Empirical Research in Support of Incentive Rate-Setting: 2020 Benchmarking Update

Report to the Ontario Energy Board

August 2021

Pacific Economics Group Research, LLC

Empirical Research in Support of Incentive Rate-Setting: 2020 Benchmarking Update

Report to the Ontario Energy Board

August 2021

Dave Hovde, M.S.
Vice President

Matt Makos
Consultant II

PACIFIC ECONOMICS GROUP RESEARCH, LLC
44 East Mifflin, Suite 601
Madison, Wisconsin USA 53703
608.257.1522 608.257.1540 Fax

TABLE OF CONTENTS

1. Introduction

In 2013, the Ontario Energy Board (OEB) issued a report titled "Rate Setting Parameters and Benchmarking under the Renewed Regulatory Framework for Ontario's Electricity Distributors"[1] (Board Report) in which it set forth the framework for setting rate adjustment formulas for local distribution companies (LDCs or "distributors"). The Board Report provides the OEB's final determination on its policies and approaches to the distributor rate adjustment parameters and the benchmarking of electricity distributor total cost performance. This 2020 Benchmarking Update determines the 2021 stretch factor assignments for distributors in relation to the 2022 rate year.

According to the Board Report, rates will be indexed by a formula "which is used to adjust the distribution rates to reflect expected growth in the distributors' input prices (the inflation factor) less allowance for appropriate rates of productivity and efficiency gains (the X-factor)."[2] The productivity part of the X-Factor is the same for all LDCs. The efficiency gains part of the X-Factor is called the stretch factor and can vary by company. This stretch factor reflects the potential for incremental productivity gains by a given LDC under incentive regulation (i.e., incentive rate mechanism or IRM) which in turn depends on an individual distributor's level of cost efficiency.

These stretch factor assignments are based on the results of a statistical cost benchmarking study designed to make inferences on individual distributors' cost efficiency. An econometric model is used to predict the level of cost associated with each distributor's operating conditions. Distributors that had actual cost that was lower than that predicted by the model were assigned lower stretch factors than those that did not. The October 18, 2013 report by Pacific Economics Group (PEG) titled "Productivity and Benchmarking Research in Support of Incentive Rate Setting in Ontario" describes the model used to produce the benchmarking results. The work was subsequently updated to include 2013 data in July of 2014[3] and has been updated

[1] Issued on November 21, 2013 and corrected on December 4, 2013.

[2] Board Report, page 5.

[3] "Empirical work in Support of Incentive Rate Setting: 2013 Benchmarking Update".

each year since. This report presents updated benchmarking results that incorporates 2020 data to update the stretch factors.

Section 2 of this report discusses the methodology used for the 2020 update. Section 3 discusses the data used. Section 4 presents the benchmarking results and updated stretch factors. Section 5 discusses additional resources available to distributors to validate the results contained in this report.

2. Benchmarking Methodology

The model used to determine the cost efficiency of distributors is based on econometrics. Distributor cost in this model is estimated as a function of business conditions faced by each distributor. These business conditions include the number of customers served and the price of inputs such as labor and capital. The parameters of this model establish the relationship between each business condition and distributor cost. These parameters were estimated using Ontario distributor data from 2002-2012.

The model can make a prediction of each distributor's cost given its business conditions by multiplying the company's business condition variables by the model parameters and summing the results[4]. The distributor's actual cost is then compared to that predicted by the model. The percentage difference between actual and predicted cost is the measure of cost performance. Companies with larger negative differences between actual and predicted costs are considered to be better cost performers and therefore eligible for lower stretch factors. A

[4] The table of parameters published in the PEG report was for the full sample. When making predictions of cost for each company, the econometric program estimated the model without including the subject of benchmarking in the sample. Therefore, there exist 59 different sets of parameters which are very similar to each other. For ease of presentation, the PEG report did not present the parameters specific to each distributor. These company-specific parameters are necessary for the calculations and are contained within the working papers associated with this report.

detailed description of the econometric model including estimation technique and other technical details are contained in sections 6 and A2.1 of the PEG report.

The econometric model used to obtain the updated stretch factors is identical to the model described in the PEG report. The OEB intentionally decided not to update the parameters of the econometric model to include future data. The goal was to establish a fixed benchmark that would allow distributors a fair opportunity to demonstrate continuous improvement of cost performance and earn a lower stretch factor. The parameters from the previous model were combined with each company's data – including 2013-2020 data - to produce 2020 predicted cost. The rationale for this decision is discussed in the Board Report and in a memorandum by PEG.[5]

To apply the 2020 values to the model parameters, the data must be transformed to be consistent with how the data were specified for the estimated econometric model. One example of a transformation is that many of the explanatory variables were expressed as logarithms prior to the model being estimated. The PEG report describes the details of the estimation process in section A2.1. The spreadsheet model and associated documentation discussed in section 5 contain the calculations leading to the cost benchmarking results.

The purpose of the benchmarking work is to evaluate the total cost incurred by each distributor. Table 1 shows the formulas used to calculate the measure of total cost used in PEG's benchmarking analysis. As described in the PEG benchmarking report, adjustments were undertaken with the purpose of standardizing cost to facilitate more accurate cost comparisons among distributors. These adjustments included the treatment of high voltage and low voltage costs.

The variables used to explain total cost are the same as in the previous PEG report. They include outputs such as customers, kWh deliveries, and capacity. Prices for capital and OM&A along with other business conditions such as customer growth and average length of lines are also included. A complete discussion of the explanatory variables can be found in section 6 of the PEG report and the supporting documents to this report discussed in section 5. The explanatory variables are used to explain the level of cost incurred by each LDC. Cost that is not explained by the variables is deemed to be due to management performance.

[5] Available on the OEB website in the file "PEG_Memorandum_OEB on_corrections_20131220.pdf"

3. Benchmarking Data

The source of the cost and output data used in the calculations is from the distributors as reported in the reporting and record-keeping requirements (RRR) filings. The study assumes that the data as reported by the distributors conforms to accounting policies and procedures described in the Accounting Procedures Handbook for Electricity Distributors that includes the Uniform System of Accounts and other instructions contained within the RRR filing system. It is also assumes that the LDCs have taken ownership of the data provided to the OEB and significant revisions are not anticipated.[6]

Data sources apart from the RRR are related to input prices. OEB-approved rates of return were obtained from OEB Staff. The source for other input price data was Statistics Canada. The input price indexes used were the same as those used in PEG's original study with one exception. Statistics Canada no longer calculates the Electric Utility Construction Price Index (EUCPI). The growth in the GDPIPI (FDD) was used to escalate the EUCPI values used in the calculations.[7]

The update was done in the same manner as the original work with an exception. The OEB has improved the quality of the guidance given to distributors related to capital additions data. As a result, improved data are available for 2013-2020. PEG has accordingly relied upon these more recently available capital additions data filed in the RRRs instead of inferring these data from changes in gross plant.

The calculations have also been adjusted for amalgamations that have taken place since the original study was done. The historical cost performance of the combined entity was

[6] The Ontario Energy Board (OEB) released the Report of the Board on Performance Measurement for Electricity Distributors: A Scorecard Approach (EB-2010-0379) on March 5, 2014. This report states that: '*While the Board will create consistent Scorecard reports for distributors, ownership of the data and Scorecard resides with the distributor.'*

[7] GDPIPI (FDD) is the Gross Domestic Product Implicit Price Index for Final Domestic Demand.

calculated from the historical results of the predecessor distributors that were amalgamated or acquired.[8] There were no amalgamations in 2020 that altered the number of distributors available to be benchmarked. However, Hydro One Networks acquired Orillia Power Distribution and Peterborough Distribution which continued to separately provide the data needed for benchmarking. Results were calculated for all three distributors. A separate calculation was performed to benchmark all three as a single distributor. Both calculations resulted in the same stretch factor for Hydro One. Details of this alternate calculation are available in calculations file accompanying this report.

This report also addresses the impact of data revisions by LDCs for informational purposes only. The OEB requires distributors to be accountable for the integrity of their reported data. As part of its procedures to improve data quality, the OEB invited distributors to submit corrections to previously provided data. However, a key determination is that already established and published benchmarking results for prior years would not be modified as a result of the new data. This includes any year that comprised the three-year average used to determine the current year's stretch factor. As stretch factors are used directly to set the distribution rates of distributors, they are not subsequently adjusted to avoid retroactive rate setting (i.e., rates are final once set unless approved on an interim basis). Consequently, the three years of data used to derive the three-year average for any year's stretch factors are locked-in such that the underlying data used do not change due to any subsequent data revisions. [9]

However, to show the impacts of data changes on the stretch factors, revised data have been incorporated into the benchmarking databases and model to allow previous results to be recalculated. The revised 2019 and 2018 results are presented only for the purposes of showing

[8] The method used to calculation the hypothetical historical cost performance of the combined entity is to sum the actual costs, sum the costs predicted by the model, and calculate the percentage difference. This method is essentially a cost-weighted average of the historical cost performances of the amalgamated distributors.

[9] The previous results were "locked-in" by pasting the values of previous cost performance into the current calculations worksheet. This means that these values will not be affected by subsequent data revisions. This allows for the calculation of a new three-year average of the new 2020 result consistent with the previously published 2018 and 2019 results while still allowing the calculation of revised results for previous years, if applicable, to show the impact of any data revision.

the impact of the data changes but were not used as discussed above to calculate the new 2018-2020 average cost performance used to determine the 2021 stretch factors assignments.

Several tables are included at the end of this report. Table 1 describes the calculation of total cost. Table 2 shows each distributor's growth in total cost from 2019 to 2020. Table 3 (A) presents the 2020 benchmarking results and a comparison to prior years' results. Table 3 (B) summarizes data revision impacts on cost performance although they have no bearing on the derivation of the current stretch factors. Table 4 presents average cost performance and associated stretch factors. Table 5 presents the companies assigned to each cohort according to their updated stretch factors. Changes from the previous year's assignments are shown in bold.

The goal of the benchmarking work is to evaluate levels of distributor cost. Table 2 presents the actual OM&A, Capital, and Total cost for each distributor for 2019 and 2020. As can be seen, industry total cost decreased by 0.93% on average from 2019-2020. Whereas OM&A cost grew on average by 1.30%, capital cost declined on average by 3.14%. The decline in capital cost can be partially attributed to a decline in the allowed rate of return on capital.

The econometric model estimates LDCs' costs as a function of distributor output, input price growth, and other business condition variables beyond management control. It will also produce a prediction of the level of cost consistent with these business conditions and thus "explain" some of the observed cost level. As described in the PEG benchmarking report, changes not accounted for by these factors are deemed to be due to management performance. The parameter estimates measure the cost impact of the different business conditions and are presented on Table 16 of the PEG benchmarking report. The discussion below provides some details about the parameters and their associated impacts established for the 2002 to 2012 period.

The first of the cost drivers is output quantity. The model uses three measures for the quantity of distributor output. The first is the number of customers served and the second is kWh delivered. The third is a proxy for the capacity of the distribution system. The capacity variable is described in the PEG report and is equal to the largest peak load experienced as of the current year of data. For example, the 2012 value for the capacity variable is equal to largest reported system summer or winter kW in all the years 2002-2012. Therefore, for 2013, this capacity variable only increased if the distributor's kW demand in that year exceeded kW demand in every year between 2002 and 2012. Of the three output variables, the model estimates that the

number of customers has the largest impact on cost, followed by the system capacity variable. The kWh delivered was the least important of the output variables. For the average company, the number of customers was found to be a more important cost driver than the other two combined. For each 1% change in number of customers, cost was estimated to change by 0.44%.

The second group of cost drivers were the input prices for capital and OM&A. For the average company, the cost impact of changes in the capital price was found to be almost twice as important as that for OM&A. For every 1% change in capital price, the impact on total cost was about 0.63%. The corresponding impact for changes in the OM&A price was 0.37%. The relevant indexes were updated to include 2020 data. For the OM&A price, the growth in average weekly earnings and that for the GDP implicit price index for final domestic demand ("GDPIPI (FDD)") were calculated. The 2020 growth in the OM&A price index is calculated as 70% times average weekly earnings growth plus 30% times GDPIPI (FDD) growth. The 2019 values for the OM&A price index from the previous report were escalated by the growth that occurred in 2020.

It is worth noting that the increase in average weekly earnings was higher from 2019 to 2020 (+7%) than earlier years. If this was due to the pandemic temporarily removing lower paid workers from the workforce, one should expect this to reverse at some point in the future. To the extent that labor price inflation is temporarily elevated, this will have the effect of increasing the level of cost predicted by the model and cause better distributor cost performance. The opposite effect is expected should future labor price growth be depressed. Because the stretch factors are based on three-year averages of cost performance, the effect of a temporary increase in labor prices is mitigated by the inclusion of two years with more typical price growth.

The capital price calculation is based upon an asset price index, an economic depreciation rate, and a rate of return. The asset price index was the Electric Utility Construction Price Index as calculated by Statistics Canada. As this index is no longer available, the previous values are escalated by an alternate index. The index chosen was the GDPIPI (FDD) which is the same index used to represent all non-labour price inflation in the Board-approved inflation measure formula[10]. The depreciation rate is fixed at 4.59% consistent with the previous work. The rate of return is a weighted average of the rates for return on equity, long-term debt, and short-term debt

[10] The weight given to the non-labour index in the inflation formula includes capital cost.

as approved by the OEB. The capital price used to calculate total cost is also used as an explanatory variable. Therefore, any changes in the rate of return or asset price index that affect the cost calculation will also affect the price calculation which will in turn "explain" the observed changes in cost.

The last group of cost drivers consists of other business condition variables. The first was the percentage of customers added over the last ten years. The second was the average km of distribution line. For each 1% change in line length, total cost was estimated to increase by 0.29%. The model also contains a time trend that accounts for changes in cost over time that are not accounted for by the other cost drivers. This variable estimates that cost should rise by 1.7% per year for reasons not identified by other variables in the model. All of these business condition variables were updated to include 2020 data.

4. Benchmarking Results and Updated Stretch Factors

Table 3 (A) presents a summary of the current benchmarking results for each distributor from 2017-2020. The updated average cost performance is based on a three-year rolling average calculated from the 2018-2020 values and is used to assign updated stretch factors to distributors. The last column presents the difference between the updated average cost performance and the previous one (2017-2019).[11] The electricity distributor sector has shown consistent year-over-year cost performance improvements. The average level of cost performance in 2020 for the 59 distributors is 11.3% lower than forecast (or predicted) cost that builds upon cost performance improvement in previous years. Previous years also have shown performance improvements for the currently benchmarked distributors but not as good compared recent years.

[11] Changes in average cost performance are due to not only the addition of 2020 results, but the removal of 2017 results. It is therefore possible to simultaneously have improved 2020 cost performance and deteriorating average performance.

As discussed above, the OEB requires distributors to be accountable for the integrity of their reported data and sets out reporting procedures to improve data quality. OEB Staff reviewed and approved distributors' data corrections requests to previously filed data when reasonable justification is provided. The revised data were incorporated into the benchmarking databases and the 2018 and 2019 results were recalculated to demonstrate the impact on the previously published 2017-2019 average cost performance. Table 3 (B) shows the impact of LDC data revisions on 2018 and 2019 cost performance for those companies that had approved changes since the previous update[12]. No revisions would have changed previously determined cohort placement.

Updated stretch factors are assigned based on a three-year average of actual less predicted cost over the 2018-2020 period. As discussed in the Board Report, distributors that averaged 25% or more below cost received the lowest stretch factor of 0%. Those that averaged in excess of 10% and up to 25% below cost received a stretch factor of 0.15%. Those within 10% of predicted cost received a stretch factor of 0.30%. Those distributors that had cost in excess of 10% and up to 25% of that predicted received a stretch factor of 0.45%. Any distributors that had cost in excess of 25% more than predicted were assigned the highest stretch factor of 0.60%.

Table 4 presents a summary of the current and previous years' cost performance results and corresponding stretch factors. The assigned stretch factor for most companies was not affected by the 2020 update. A total of four companies have been assigned different stretch factors and all four now have lower stretch factors. Table 5 presents the updated stretch factor assignments in the format of Appendix D of the Board report.

5. Validation and Other Supporting Documents

As part of their reporting requirements, distributors are asked to validate the numbers contained in their scorecard. The Spreadsheet Model as updated produces the updated benchmarking results contained in this report. It builds on the previous version by adding additional worksheets related to the 2020 calculations.

[12] There were no accepted revisions to 2017 data since the previous update.

The format of the additional worksheets used in the update are similar to those provided earlier and the User's Guide will be applicable to the new worksheets. The guide is intended to serve as a tool for distributors to better understand these calculations and their cost performance. The spreadsheet model and users guide are available in the Total cost benchmarking – updates section of the Performance Assessment page on the OEB's website.

Table 1

Calculation of 2020 Total Cost

Variable		Reference	Formula	Source
Total Cost			= OM&A + Capital Cost	Formula
OM&A			= A+B+C+D+E+F+G-I+J	Formula
2020	Operation	A		RRR
2020	Maintenance	B		RRR
2020	Billing and Collection	C		RRR
2020	Community Relations	D		RRR
2020	Administrative and General Expenses	E		RRR
2020	Insurance Expense	F		RRR
2020	Advertising Expenses	G		RRR
Adjustments to OM&A				
2020	HV Adjustment	I		RRR
2020	LV Adjustment	J		Hydro One Networks
Capital				
2019	Asset Price Index	K		Previous Year Calculations
2019	Capital Quantity	M		Previous Year Calculations
2020	Asset Price Index	O	=K x (GDPPI-FDD 2020 / GDPPI-FDD 2019)	Formula, Statistics Canada
2020	Capital Additions	P		RRR
2020	HV Capital Additions	Q		RRR
2020	Quantity of Capital Additions	R	=(P-Q) / O	Formula
	Depreciation Rate	S	Fixed at 4.59% for All Years	PEG Report for 4GIR
2020	Capital Quantity	T	= M - S x M + R	Formula
2020	Rate of Return	U		OEB Decision
2020	Capital Price	V	=U x K + S x O	Formula
2020	Capital Cost	W	= V x T	Formula

Table 2

Total Cost by Distributor: 2019 vs. 2020

	OM&A Cost			Capital Cost			Total Cost		
	2019	2020	Percent Change	2019	2020	Percent Change	2019	2020	Percent Change
Alectra Utilities Corporation	257,552,392	246,360,016	-4.44%	497,115,696	482,435,863	-3.00%	754,668,089	728,795,879	-3.49%
Algoma Power Inc.	11,990,934	13,122,891	9.02%	14,233,881	13,699,275	-3.83%	26,224,815	26,822,166	2.25%
Atikokan Hydro Inc.	1,083,377	1,110,089	2.44%	602,858	561,793	-7.05%	1,686,235	1,671,883	-0.85%
Bluewater Power Distribution Corporation	13,313,535	12,871,965	-3.37%	13,641,782	13,356,760	-2.11%	26,955,317	26,228,724	-2.73%
Brantford Power Inc.	9,851,841	11,056,986	11.54%	11,698,662	12,368,681	5.57%	21,550,503	23,425,667	8.34%
Burlington Hydro Inc.	19,043,936	19,760,560	3.69%	26,038,314	25,163,397	-3.42%	45,082,250	44,923,958	-0.35%
Canadian Niagara Power Inc.	10,005,216	9,416,459	-6.06%	16,301,129	16,367,735	0.41%	26,306,344	25,784,193	-2.00%
Centre Wellington Hydro Ltd.	2,602,317	2,465,654	-5.39%	2,628,436	2,452,597	-6.92%	5,230,753	4,918,251	-6.16%
Chapleau Public Utilities Corporation	819,048	824,639	0.68%	236,825	224,680	-5.26%	1,055,873	1,049,319	-0.62%
Cooperative Hydro Embrun Inc.	691,107	730,185	5.50%	516,778	501,878	-2.93%	1,207,886	1,232,062	1.98%
E.L.K. Energy Inc.	2,787,808	2,416,767	-14.28%	2,428,307	2,377,429	-2.12%	5,216,115	4,794,196	-8.43%
Energy+ Inc.	18,361,849	18,601,179	1.29%	26,671,125	25,608,031	-4.07%	45,032,974	44,209,209	-1.85%
Entegrus Powerlines Inc.	13,298,368	13,263,123	-0.27%	20,560,306	20,234,041	-1.60%	33,858,674	33,497,164	-1.07%
EnWin Utilities Ltd.	24,432,745	25,310,135	3.53%	39,064,214	37,056,688	-5.28%	63,496,959	62,366,823	-1.80%
Elexicon Energy Inc.	40,136,684	40,002,781	-0.33%	68,419,347	66,700,666	-2.54%	108,556,031	106,703,447	-1.72%
EPCOR Electricity Distribution Ontario Inc.	6,529,883	6,144,806	-6.08%	4,953,086	4,915,178	-0.77%	11,482,969	11,059,984	-3.75%
ERTH Power Corporation	7,261,722	7,273,017	0.16%	8,903,938	8,737,695	-1.88%	16,165,660	16,010,712	-0.96%
Espanola Regional Hydro Distribution Corporation	1,709,667	1,605,579	-6.28%	798,526	777,752	-2.64%	2,508,193	2,383,331	-5.11%
Essex Powerlines Corporation	7,356,413	7,805,877	5.93%	10,269,224	9,903,134	-3.63%	17,625,637	17,709,011	0.47%
Festival Hydro Inc.	5,855,853	6,002,784	2.48%	8,034,350	7,611,894	-5.40%	13,890,203	13,614,678	-2.00%
Fort Frances Power Corporation	1,629,256	1,565,266	-4.01%	931,036	899,994	-3.39%	2,560,292	2,465,260	-3.78%
Greater Sudbury Hydro Inc.	14,566,546	14,709,333	0.98%	17,850,661	17,354,767	-2.82%	32,417,207	32,064,100	-1.10%
Grimsby Power Incorporated	3,151,551	3,388,617	7.25%	3,758,286	3,604,656	-4.17%	6,909,837	6,993,273	1.20%
Halton Hills Hydro Inc.	6,215,697	6,452,824	3.74%	12,189,535	11,687,867	-4.20%	18,405,232	18,140,691	-1.45%
Hearst Power Distribution Company Limited	1,086,335	1,089,704	0.31%	368,522	353,090	-4.28%	1,454,857	1,442,794	-0.83%
Hydro 2000 Inc.	506,164	584,260	14.35%	152,566	148,207	-2.90%	658,731	732,466	10.61%
Hydro Hawkesbury Inc.	991,638	1,090,445	9.50%	613,884	579,723	-5.73%	1,605,522	1,670,167	3.95%
Hydro One Networks Inc.	538,618,195	525,977,906	-2.37%	874,005,188	867,736,323	-0.72%	1,412,623,382	1,393,714,229	-1.35%
Hydro Ottawa Limited	78,332,371	80,181,186	2.33%	170,827,554	167,096,745	-2.21%	249,159,924	247,277,931	-0.76%
Innpower Corporation	5,765,661	6,121,413	5.99%	10,012,926	10,303,063	2.86%	15,778,587	16,424,476	4.01%
Kingston Hydro Corporation	6,960,489	7,017,165	0.81%	8,971,880	8,555,764	-4.75%	15,932,369	15,572,929	-2.28%
Kitchener-Wilmot Hydro Inc.	17,521,849	18,911,859	7.63%	33,707,186	32,485,556	-3.69%	51,229,035	51,397,415	0.33%
Lakefront Utilities Inc.	2,618,296	2,668,436	1.90%	2,660,380	2,649,011	-0.43%	5,278,677	5,317,447	0.73%
Lakeland Power Distribution Ltd.	4,991,820	5,188,177	3.86%	5,058,682	4,823,179	-4.77%	10,050,502	10,011,356	-0.39%
London Hydro Inc.	37,864,464	38,287,946	1.11%	53,390,903	52,935,175	-0.86%	91,255,367	91,223,121	-0.04%
Milton Hydro Distribution Inc.	9,936,414	10,485,033	5.37%	18,354,678	17,619,204	-4.09%	28,291,092	28,104,237	-0.66%
Newmarket-Tay Power Distribution Ltd.	12,351,094	11,873,565	-3.94%	17,444,218	16,569,447	-5.14%	29,795,312	28,443,012	-4.64%
Niagara Peninsula Energy Inc.	18,348,752	18,278,751	-0.38%	25,695,030	24,908,996	-3.11%	44,043,783	43,187,747	-1.96%
Niagara-on-the-Lake Hydro Inc.	2,774,720	2,911,179	4.80%	4,466,080	4,308,622	-3.59%	7,240,800	7,219,801	-0.29%
North Bay Hydro Distribution Limited	6,567,534	6,656,816	1.35%	11,154,005	10,718,413	-3.98%	17,721,539	17,375,228	-1.97%
Northern Ontario Wires Inc.	2,790,464	2,775,792	-0.53%	1,483,588	1,409,058	-5.15%	4,274,052	4,184,850	-2.11%
Oakville Hydro Electricity Distribution Inc.	17,906,962	18,103,232	1.09%	35,941,071	34,580,796	-3.86%	53,848,033	52,684,028	-2.19%
Orangeville Hydro Limited	3,419,294	3,189,463	-6.96%	3,763,494	3,606,292	-4.27%	7,182,788	6,795,755	-5.54%
Orillia Power Distribution Corporation	4,906,135	5,937,171	19.07%	4,807,450	4,612,940	-4.13%	9,713,585	10,550,111	8.26%
Oshawa PUC Networks Inc.	12,607,249	12,083,296	-4.24%	22,784,128	22,293,683	-2.18%	35,391,377	34,376,979	-2.91%

Table 2

Total Cost by Distributor: 2019 vs. 2020

	OM&A Cost			Capital Cost			Total Cost		
	2019	2020	Percent Change	2019	2020	Percent Change	2019	2020	Percent Change
Ottawa River Power Corporation	3,337,203	3,468,416	3.86%	2,666,141	2,484,957	-7.04%	6,003,344	5,953,373	-0.84%
Peterborough Distribution Incorporated	8,467,413	9,197,488	8.27%	13,382,600	12,489,194	-6.91%	21,850,013	21,686,682	-0.75%
PUC Distribution Inc.	10,740,394	10,623,175	-1.10%	12,709,727	12,100,328	-4.91%	23,450,122	22,723,503	-3.15%
Renfrew Hydro Inc.	1,355,865	1,411,561	4.03%	1,269,531	1,207,746	-4.99%	2,625,396	2,619,307	-0.23%
Rideau St. Lawrence Distribution Inc.	2,242,574	2,215,871	-1.20%	1,206,954	1,169,180	-3.18%	3,449,528	3,385,051	-1.89%
Sioux Lookout Hydro Inc.	1,546,224	1,495,093	-3.36%	929,922	919,915	-1.08%	2,476,146	2,415,008	-2.50%
Synergy North Corporation	16,857,004	15,980,377	-5.34%	21,435,307	20,471,244	-4.60%	38,292,311	36,451,621	-4.93%
Tillsonburg Hydro Inc.	2,767,763	2,794,063	0.95%	2,565,809	2,571,495	0.22%	5,333,572	5,365,559	0.60%
Toronto Hydro-Electric System Limited	253,196,236	254,882,858	0.66%	652,375,141	647,906,436	-0.69%	905,571,377	902,789,294	-0.31%
Wasaga Distribution Inc.	3,432,078	3,505,519	2.12%	3,120,995	3,031,566	-2.91%	6,553,073	6,537,086	-0.24%
Waterloo North Hydro Inc.	13,878,886	13,591,305	-2.09%	34,310,088	32,994,597	-3.91%	48,188,974	46,585,903	-3.38%
Welland Hydro-Electric System Corp.	6,757,918	6,580,466	-2.66%	5,352,055	5,294,378	-1.08%	12,109,973	11,874,844	-1.96%
Wellington North Power Inc.	1,806,902	1,856,980	2.73%	1,436,725	1,420,412	-1.14%	3,243,627	3,277,392	1.04%
Westario Power Inc.	5,927,808	5,997,247	1.16%	8,361,826	8,097,246	-3.22%	14,289,635	14,094,493	-1.38%
Average			1.30%			-3.14%			-0.93%
Median			1.09%			-3.42%			-1.10%

Table 3 (A)

Summary of Cost Performance Results

	Cost Efficiency Assessment						
	2017	2018	2019	2020	2017-2019	2018-2020	Difference from 2017-2019
Alectra Utilities Corporation	4.1%	-0.8%	0.1%	-4.4%	1.2%	-1.7%	-2.8%
Algoma Power Inc.	68.9%	66.1%	64.3%	61.9%	66.4%	64.1%	-2.3%
Atikokan Hydro Inc.	12.6%	9.6%	6.6%	2.8%	9.6%	6.3%	-3.3%
Bluewater Power Distribution Corporation	4.0%	3.7%	0.3%	-4.5%	2.7%	-0.2%	-2.8%
Brantford Power Inc.	-8.2%	-9.4%	-10.2%	-4.8%	-9.3%	-8.1%	1.1%
Burlington Hydro Inc.	-11.9%	-13.9%	-11.7%	-13.0%	-12.5%	-12.9%	-0.4%
Canadian Niagara Power Inc.	11.2%	17.1%	15.6%	11.0%	14.6%	14.6%	-0.1%
Centre Wellington Hydro Ltd.	1.0%	-0.3%	-1.1%	-11.2%	-0.1%	-4.2%	-4.1%
Chapleau Public Utilities Corporation	17.0%	24.2%	25.4%	18.9%	22.2%	22.8%	0.6%
Cooperative Hydro Embrun Inc.	-41.1%	-44.8%	-51.3%	-54.7%	-45.7%	-50.3%	-4.6%
E.L.K. Energy Inc.	-44.5%	-47.8%	-47.4%	-59.0%	-46.6%	-51.4%	-4.8%
Elexicon Energy Inc.	-2.8%	-5.5%	-1.0%	-4.3%	-3.1%	-3.6%	-0.5%
Energy+ Inc.	-11.1%	-13.1%	-14.1%	-14.4%	-12.8%	-13.9%	-1.1%
Entegrus Powerlines Inc.	-16.8%	-16.0%	-21.0%	-25.4%	-17.9%	-20.8%	-2.9%
ENWIN Utilities Ltd.	5.3%	-2.7%	-10.1%	-15.3%	-2.5%	-9.4%	-6.9%
EPCOR Electricity Distribution Ontario Inc.	-18.4%	-19.3%	-3.9%	-9.8%	-13.9%	-11.0%	2.9%
ERTH Power Corporation	11.2%	6.6%	1.3%	-1.5%	6.4%	2.1%	-4.2%
Espanola Regional Hydro Distribution Corporation	-23.1%	-24.8%	-17.2%	-25.5%	-21.7%	-22.5%	-0.8%
Essex Powerlines Corporation	-14.1%	-12.3%	-19.2%	-23.8%	-15.2%	-18.4%	-3.2%
Festival Hydro Inc.	8.8%	10.8%	5.9%	1.6%	8.5%	6.1%	-2.4%
Fort Frances Power Corporation	2.4%	-0.8%	-5.1%	-11.4%	-1.2%	-5.7%	-4.6%
Greater Sudbury Hydro Inc.	7.1%	7.6%	5.1%	3.0%	6.6%	5.3%	-1.4%
Grimsby Power Incorporated	-24.9%	-27.6%	-31.8%	-34.5%	-28.1%	-31.3%	-3.2%

Table 3 (A)

Summary of Cost Performance Results

	Cost Efficiency Assessment						
	2017	2018	2019	2020	2017-2019	2018-2020	Difference from 2017-2019
Halton Hills Hydro Inc.	-28.4%	-29.2%	-30.3%	-33.8%	-29.3%	-31.1%	-1.8%
Hearst Power Distribution Company Limited	-20.1%	-21.3%	-28.7%	-31.6%	-23.4%	-27.2%	-3.8%
Hydro 2000 Inc.	-23.0%	-15.4%	-22.4%	-18.0%	-20.3%	-18.6%	1.7%
Hydro Hawkesbury Inc.	-56.3%	-57.7%	-69.3%	-66.4%	-61.1%	-64.4%	-3.4%
Hydro One Networks Inc.	17.0%	16.0%	16.3%	16.1%	16.4%	16.2%	-0.3%
Hydro Ottawa Limited	16.5%	18.2%	20.4%	19.8%	18.4%	19.5%	1.1%
Innpower Corporation	4.7%	-2.2%	-5.3%	-6.8%	-0.9%	-4.8%	-3.8%
Kingston Hydro Corporation	-1.4%	1.3%	-3.8%	-6.8%	-1.3%	-3.1%	-1.8%
Kitchener-Wilmot Hydro Inc.	-19.9%	-19.2%	-21.1%	-22.1%	-20.1%	-20.8%	-0.7%
Lakefront Utilities Inc.	-23.5%	-21.0%	-24.4%	-27.2%	-23.0%	-24.2%	-1.2%
Lakeland Power Distribution Ltd.	-16.1%	-9.2%	-14.2%	-16.9%	-13.2%	-13.4%	-0.2%
London Hydro Inc.	-7.1%	-5.9%	-5.8%	-6.3%	-6.2%	-6.0%	0.3%
Milton Hydro Distribution Inc.	-14.4%	-17.4%	-18.7%	-23.7%	-16.8%	-19.9%	-3.1%
Newmarket-Tay Power Distribution Ltd.	-8.6%	-10.0%	-9.8%	-15.9%	-9.5%	-11.9%	-2.4%
Niagara Peninsula Energy Inc.	4.9%	1.3%	1.1%	-2.8%	2.4%	-0.1%	-2.6%
Niagara-on-the-Lake Hydro Inc.	-9.2%	-5.2%	-9.5%	-12.7%	-8.0%	-9.1%	-1.2%
North Bay Hydro Distribution Limited	5.5%	3.3%	4.9%	1.4%	4.6%	3.2%	-1.4%
Northern Ontario Wires Inc.	-36.0%	-37.3%	-38.2%	-42.1%	-37.2%	-39.2%	-2.0%
Oakville Hydro Electricity Distribution Inc.	2.6%	1.0%	0.3%	-3.8%	1.3%	-0.8%	-2.1%
Orangeville Hydro Limited	-14.3%	-20.0%	-20.7%	-28.8%	-18.3%	-23.1%	-4.8%
Orillia Power Distribution Corporation	-3.8%	-5.7%	-7.4%	-1.9%	-5.6%	-5.0%	0.7%
Oshawa PUC Networks Inc.	-16.3%	-14.4%	-12.0%	-16.6%	-14.2%	-14.4%	-0.1%
Ottawa River Power Corporation	-10.4%	-21.9%	-18.9%	-24.3%	-17.0%	-21.7%	-4.6%

Table 3 (A)

Summary of Cost Performance Results

	Cost Efficiency Assessment						
	2017	2018	2019	2020	2017-2019	2018-2020	Difference from 2017-2019
Peterborough Distribution Incorporated	8.2%	5.8%	1.5%	-0.6%	5.2%	2.2%	-2.9%
PUC Distribution Inc.	11.2%	8.2%	5.5%	1.1%	8.3%	4.9%	-3.4%
Renfrew Hydro Inc.	7.7%	7.2%	1.1%	-2.5%	5.3%	2.0%	-3.4%
Rideau St. Lawrence Distribution Inc.	-4.1%	-9.4%	-11.2%	-15.4%	-8.3%	-12.0%	-3.7%
Sioux Lookout Hydro Inc.	-7.9%	-16.9%	-19.0%	-25.8%	-14.6%	-20.6%	-6.0%
Synergy North Corporation	9.1%	7.4%	6.2%	0.5%	7.6%	4.7%	-2.9%
Tillsonburg Hydro Inc.	-1.2%	3.2%	3.7%	-5.5%	1.9%	0.5%	-1.5%
Toronto Hydro-Electric System Limited	52.9%	53.0%	52.8%	52.9%	52.9%	52.9%	0.0%
Wasaga Distribution Inc.	-45.7%	-46.7%	-42.9%	-46.6%	-45.1%	-45.4%	-0.3%
Waterloo North Hydro Inc.	9.5%	9.7%	8.1%	3.5%	9.1%	7.1%	-2.0%
Welland Hydro-Electric System Corp.	-19.6%	-24.0%	-25.4%	-30.3%	-23.0%	-26.6%	-3.6%
Wellington North Power Inc.	12.7%	8.7%	6.7%	2.9%	9.4%	6.1%	-3.3%
Westario Power Inc.	-1.5%	-8.5%	-7.7%	-11.1%	-5.9%	-9.1%	-3.2%
Average	-4.9%	-6.2%	-7.8%	-11.3%	-6.3%	-8.4%	-2.1%
Median	-3.8%	-5.7%	-7.4%	-11.1%	-5.9%	-8.1%	-2.4%
Max	68.9%	66.1%	64.3%	61.9%	66.4%	64.1%	2.9%
Min	-56.3%	-57.7%	-69.3%	-66.4%	-61.1%	-64.4%	-6.9%

Table 3 (B)

Summary of the Impact of Revised Data on Cost Performance Results

Distributors with approved 2018 and/or 2019 data revisions for the 2020 data update	2017 Cost Performance			2018 Cost Performance			2019 Cost Performance			2017-2019 Average Cost Performance*		
	As Previously Calculated	As Revised	Difference	As Previously Calculated	As Revised	Difference	As Previously Calculated	As Revised	Difference	As Previously Calculated	As Revised	Difference
Bluewater Power Distribution Corporation	4.0%	na	na	3.7%	3.7%	0.00%	0.3%	0.3%	0.03%	2.7%	2.7%	-0.010%
Brantford Power Inc.	-8.2%	na	na	-9.4%	-9.4%	0.00%	-10.2%	-10.1%	-0.15%	-9.3%	-9.2%	0.050%
Burlington Hydro Inc.	-11.9%	na	na	-13.9%	-14.3%	0.44%	-11.7%	-12.1%	0.41%	-12.5%	-12.8%	-0.282%
Entegrus Powerlines Inc.	-16.8%	na	na	-16.0%	-16.0%	0.00%	-21.0%	-21.0%	0.00%	-17.9%	-17.9%	0.000%
Espanola Regional Hydro Distribution Corporation	-23.1%	na	na	-24.8%	-24.8%	-0.01%	-17.2%	-17.2%	0.00%	-21.7%	-21.7%	0.005%
Festival Hydro Inc.	8.8%	na	na	10.8%	10.8%	0.00%	5.9%	5.8%	0.10%	8.5%	8.5%	-0.032%
Hydro Hawkesbury Inc.	-56.3%	na	na	-57.7%	-57.7%	0.00%	-69.3%	-69.3%	0.01%	-61.1%	-61.1%	-0.003%
Lakefront Utilities Inc.	-23.5%	na	na	-21.0%	-21.0%	0.00%	-24.4%	-24.6%	0.16%	-23.0%	-23.0%	-0.053%
Orangeville Hydro Limited	-14.3%	na	na	-20.0%	-20.1%	0.05%	-20.7%	-20.7%	0.01%	-18.3%	-18.3%	-0.020%

* There were no new revisions to 2017 data. The impact of revisions are not cumulative with revisions from previous updates. Entegrus reported account-level OM&A revisions for 2018 that resulted in no change to total OM&A used in the study. Other submitted changes were either not used in the 2018-2019 calculations or resulted in no net change to the amounts being used.

Table 4

Summary of Stretch Factor Assignments

	2017-2019		2018-2020		Change in Stretch Factor
	Benchmarking Performance	Stretch Factor	Benchmarking Performance	Stretch Factor	
Alectra Utilities Corporation	1.2%	0.30	-1.7%	0.30	NO
Algoma Power Inc.	66.4%	0.60	64.1%	0.60	NO
Atikokan Hydro Inc.	9.6%	0.30	6.3%	0.30	NO
Bluewater Power Distribution Corporation	2.7%	0.30	-0.2%	0.30	NO
Brantford Power Inc.	-9.3%	0.30	-8.1%	0.30	NO
Burlington Hydro Inc.	-12.5%	0.15	-12.9%	0.15	NO
Canadian Niagara Power Inc.	14.6%	0.45	14.6%	0.45	NO
Centre Wellington Hydro Ltd.	-0.1%	0.30	-4.2%	0.30	NO
Chapleau Public Utilities Corporation	22.2%	0.45	22.8%	0.45	NO
Cooperative Hydro Embrun Inc.	-45.7%	0.00	-50.3%	0.00	NO
E.L.K. Energy Inc.	-46.6%	0.00	-51.4%	0.00	NO
Elexicon Energy Inc.	-3.1%	0.30	-3.6%	0.30	NO
Energy+ Inc.	-12.8%	0.15	-13.9%	0.15	NO
Entegrus Powerlines Inc.	-17.9%	0.15	-20.8%	0.15	NO
ENWIN Utilities Ltd.	-2.5%	0.30	-9.4%	0.30	NO
EPCOR Electricity Distribution Ontario Inc.	-13.9%	0.15	-11.0%	0.15	NO
ERTH Power Corporation	6.4%	0.30	2.1%	0.30	NO
Espanola Regional Hydro Distribution Corporation	-21.7%	0.15	-22.5%	0.15	NO
Essex Powerlines Corporation	-15.2%	0.15	-18.4%	0.15	NO
Festival Hydro Inc.	8.5%	0.30	6.1%	0.30	NO
Fort Frances Power Corporation	-1.2%	0.30	-5.7%	0.30	NO
Greater Sudbury Hydro Inc.	6.6%	0.30	5.3%	0.30	NO
Grimsby Power Incorporated	-28.1%	0.00	-31.3%	0.00	NO
Halton Hills Hydro Inc.	-29.3%	0.00	-31.1%	0.00	NO

Table 4

Summary of Stretch Factor Assignments

	2017-2019		2018-2020		Change in Stretch Factor
	Benchmarking Performance	Stretch Factor	Benchmarking Performance	Stretch Factor	
Hearst Power Distribution Company Limited	**-23.4%**	**0.15**	**-27.2%**	**0.00**	**YES**
Hydro 2000 Inc.	-20.3%	0.15	-18.6%	0.15	NO
Hydro Hawkesbury Inc.	-61.1%	0.00	-64.4%	0.00	NO
Hydro One Networks Inc.	16.4%	0.45	16.2%	0.45	NO
Hydro Ottawa Limited	18.4%	0.45	19.5%	0.45	NO
Innpower Corporation	-0.9%	0.30	-4.8%	0.30	NO
Kingston Hydro Corporation	-1.3%	0.30	-3.1%	0.30	NO
Kitchener-Wilmot Hydro Inc.	-20.1%	0.15	-20.8%	0.15	NO
Lakefront Utilities Inc.	-23.0%	0.15	-24.2%	0.15	NO
Lakeland Power Distribution Ltd.	-13.2%	0.15	-13.4%	0.15	NO
London Hydro Inc.	-6.2%	0.30	-6.0%	0.30	NO
Milton Hydro Distribution Inc.	-16.8%	0.15	-19.9%	0.15	NO
Newmarket-Tay Power Distribution Ltd.	**-9.5%**	**0.30**	**-11.9%**	**0.15**	**YES**
Niagara Peninsula Energy Inc.	2.4%	0.30	-0.1%	0.30	NO
Niagara-on-the-Lake Hydro Inc.	-8.0%	0.30	-9.1%	0.30	NO
North Bay Hydro Distribution Limited	4.6%	0.30	3.2%	0.30	NO
Northern Ontario Wires Inc.	-37.2%	0.00	-39.2%	0.00	NO
Oakville Hydro Electricity Distribution Inc.	1.3%	0.30	-0.8%	0.30	NO
Orangeville Hydro Limited	-18.3%	0.15	-23.1%	0.15	NO
Orillia Power Distribution Corporation	-5.6%	0.30	-5.0%	0.30	NO
Oshawa PUC Networks Inc.	-14.2%	0.15	-14.4%	0.15	NO
Ottawa River Power Corporation	-17.0%	0.15	-21.7%	0.15	NO
Peterborough Distribution Incorporated	5.2%	0.30	2.2%	0.30	NO
PUC Distribution Inc.	8.3%	0.30	4.9%	0.30	NO

Table 4

Summary of Stretch Factor Assignments

	2017-2019		2018-2020		Change in Stretch Factor
	Benchmarking Performance	Stretch Factor	Benchmarking Performance	Stretch Factor	
Renfrew Hydro Inc.	5.3%	0.30	2.0%	0.30	NO
Rideau St. Lawrence Distribution Inc.	**-8.3%**	**0.30**	**-12.0%**	**0.15**	**YES**
Sioux Lookout Hydro Inc.	-14.6%	0.15	-20.6%	0.15	NO
Synergy North Corporation	7.6%	0.30	4.7%	0.30	NO
Tillsonburg Hydro Inc.	1.9%	0.30	0.5%	0.30	NO
Toronto Hydro-Electric System Limited	52.9%	0.60	52.9%	0.60	NO
Wasaga Distribution Inc.	-45.1%	0.00	-45.4%	0.00	NO
Waterloo North Hydro Inc.	9.1%	0.30	7.1%	0.30	NO
Welland Hydro-Electric System Corp.	**-23.0%**	**0.15**	**-26.6%**	**0.00**	**YES**
Wellington North Power Inc.	9.4%	0.30	6.1%	0.30	NO
Westario Power Inc.	-5.9%	0.30	-9.1%	0.30	NO

Table 5

Stretch Factor Assignments by Group

Group I (9 Distributors)	Group II (17 Distributors)		Group III (27 Distributors)		Group IV (4 Distributors)	Group V (2 Distributors)
Stretch Factor = 0%	Stretch Factor = 0.15%		Stretch Factor = 0.30%		Stretch Factor = 0.45%	Stretch Factor = 0.60%
Cooperative Hydro Embrun Inc.	Burlington Hydro Inc.	Lakeland Power Distribution Ltd.	Alectra Utilities Corporation	Niagara Peninsula Energy Inc.	Canadian Niagara Power Inc.	Algoma Power Inc.
E.L.K. Energy Inc.	Energy+ Inc.	Milton Hydro Distribution Inc.	Atikokan Hydro Inc.	Niagara-on-the-Lake Hydro Inc.	Chapleau Public Utilities Corporation	Toronto Hydro-Electric System Limited
Grimsby Power Incorporated	Entegrus Powerlines Inc.	**Newmarket-Tay Power Distribution Ltd.**	Bluewater Power Distribution Corporation	North Bay Hydro Distribution Limited	Hydro One Networks Inc.	
Halton Hills Hydro Inc.	EPCOR Electricity Distribution Ontario Inc.	Orangeville Hydro Limited	Brantford Power Inc.	Oakville Hydro Electricity Distribution Inc.	Hydro Ottawa Limited	
Hearst Power Distribution Company Limited	Espanola Regional Hydro Distribution Corporation	Oshawa PUC Networks Inc.	Centre Wellington Hydro Ltd.	Orillia Power Distribution Corporation		
Hydro Hawkesbury Inc.	Essex Powerlines Corporation	Ottawa River Power Corporation	EnWin Utilities Ltd.	Peterborough Distribution Incorporated		
Northern Ontario Wires Inc.	Hydro 2000 Inc.	**Rideau St. Lawrence Distribution Inc.**	Elexicon Energy Inc.	PUC Distribution Inc.		
Wasaga Distribution Inc.	Kitchener-Wilmot Hydro Inc.	Sioux Lookout Hydro Inc.	ERTH Power Corporation	Renfrew Hydro Inc.		
Welland Hydro-Electric System Corp.	Lakefront Utilities Inc.		Festival Hydro Inc.	Synergy North Corporation		
			Fort Frances Power Corporation	Tillsonburg Hydro Inc.		
			Greater Sudbury Hydro Inc.	Waterloo North Hydro Inc.		
			Innpower Corporation	Wellington North Power Inc.		
			Kingston Hydro Corporation	Westario Power Inc.		
			London Hydro Inc.			