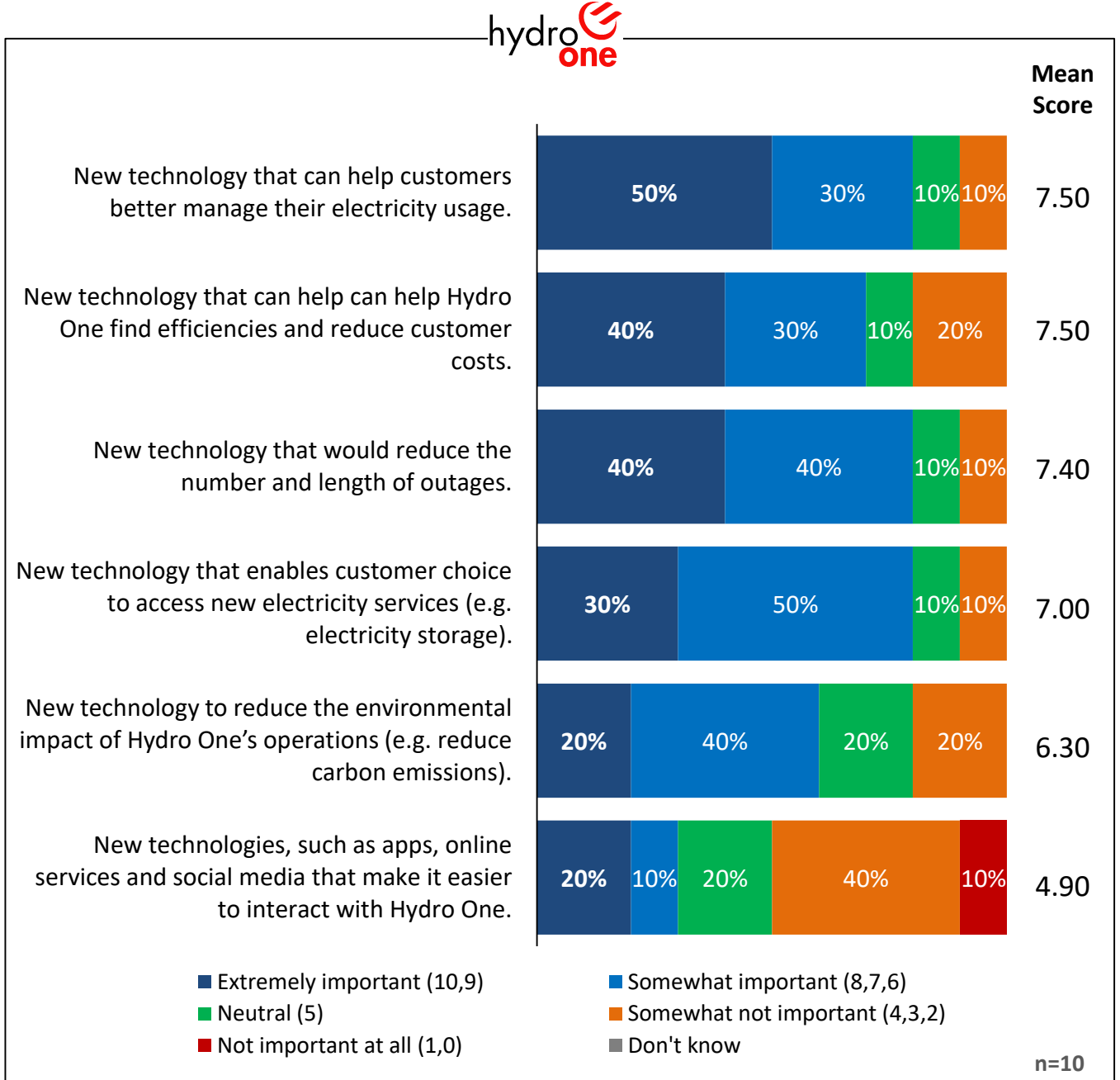
# Online Workbook

## Investing in New Technology



Another investment category is related to new technology that Hydro One could invest in to address a range of issues. These include reliability, efficiency, customer service, Hydro One’s impact on the environment, new service offerings and tools to manage electricity usage.

**Q** How important are each of the following investments in new technology that Hydro One could focus on?



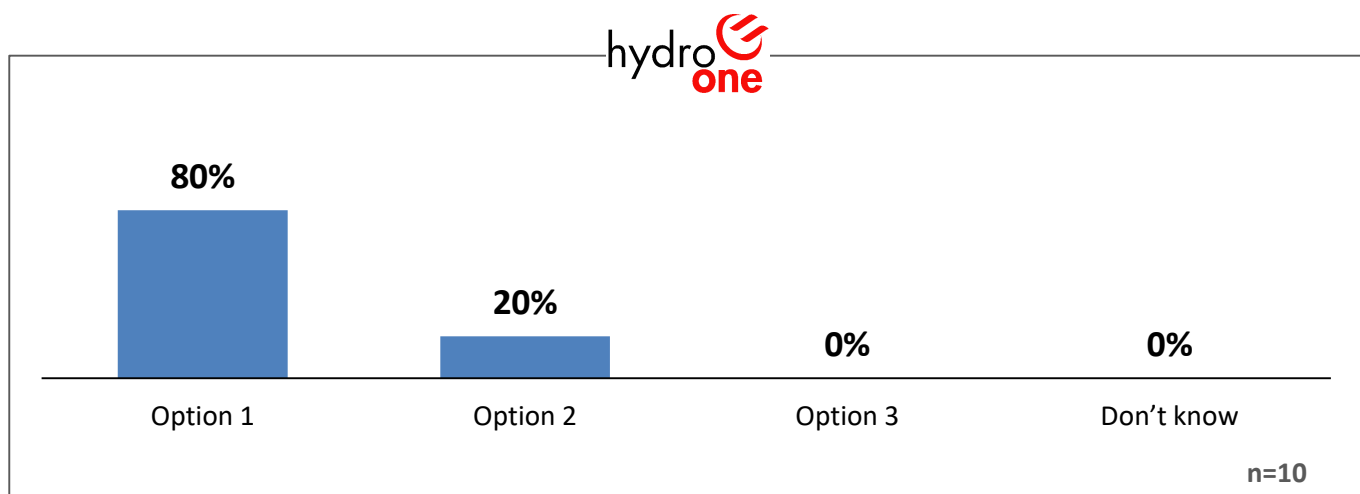
Note: Interpret values with caution, as sample size is very small.



Q

Which of the following statements best represents your point of view when it comes to investing in new technologies?

- **Option 1:** Hydro One should only invest in new technologies if there is clear evidence that these technologies will lead to positive outcomes.
- **Option 2:** Hydro One should pursue Option 1 and also invest in pilot projects for new technologies where the company sees a good chance that it would lead to positive outcomes.
- **Option 3:** Hydro One should not invest in these new technologies.
- Don't know



Note: Interpret values with caution, as sample size is very small.

# Sample Demographics

Large Distribution Accounts



## Attitudes Towards Electricity & Size

The cost of my organization's electricity bill has a major impact on the bottom line of my organization and results in some important spending priorities and investments being put off.	n-size
Strongly agree	6
Somewhat agree	4
Somewhat disagree	-
Strongly disagree	-
Agree (Strongly + Somewhat)	10
Disagree (Strongly + Somewhat)	-

Note: Interpret values with caution, as sample size is very small.

Customers are well served by the electricity system in Ontario.	n-size
Strongly agree	-
Somewhat agree	8
Somewhat disagree	1
Strongly disagree	1
Agree (Strongly + Somewhat)	8
Disagree (Strongly + Somewhat)	2

Note: Interpret values with caution, as sample size is very small.

Organizational Size	n-size
1 person	-
2 to 5 people	-
6 to 10 people	-
11 to 25 people	-
26 to 50 people	1
More than 50 people	9

Note: Interpret values with caution, as sample size is very small.

Note: Sums added before rounding. "Don't know/no opinion" not shown.



# Building Understanding.

For more information, please contact:

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1                   **B1 - DISTRIBUTED RESOURCE COALITION INTERROGATORY - 008**

2  
3                   **Reference:**

4                   Exhibit B-1-1, SPF Section 1.8

5  
6                   **Preamble:**

7                   HONI's Business Plan indicates that the Application includes an "assessment of circumstances,  
8                   challenges and other issues affecting planned investments" including building grid resilience  
9                   against climate change. HONI's System Plan includes an analysis of the impacts of climate change  
10                  on its network. HONI indicates that part of its adaptation response to climate change includes  
11                  investments and expenditures related to deploying DERs to provide backup power. Part of HONI's  
12                  mitigation response to climate change includes the transition of its commercial fleet to low or  
13                  zero emission technology. HONI further indicates that the connection of customer DERs "may also  
14                  contribute to reduction of [HONI's] Scope 2 emissions."

15  
16                  **Interrogatory:**

- 17                  a) Please identify any and all in which electrification, electric mobility, EVs, and electrified  
18                  transportation charging were included or considered as mitigating or aggravating factors in  
19                  HONI's assessment of the risks associated with climate change.  
20  
21                  b) Please provide in tabular format HONI's anticipated annual Scope 1, 2, and 3 emissions over  
22                  the Application period (2023-2027) and please indicate the anticipated reductions in Scope 1,  
23                  2, and 3 emissions attributable to HONI's mitigation and adaption responses related to DERs.  
24  
25                  c) Please provide any and all analysis undertaken by HONI in quantifying its Scope 1, 2, and 3  
26                  emissions. Please also provide any and all modelling or other analysis HONI has undertaken  
27                  to estimate reductions in its Scope 1, 2 or 3 emissions.

28  
29                  **Response:**

- 30                  a) Hydro One's assessment of the risks associated with climate change focuses on the Company's  
31                  ability to adapt its business to the operational challenges posed by a changing climate, and  
32                  mitigate its contributions to greenhouse gas (GHG) emissions, as described in Ex. B-1-1, SPF  
33                  Section 1.8. Hydro One has not conducted a broader "assessment of the risks associated with  
34                  climate change." Within the scope of the Company's planning, conversion of Hydro One fleet  
35                  to EVs and Hybrid Vehicles will reduce the Company's Scope 1 emissions and have been  
36                  considered in estimates of overall GHG emission reduction. Other initiatives such as the IVY  
37                  charging network, installation of EV chargers at Hydro One sites and supporting electrification

1 of Hydro One customers are all enablers to support Ontario's efforts to decarbonize. Although  
2 beneficial overall, these other initiatives do not contribute to Hydro One's Scope 1 and 2 GHG  
3 reductions.

4

5 b) and c)

6

7 Hydro One has made preliminary estimates of Scope 1 and 2 GHG emissions in 2030, however  
8 the level of detail for the future generation mix of the province does not allow Hydro One to  
9 reasonably estimate year-over-year. Specific allocations for DERs are not available.

10

11 Please refer to interrogatory B1-PP-006, Attachment 1 for Hydro One's 2020 Sustainability  
12 Report which includes the Company's latest verification of its Scope 1 and 2 GHG emissions.

1                   **B2 - DISTRIBUTED RESOURCE COALITION INTERROGATORY - 009**  
2

3                   **Reference:**

4                   Exhibit B-2-1, TSP Section 2.11, T-SA-06  
5

6                   **Preamble:**

7                   HONI proposes capital expenditures for protection and control modifications for DERs to preserve  
8                   its loading and protection capability in order to accommodate the connection of DERs on HONI's  
9                   distribution and other local distribution company distribution systems.  
10

11                  HONI indicates that "gross costs have been forecast based on current DER customer requests, and  
12                  anticipated future requests resulting from the IESO Industrial Conservation Initiative (ICI)  
13                  program."  
14

15                  **Interrogatory:**

16                  a) Please provide the number of DER customer requests for 2020 (actuals) and 2021-2027  
17                  (forecast) to support HONI's proposed capital expenditures.  
18

19                  **Response:**

20                  a) The connection agreements for 41 DER projects were executed between Hydro One and the  
21                  customers (including LDC customers) during 2020. The forecast number of DER customer  
22                  requests for the 2021 to 2027 period are given in the table below. As documented in ISD T-  
23                  SA-06 in Exhibit B-2-1, TSP Section 2.11, all the proposed transmission capital expenditures  
24                  required to enable the connection of these DER projects are fully recoverable from the DERs.  
25

<b>Year</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>
Number of DER Customer Requests	40	40	32	32	32	24	24

Filed: 2021-11-29  
EB-2021-0110  
Exhibit I  
Tab 7  
Schedule B2-DRC-009  
Page 2 of 2

1

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Witness: REINMULLER Robert

1                   **B3 - DISTRIBUTED RESOURCE COALITION INTERROGATORY - 010**

2  
3                   **Reference:**

4                   Exhibit B-3-1, DSP Section 3.11, D-SR-12

5  
6                   **Preamble:**

7                   HONI proposes several planned productivity initiatives, including investments to replace its legacy  
8                   AMI 1.0 system with a new AMI 2.0 system. HONI notes that the legacy system causes lost  
9                   opportunities for benefits and efficiencies and the replacement will provide “improved network  
10                  reliability and coverage, additional features, and AMI platform enhancements (e.g., enhanced  
11                  meter memory and increased network capacity) to address foreseeable future needs (e.g.,  
12                  increased adoption of [DERs] such as distributed generation, battery storage, and [EVs]).”

13  
14                  **Interrogatory:**

- 15                  a) Please outline and provide examples of additional complexities that HONI expects will be  
16                  introduced into the AMI and metering domains as DERs and EVs grow.
- 17  
18                  b) Please outline how AMI analytics and integration management will assist HONI to manage the  
19                  additional complexities associated with DERs and EVs. In addition, please explain why the use  
20                  of AMI data is important in the context of DERs and EVs.
- 21  
22                  c) Please provide any and all estimates of short-, medium-, and longer-term customer savings  
23                  that will result from the AMI.

24  
25                  **Response:**

- 26                  a) EV and DER adoption will increase the complexity of the distribution system through more  
27                  dynamic loading and generation, causing two-way power flow. At present, Hydro One has  
28                  limited visibility over the distribution network, and the company will need to manage complex  
29                  power flow conditions in real-time. Furthermore, consumers will want to benefit from new  
30                  technologies, such as EVs and DERs that provide them with convenience, help them save  
31                  money, and provide reliable electricity service, while lowering their carbon footprint. These  
32                  new technologies will allow customers to become prosumers, responding to demand-  
33                  response signals and Vehicle-to-Grid (V2G) charging, as long as the distribution system  
34                  enables these services. These consumer demands will increase the complexities that Hydro  
35                  One will have to manage and address as DER and EV adoption increases.

1 b) AMI 2.0 analytics can be used to address the complexities introduced by greater EV and DER  
2 adoption by providing insights to customers and system operators. AMI 2.0 data and analytics  
3 will be the most critical for managing complex functions, such as:

- 4
- 5 • AMI analytics will provide greater visibility into the location and status of EVs and  
6 DERs.
- 7 • AMI analytics will allow for better management of utility peak and load optimization  
8 (at distribution transformer and feeder level).
- 9 • AMI data can support real-time (or near real-time) load flow and protection studies.
- 10 • AMI data is essential for the establishment of future energy markets in which  
11 prosumers can buy and sell electricity, thus allowing utilities to optimize their  
12 networks.
- 13

14 c) The AMI 2.0 program will enable a range of savings/benefits to customers over the short,  
15 medium, and long-term. Over the coming years, Hydro One expects that customers will  
16 embark on an energy transition by adopting EVs and DERs and taking a greater interest in  
17 their overall carbon footprint. AMI 2.0 can enable both financial and carbon emissions savings  
18 through many of the advanced functionality that can be enabled. The customer's savings and  
19 benefits listed below are not exhaustive and Hydro One has not modelled all potential savings  
20 and benefits that may result from the AMI 2.0 deployment.

21

22 Short-Term

23 In the short-term term, upon installation of the AMI 2.0 meter and communication network,  
24 customers will continue to derive savings/benefits from the same core capabilities as AMI 1.0  
25 including over-the-air meter reading, real time outage messaging, provision of energy use  
26 information via on-line MyAccount Portal, basic voltage monitoring, and through the  
27 efficiencies gained in operationalizing AMI 1.0 (See DSP Section 3.3, Attachment 8 Smart  
28 Meter Efficiencies Report). In addition, upon installation, the new AMI 2.0 meter will provide  
29 the following benefits:

- 30
- 31 • Meters will communicate readings at 15-minute intervals (as opposed to the hourly  
32 intervals supplied by AMI 1.0), providing increased data resolution which has the  
33 potential to allow customers to make better consumption decisions.
- 34 • Meters will provide "over-the-air" remote disconnections and reconnections  
35 (currently limited to approximately 1% of customers) to support customer move-in  
36 reconnection, customer move-out disconnection, and vacant premise disconnection.  
37 This feature is expected to result in annual savings of \$2.7M from reduced field visits

1 after all meters are replaced (see medium-term OM&A savings identified below).  
2 Potential savings also include benefits that are more difficult to quantify such as the  
3 customer experience of a more rapid response to customer  
4 disconnections/reconnections and a reduction in the accumulation of charges that  
5 may occur between the time a customer is eligible for disconnect and the time a  
6 customer is disconnected.

- 7 • Meters will incorporate enhanced security and be based on Wi-Sun standards-based  
8 hardware and software enabling future interoperability between systems and devices  
9 allowing for compatibility and functionality for various devices and platforms used by  
10 customers and utilities.

#### 11 12 Medium Term

13 In the medium term, upon the completion of mass deployment of meters and network  
14 equipment at the end of 2028, the AMI 2.0 system will:

- 15  
16 • Provide advanced voltage monitoring capability for the entire network (e.g., voltage  
17 sag, swell, and register);
- 18 • Provide network coverage to an approximately 25,000 additional customers as a  
19 result of operating at 900 MHz frequency with dynamic bandwidth control (see  
20 Interrogatory Response B3-CME-017);
- 21 • Provide an expected annual OM&A savings of approximately \$6.3M (see DSP Section  
22 3.8, p.30). Annual savings arise from reduced manual meter reading (through  
23 improvements in network reach and reliability); reduced network costs (through a  
24 reduction in telecom circuits associated with a reduction in the number of regional  
25 collectors); reduced IT management costs (through the reduction in the number of  
26 Head End Systems (HES)), and reduced field visits (associated with remote  
27 disconnect/reconnect capability); and
- 28 • Provide the foundational platform (advanced meters, high bandwidth  
29 communication network, and HES) to respond to future customer needs and enable  
30 longer term benefits.

#### 31 32 Long-Term

33 AMI 2.0 capabilities expected to be deployed in the longer term (post-mass deployment) are  
34 described in interrogatory response B3-STAFF-105 and include features such as: Load  
35 Disaggregation/Information Services to customers, In-home automation for Customer  
36 Conservation and Demand Response, Locational Awareness, Advanced Grid Monitoring, and  
37 Distributed Energy Resource Management. Once enabled, these features unlock the potential  
38 for a range of savings to customers.

1        *Load Disaggregation/Information Services to Customers* provides customers with additional  
2        insights and greater visibility in near real-time, which allows them to manage their energy  
3        consumption and reduce their bill. The industry is starting to recognize the value of reporting  
4        emission reductions to consumers, and it is expected that future load disaggregation tools  
5        will be capable of providing this information.

6  
7        *In-Home Automation for Customer Energy Conservation and Demand Response* provides a  
8        convenient way for customers to use electricity more efficiently and facilitates the ability for  
9        customers to respond to market signals (TOU price signals and other future demand response  
10       signals), offering them choice and control over their electricity bill.

11  
12       The AMI 2.0 system is also a key enabler for *Distributed Energy Resource Management*  
13       because it offers the capability to monitor and control distributed energy resources for the  
14       safe and reliable operation of the evolving distribution network. This is key to allowing  
15       consumers to make the shift towards becoming prosumers and participating in future energy  
16       markets, thus affording them the opportunity to save money and realize their carbon  
17       reduction goals.

18  
19       Plans to enable these longer-term capabilities providing higher and new levels of customer  
20       service, improved distribution operations, and increased sustainability will be executed using  
21       prudent stage gate/governance processes including stages for proofs of concept, pilots,  
22       business cases, and requisite approvals.