

Empirical Research in Support of Incentive Rate-Setting: 2021 Benchmarking Update

Report to the Ontario Energy Board

July 2022



Pacific Economics Group Research, LLC

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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 2021 Benchmarking Update determines the 2022 stretch factor assignments for distributors in relation to the 2023 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 2014³ 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 incorporate 2021 data to update the stretch factors.

Section 2 of this report discusses the methodology used for the 2021 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 labour 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 results⁴. 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 2013-2021 data - to produce 2021 predicted cost. The rationale for this decision is discussed in the Board Report and in a memorandum by PEG.⁵

To apply the 2021 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 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 data collected related to capital additions. As a result, improved data are available for 2013-2021. 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 Hydro One Networks acquired Orillia Power Distribution and Peterborough Distribution which have now consolidated reporting with HON and are therefore benchmarked as a single entity.

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 revised 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 in order 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 This report also incorporates a correction to two data items related to the HON acquisition of Haldimand and Woodstock in 2016. There was no material change in results.¹⁰

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 2020 and 2019 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 2021 result consistent with the previously published 2019 and 2020 results while still allowing the calculation of revised results for previous years, if applicable, to show the impact of any data revision.

¹⁰ The reported line km for HON did not include the km for acquired distributors and one formula did not account for the capital stock of Woodstock and Haldimand.



the impact of the data changes but were not used as discussed above to calculate the new 2019-2021 average cost performance used to determine the 2022 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 2020 to 2021. Table 3 (A) presents the 2021 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 2020 and 2021. As can be seen, industry total cost decreased by 1.85% on average from 2020-2021. Total OM&A cost grew by 1.97% and capital cost grew on average by 1.95%¹¹.

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

¹¹ Although not common, it is possible for the sample average growth in the sum of two items to not be between the sample average growth of pieces comprising the sum. Each distributor has an equal weight in determining the average but may have an atypical contribution to total cost which can cause this effect.



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 2021 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 2021 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.

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 formula¹². 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 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

¹² The weight given to the non-labour index in the inflation formula includes capital cost.



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 2021 data.

4. Benchmarking Results and Updated Stretch Factors

Table 3 (A) presents a summary of the current benchmarking results for each distributor from 2018-2021. The updated average cost performance is based on a three-year rolling average calculated from the 2019-2021 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 (2018-2020).¹³ The electricity distributor sector has shown consistent year-over-year cost performance improvements. The average level of cost performance in 2021 for the distributors is 13.2% 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 to recent years.

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 2019 and 2020 results were recalculated to demonstrate the impact on the previously published 2018-2020 average cost performance. Table 3 (B) shows the impact of LDC data revisions on 2019 and 2020 cost performance for those companies that had approved changes since the previous update¹⁴. No revisions would have changed previously determined cohort placement.

¹³ Changes in average cost performance are due to not only the addition of 2021 results, but the removal of 2018 results. It is therefore possible to simultaneously have improved 2021 cost performance and deteriorating average performance.

¹⁴ There were no accepted revisions to 2018 data since the previous update.



Updated stretch factors are assigned based on a three-year average of actual less predicted cost over the 2019-2021 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 2021 update. A total of six companies have been assigned different stretch factors and all six 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 2021 calculations.

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 2021 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
2021 Operation	A		RRR
2021 Maintenance	B		RRR
2021 Billing and Collection	C		RRR
2021 Community Relations	D		RRR
2021 Administrative and General Expenses	E		RRR
2021 Insurance Expense	F		RRR
2021 Advertising Expenses	G		RRR
Adjustments to OM&A			
2021 HV Adjustment	I		RRR
2021 LV Adjustment	J		Hydro One Networks
Capital			
2020 Asset Price Index	K		Previous Year Calculations
2020 Capital Quantity	M		Previous Year Calculations
2021 Asset Price Index	O	=K x (GDPPPI-FDD 2021 / GDPPPI-FDD 2020)	Formula, Statistics Canada
2021 Capital Additions	P		RRR
2021 HV Capital Additions	Q		RRR
2021 Quantity of Capital Additions	R	=(P-Q) / O	Formula
Depreciation Rate	S	Fixed at 4.59% for All Years	PEG Report for 4GIR
2021 Capital Quantity	T	= M - S x M + R	Formula
2021 Rate of Return	U		OEB Decision
2021 Capital Price	V	=U x K + S x O	Formula
2021 Capital Cost	W	= V x T	Formula

Table 2

Total Cost by Distributor: 2020 vs. 2021

	OM&A Cost			Capital Cost			Total Cost		
	2020	2021	Percent Change	2020	2021	Percent Change	2020	2021	Percent Change
Alectra Utilities Corporation	246,360,016	250,670,046	1.73%	482,435,863	488,587,309	1.27%	728,795,879	739,257,355	1.43%
Algoma Power Inc.	13,122,891	13,481,111	2.69%	13,699,275	15,108,636	9.79%	26,822,166	28,589,748	6.38%
Atikokan Hydro Inc.	1,110,089	1,104,348	-0.52%	561,793	553,885	-1.42%	1,671,883	1,658,233	-0.82%
Bluewater Power Distribution Corporation	12,871,965	12,851,070	-0.16%	13,356,760	13,576,798	1.63%	26,228,724	26,427,868	0.76%
Brantford Power Inc.	11,056,986	10,965,030	-0.84%	12,368,681	12,784,140	3.30%	23,425,667	23,749,171	1.37%
Burlington Hydro Inc.	19,760,560	20,873,792	5.48%	25,163,397	26,044,424	3.44%	44,923,958	46,918,216	4.34%
Canadian Niagara Power Inc.	9,416,459	9,849,848	4.50%	16,367,735	17,328,066	5.70%	25,784,193	27,177,914	5.26%
Centre Wellington Hydro Ltd.	2,465,654	2,469,580	0.16%	2,452,597	2,403,595	-2.02%	4,918,251	4,873,175	-0.92%
Chapleau Public Utilities Corporation	824,639	727,953	-12.47%	224,680	227,695	1.33%	1,049,319	955,648	-9.35%
Cooperative Hydro Embrun Inc.	730,185	708,060	-3.08%	501,878	498,034	-0.77%	1,232,062	1,206,094	-2.13%
E.L.K. Energy Inc.	na	na		na	na		na	na	
Energy+ Inc.	18,601,179	20,470,293	9.57%	25,608,031	25,713,598	0.41%	44,209,209	46,183,891	4.37%
Entegrus Powerlines Inc.	13,263,123	13,465,296	1.51%	20,234,041	20,838,264	2.94%	33,497,164	34,303,560	2.38%
EnWin Utilities Ltd.	25,310,135	24,563,149	-3.00%	37,056,688	36,535,382	-1.42%	62,366,823	61,098,531	-2.05%
Ellexicon Energy Inc.	40,002,781	42,460,839	5.96%	66,700,666	69,350,786	3.90%	106,703,447	111,811,625	4.68%
EPCOR Electricity Distribution Ontario Inc.	6,144,806	5,811,191	-5.58%	4,915,178	4,985,458	1.42%	11,059,984	10,796,649	-2.41%
ERTH Power Corporation	7,273,017	7,347,656	1.02%	8,737,695	8,868,332	1.48%	16,010,712	16,215,988	1.27%
Espanola Regional Hydro Distribution Corporation	1,605,579	1,599,587	-0.37%	777,752	787,891	1.30%	2,383,331	2,387,478	0.17%
Essex Powerlines Corporation	7,805,877	7,422,000	-5.04%	9,903,134	10,001,626	0.99%	17,709,011	17,423,626	-1.62%
Festival Hydro Inc.	6,002,784	5,861,377	-2.38%	7,611,894	7,585,321	-0.35%	13,614,678	13,446,698	-1.24%
Fort Frances Power Corporation	1,565,266	1,607,047	2.63%	899,994	895,093	-0.55%	2,465,260	2,502,140	1.48%
Greater Sudbury Hydro Inc.	14,709,333	14,858,594	1.01%	17,354,767	17,624,536	1.54%	32,064,100	32,483,130	1.30%
Grimsby Power Incorporated	3,388,617	3,463,611	2.19%	3,604,656	3,684,545	2.19%	6,993,273	7,148,156	2.19%
Halton Hills Hydro Inc.	6,452,824	6,794,948	5.17%	11,687,867	11,684,584	-0.03%	18,140,691	18,479,532	1.85%
Hearst Power Distribution Company Limited	1,089,704	1,171,996	7.28%	353,090	374,730	5.95%	1,442,794	1,546,725	6.96%
Hydro 2000 Inc.	584,260	608,701	4.10%	148,207	154,376	4.08%	732,466	763,077	4.09%
Hydro Hawkesbury Inc.	1,090,445	1,201,692	9.71%	579,723	576,622	-0.54%	1,670,167	1,778,314	6.27%
Hydro One Networks Inc.	541,112,566	558,146,885	3.10%	897,288,023	929,006,489	3.47%	1,438,400,589	1,487,153,374	3.33%
Hydro Ottawa Limited	80,181,186	81,235,640	1.31%	167,096,745	172,956,816	3.45%	247,277,931	254,192,456	2.76%
Innpower Corporation	6,121,413	6,512,895	6.20%	10,303,063	11,161,232	8.00%	16,424,476	17,674,127	7.33%
Kingston Hydro Corporation	7,017,165	6,636,393	-5.58%	8,555,764	8,578,075	0.26%	15,572,929	15,214,468	-2.33%
Kitchener-Wilmot Hydro Inc.	18,911,859	21,120,815	11.05%	32,485,556	34,114,204	4.89%	51,397,415	55,235,020	7.20%
Lakefront Utilities Inc.	2,668,436	2,645,596	-0.86%	2,649,011	2,921,483	9.79%	5,317,447	5,567,079	4.59%
Lakeland Power Distribution Ltd.	5,188,177	5,114,415	-1.43%	4,823,179	5,025,312	4.11%	10,011,356	10,139,728	1.27%
London Hydro Inc.	38,287,946	41,026,725	6.91%	52,935,175	53,734,634	1.50%	91,223,121	94,761,359	3.81%
Milton Hydro Distribution Inc.	10,485,033	11,186,491	6.48%	17,619,204	17,574,100	-0.26%	28,104,237	28,760,591	2.31%
Newmarket-Tay Power Distribution Ltd.	11,873,565	11,558,179	-2.69%	16,569,447	17,334,745	4.52%	28,443,012	28,892,924	1.57%
Niagara Peninsula Energy Inc.	18,278,751	17,912,140	-2.03%	24,908,996	25,411,982	2.00%	43,187,747	43,324,122	0.32%
Niagara-on-the-Lake Hydro Inc.	2,911,179	3,146,520	7.77%	4,308,622	4,328,356	0.46%	7,219,801	7,474,877	3.47%
North Bay Hydro Distribution Limited	6,656,816	6,876,795	3.25%	10,718,413	10,835,020	1.08%	17,375,228	17,711,815	1.92%
Northern Ontario Wires Inc.	2,775,792	2,787,306	0.41%	1,409,058	1,388,911	-1.44%	4,184,850	4,176,217	-0.21%
Oakville Hydro Electricity Distribution Inc.	18,103,232	18,391,124	1.58%	34,580,796	34,912,249	0.95%	52,684,028	53,303,374	1.17%
Orangeville Hydro Limited	3,189,463	3,381,843	5.86%	3,606,292	3,640,843	0.95%	6,795,755	7,022,686	3.28%
Oshawa PUC Networks Inc.	12,083,296	12,893,929	6.49%	22,293,683	22,563,393	1.20%	34,376,979	35,457,322	3.09%

Table 2

Total Cost by Distributor: 2020 vs. 2021

	OM&A Cost			Capital Cost			Total Cost		
	2020	2021	Percent Change	2020	2021	Percent Change	2020	2021	Percent Change
Ottawa River Power Corporation	3,468,416	3,518,816	1.44%	2,484,957	2,501,631	0.67%	5,953,373	6,020,446	1.12%
PUC Distribution Inc.	10,623,175	11,544,844	8.32%	12,100,328	12,040,385	-0.50%	22,723,503	23,585,229	3.72%
Renfrew Hydro Inc.	1,411,561	1,500,880	6.14%	1,207,746	1,208,940	0.10%	2,619,307	2,709,821	3.40%
Rideau St. Lawrence Distribution Inc.	2,215,871	2,318,119	4.51%	1,169,180	1,216,012	3.93%	3,385,051	3,534,131	4.31%
Sioux Lookout Hydro Inc.	1,495,093	1,465,654	-1.99%	919,915	908,898	-1.20%	2,415,008	2,374,552	-1.69%
Synergy North Corporation	15,980,377	16,069,352	0.56%	20,471,244	20,983,457	2.47%	36,451,621	37,052,809	1.64%
Tillsonburg Hydro Inc.	2,794,063	2,826,250	1.15%	2,571,495	2,613,739	1.63%	5,365,559	5,439,989	1.38%
Toronto Hydro-Electric System Limited	254,882,858	260,775,921	2.29%	647,906,436	673,197,983	3.83%	902,789,294	933,973,904	3.40%
Wasaga Distribution Inc.	3,505,519	3,001,623	-15.52%	3,031,566	3,185,495	4.95%	6,537,086	6,187,118	-5.50%
Waterloo North Hydro Inc.	13,591,305	15,128,077	10.71%	32,994,597	33,381,508	1.17%	46,585,903	48,509,585	4.05%
Welland Hydro-Electric System Corp.	6,580,466	6,748,528	2.52%	5,294,378	5,405,473	2.08%	11,874,844	12,154,000	2.32%
Wellington North Power Inc.	1,856,980	1,849,244	-0.42%	1,420,412	1,427,673	0.51%	3,277,392	3,276,916	-0.01%
Westario Power Inc.	5,997,247	6,737,082	11.63%	8,097,246	8,036,376	-0.75%	14,094,493	14,773,458	4.70%
Average	28,265,321	29,044,052	1.97%	50,627,260	52,113,735	1.95%	78,892,581	81,157,786	1.85%
Median		2.72%	1.66%		2.89%	1.38%		2.83%	1.88%

na = Distributor did not provide all the required information in time for this report

Table 3 (A)

Summary of Cost Performance Results

	Cost Efficiency Assessment						Difference from 2018- 2020
	2018	2019	2020	2021	2018-2020	2019-2021	
Alectra Utilities Corporation	-0.8%	0.1%	-4.4%	-6.9%	-1.7%	-3.7%	-2.0%
Algoma Power Inc.	66.1%	64.3%	61.9%	63.7%	64.1%	63.3%	-0.8%
Atikokan Hydro Inc.	9.6%	6.6%	2.8%	-0.9%	6.3%	2.8%	-3.5%
Bluewater Power Distribution Corporation	3.7%	0.3%	-4.5%	-7.6%	-0.2%	-3.9%	-3.8%
Brantford Power Inc.	-9.4%	-10.2%	-4.8%	-7.4%	-8.1%	-7.5%	0.7%
Burlington Hydro Inc.	-13.9%	-11.7%	-13.0%	-11.7%	-12.9%	-12.1%	0.7%
Canadian Niagara Power Inc.	17.1%	15.6%	11.0%	11.8%	14.6%	12.8%	-1.7%
Centre Wellington Hydro Ltd.	-0.3%	-1.1%	-11.2%	-16.7%	-4.2%	-9.7%	-5.5%
Chapleau Public Utilities Corporation	24.2%	25.4%	18.9%	4.0%	22.8%	16.1%	-6.7%
Cooperative Hydro Embrun Inc.	-44.8%	-51.3%	-54.7%	-62.4%	-50.3%	-56.1%	-5.9%
E.L.K. Energy Inc.	na	na	na	na	na	na	na
Elexicon Energy Inc.	-5.5%	-1.0%	-4.3%	-2.9%	-3.6%	-2.7%	0.8%
Energy+ Inc.	-13.1%	-14.1%	-14.4%	-13.6%	-13.9%	-14.1%	-0.2%
Entegrus Powerlines Inc.	-16.0%	-21.0%	-25.4%	-28.7%	-20.8%	-25.0%	-4.2%
ENWIN Utilities Ltd.	-2.7%	-10.1%	-15.3%	-22.4%	-9.4%	-15.9%	-6.6%
EPCOR Electricity Distribution Ontario Inc.	-19.3%	-3.9%	-9.8%	-16.5%	-11.0%	-10.1%	0.9%
ERTH Power Corporation	6.6%	1.3%	-1.5%	-4.8%	2.1%	-1.7%	-3.8%
Espanola Regional Hydro Distribution Corporation	-24.8%	-17.2%	-25.5%	-29.2%	-22.5%	-24.0%	-1.5%
Essex Powerlines Corporation	-12.3%	-19.2%	-23.8%	-31.6%	-18.4%	-24.8%	-6.4%
Festival Hydro Inc.	10.8%	5.9%	1.6%	-3.4%	6.1%	1.4%	-4.8%
Fort Frances Power Corporation	-0.8%	-5.1%	-11.4%	-12.8%	-5.7%	-9.8%	-4.0%
Greater Sudbury Hydro Inc.	7.6%	5.1%	3.0%	1.4%	5.3%	3.2%	-2.1%
Grimsby Power Incorporated	-27.6%	-31.8%	-34.5%	-38.5%	-31.3%	-34.9%	-3.6%

Table 3 (A)

Summary of Cost Performance Results

	Cost Efficiency Assessment						Difference from 2018- 2020
	2018	2019	2020	2021	2018-2020	2019-2021	
Halton Hills Hydro Inc.	-29.2%	-30.3%	-33.8%	-35.7%	-31.1%	-33.3%	-2.2%
Hearst Power Distribution Company Limited	-21.3%	-28.7%	-31.6%	-30.5%	-27.2%	-30.3%	-3.1%
Hydro 2000 Inc.	-15.4%	-22.4%	-18.0%	-16.8%	-18.6%	-19.0%	-0.5%
Hydro Hawkesbury Inc.	-57.7%	-69.3%	-66.4%	-65.3%	-64.4%	-67.0%	-2.5%
Hydro One Networks Inc.	15.7%	15.9%	15.7%	18.1%	15.8%	16.6%	0.8%
Hydro Ottawa Limited	18.2%	20.4%	19.8%	19.5%	19.5%	19.9%	0.4%
Innpower Corporation	-2.2%	-5.3%	-6.8%	-5.2%	-4.8%	-5.8%	-1.0%
Kingston Hydro Corporation	1.3%	-3.8%	-6.8%	-12.8%	-3.1%	-7.8%	-4.7%
Kitchener-Wilmot Hydro Inc.	-19.2%	-21.1%	-22.1%	-18.2%	-20.8%	-20.5%	0.3%
Lakefront Utilities Inc.	-21.0%	-24.4%	-27.2%	-27.0%	-24.2%	-26.2%	-2.0%
Lakeland Power Distribution Ltd.	-9.2%	-14.2%	-16.9%	-19.6%	-13.4%	-16.9%	-3.4%
London Hydro Inc.	-5.9%	-5.8%	-6.3%	-5.7%	-6.0%	-5.9%	0.1%
Milton Hydro Distribution Inc.	-17.4%	-18.7%	-23.7%	-26.8%	-19.9%	-23.1%	-3.1%
Newmarket-Tay Power Distribution Ltd.	-10.0%	-9.8%	-15.9%	-17.6%	-11.9%	-14.4%	-2.5%
Niagara Peninsula Energy Inc.	1.3%	1.1%	-2.8%	-7.8%	-0.1%	-3.2%	-3.0%
Niagara-on-the-Lake Hydro Inc.	-5.2%	-9.5%	-12.7%	-13.1%	-9.1%	-11.8%	-2.6%
North Bay Hydro Distribution Limited	3.3%	4.9%	1.4%	0.4%	3.2%	2.2%	-1.0%
Northern Ontario Wires Inc.	-37.3%	-38.2%	-42.1%	-45.7%	-39.2%	-42.0%	-2.8%
Oakville Hydro Electricity Distribution Inc.	1.0%	0.3%	-3.8%	-6.4%	-0.8%	-3.3%	-2.5%
Orangeville Hydro Limited	-20.0%	-20.7%	-28.8%	-29.6%	-23.1%	-26.3%	-3.2%
Oshawa PUC Networks Inc.	-14.4%	-12.0%	-16.6%	-16.8%	-14.4%	-15.1%	-0.8%
Ottawa River Power Corporation	-21.9%	-18.9%	-24.3%	-28.8%	-21.7%	-24.0%	-2.3%
PUC Distribution Inc.	8.2%	5.5%	1.1%	1.8%	4.9%	2.8%	-2.1%

Table 3 (A)

Summary of Cost Performance Results

	Cost Efficiency Assessment						Difference from 2018- 2020
	2018	2019	2020	2021	2018-2020	2019-2021	
Renfrew Hydro Inc.	7.2%	1.1%	-2.5%	-3.1%	2.0%	-1.5%	-3.5%
Rideau St. Lawrence Distribution Inc.	-9.4%	-11.2%	-15.4%	-15.4%	-12.0%	-14.0%	-2.0%
Sioux Lookout Hydro Inc.	-16.9%	-19.0%	-25.8%	-35.1%	-20.6%	-26.6%	-6.1%
Synergy North Corporation	7.4%	6.2%	0.5%	-0.8%	4.7%	2.0%	-2.7%
Tillsonburg Hydro Inc.	3.2%	3.7%	-5.5%	-9.8%	0.5%	-3.9%	-4.4%
Toronto Hydro-Electric System Limited	53.0%	52.8%	52.9%	53.2%	52.9%	53.0%	0.1%
Wasaga Distribution Inc.	-46.7%	-42.9%	-46.6%	-56.7%	-45.4%	-48.7%	-3.3%
Waterloo North Hydro Inc.	9.7%	8.1%	3.5%	4.2%	7.1%	5.2%	-1.8%
Welland Hydro-Electric System Corp.	-24.0%	-25.4%	-30.3%	-32.6%	-26.6%	-29.5%	-2.9%
Wellington North Power Inc.	8.7%	6.7%	2.9%	-4.0%	6.1%	1.9%	-4.3%
Westario Power Inc.	-8.5%	-7.7%	-11.1%	-10.3%	-9.1%	-9.7%	-0.6%
Average	-5.7%	-7.2%	-10.8%	-13.2%	-7.9%	-10.4%	-2.5%
Median	-5.7%	-6.8%	-11.1%	-12.8%	-8.6%	-9.7%	-2.5%
Max	66.1%	64.3%	61.9%	63.7%	64.1%	63.3%	0.9%
Min	-57.7%	-69.3%	-66.4%	-65.3%	-64.4%	-67.0%	-6.7%

na = Distributor did not provide all the required information in time for this report

Table 3 (B)

Summary of the Impact of Revised Data on Cost Performance Results

Distributors with approved 2019 and/or 2020 data revisions for the 2021 data update	2018 Cost Performance			2019 Cost Performance			2020 Cost Performance			2017-2020 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
North Bay Hydro Distribution Limited	3.3%	na	na	4.9%	5.0%	-0.13%	1.4%	1.7%	-0.23%	3.2%	3.3%	0.12%
Festival Hydro Inc.	10.8%	na	na	5.9%	5.9%	0.03%	1.6%	1.6%	0.03%	6.1%	6.1%	-0.02%
Wellington North Power Inc.	8.7%	na	na	6.7%	6.7%	0.02%	2.9%	2.9%	0.01%	6.1%	6.1%	-0.01%
Milton Hydro Distribution Inc.	-17.4%	na	na	-18.7%	-21.3%	2.57%	-23.7%	-26.4%	2.71%	-19.9%	-21.7%	-1.76%
Niagara Peninsula Energy Inc.	1.3%	na	na	1.1%	1.1%	0.00%	-2.8%	-2.8%	0.00%	-0.1%	-0.1%	0.00%
Tillsonburg Hydro Inc.	3.2%	na	na	3.7%	3.7%	0.00%	-5.5%	-5.6%	0.12%	0.5%	0.4%	-0.04%

* There were no new revisions to 2017 data. The impact of revisions are not cumulative with revisions from previous updates. 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

	2018-2020		2019-2021		Change in Stretch Factor
	Benchmarking Performance	Stretch Factor	Benchmarking Performance	Stretch Factor	
Alectra Utilities Corporation	-1.7%	0.30	-3.7%	0.30	NO
Algoma Power Inc.	64.1%	0.60	63.3%	0.60	NO
Atikokan Hydro Inc.	6.3%	0.30	2.8%	0.30	NO
Bluewater Power Distribution Corporation	-0.2%	0.30	-3.9%	0.30	NO
Brantford Power Inc.	-8.1%	0.30	-7.5%	0.30	NO
Burlington Hydro Inc.	-12.9%	0.15	-12.1%	0.15	NO
Canadian Niagara Power Inc.	14.6%	0.45	12.8%	0.45	NO
Centre Wellington Hydro Ltd.	-4.2%	0.30	-9.7%	0.30	NO
Chapleau Public Utilities Corporation	22.8%	0.45	16.1%	0.45	NO
Cooperative Hydro Embrun Inc.	-50.3%	0.00	-56.1%	0.00	NO
E.L.K. Energy Inc.	na	na	na	na	na
Ellexicon Energy Inc.	-3.6%	0.30	-2.7%	0.30	NO
Energy+ Inc.	-13.9%	0.15	-14.1%	0.15	NO
Entegrus Powerlines Inc.	-20.8%	0.15	-25.0%	0.00	YES
ENWIN Utilities Ltd.	-9.4%	0.30	-15.9%	0.15	YES
EPCOR Electricity Distribution Ontario Inc.	-11.0%	0.15	-10.1%	0.15	NO
ERTH Power Corporation	2.1%	0.30	-1.7%	0.30	NO
Espanola Regional Hydro Distribution Corporation	-22.5%	0.15	-24.0%	0.15	NO
Essex Powerlines Corporation	-18.4%	0.15	-24.8%	0.15	NO
Festival Hydro Inc.	6.1%	0.30	1.4%	0.30	NO
Fort Frances Power Corporation	-5.7%	0.30	-9.8%	0.30	NO
Greater Sudbury Hydro Inc.	5.3%	0.30	3.2%	0.30	NO
Grimsby Power Incorporated	-31.3%	0.00	-34.9%	0.00	NO
Halton Hills Hydro Inc.	-31.1%	0.00	-33.3%	0.00	NO
Hearst Power Distribution Company Limited	-27.2%	0.00	-30.3%	0.00	NO

Table 4

Summary of Stretch Factor Assignments

	2018-2020		2019-2021		Change in Stretch Factor
	Benchmarking Performance	Stretch Factor	Benchmarking Performance	Stretch Factor	
Hydro 2000 Inc.	-18.6%	0.15	-19.0%	0.15	NO
Hydro Hawkesbury Inc.	-64.4%	0.00	-67.0%	0.00	NO
Hydro One Networks Inc.	15.8%	0.45	16.6%	0.45	NO
Hydro Ottawa Limited	19.5%	0.45	19.9%	0.45	NO
Innpower Corporation	-4.8%	0.30	-5.8%	0.30	NO
Kingston Hydro Corporation	-3.1%	0.30	-7.8%	0.30	NO
Kitchener-Wilmot Hydro Inc.	-20.8%	0.15	-20.5%	0.15	NO
Lakefront Utilities Inc.	-24.2%	0.15	-26.2%	0.00	YES
Lakeland Power Distribution Ltd.	-13.4%	0.15	-16.9%	0.15	NO
London Hydro Inc.	-6.0%	0.30	-5.9%	0.30	NO
Milton Hydro Distribution Inc.	-19.9%	0.15	-23.1%	0.15	NO
Newmarket-Tay Power Distribution Ltd.	-11.9%	0.15	-14.4%	0.15	NO
Niagara Peninsula Energy Inc.	-0.1%	0.30	-3.2%	0.30	NO
Niagara-on-the-Lake Hydro Inc.	-9.1%	0.30	-11.8%	0.15	YES
North Bay Hydro Distribution Limited	3.2%	0.30	2.2%	0.30	NO
Northern Ontario Wires Inc.	-39.2%	0.00	-42.0%	0.00	NO
Oakville Hydro Electricity Distribution Inc.	-0.8%	0.30	-3.3%	0.30	NO
Orangeville Hydro Limited	-23.1%	0.15	-26.3%	0.00	YES
Oshawa PUC Networks Inc.	-14.4%	0.15	-15.1%	0.15	NO
Ottawa River Power Corporation	-21.7%	0.15	-24.0%	0.15	NO
PUC Distribution Inc.	4.9%	0.30	2.8%	0.30	NO
Renfrew Hydro Inc.	2.0%	0.30	-1.5%	0.30	NO
Rideau St. Lawrence Distribution Inc.	-12.0%	0.15	-14.0%	0.15	NO
Sioux Lookout Hydro Inc.	-20.6%	0.15	-26.6%	0.00	YES
Synergy North Corporation	4.7%	0.30	2.0%	0.30	NO
Tillsonburg Hydro Inc.	0.5%	0.30	-3.9%	0.30	NO

Table 4

Summary of Stretch Factor Assignments

	<u>2018-2020</u>		<u>2019-2021</u>		Change in Stretch Factor
	Benchmarking Performance	Stretch Factor	Benchmarking Performance	Stretch Factor	
Toronto Hydro-Electric System Limited	52.9%	0.60	53.0%	0.60	NO
Wasaga Distribution Inc.	-45.4%	0.00	-48.7%	0.00	NO
Waterloo North Hydro Inc.	7.1%	0.30	5.2%	0.30	NO
Welland Hydro-Electric System Corp.	-26.6%	0.00	-29.5%	0.00	NO
Wellington North Power Inc.	6.1%	0.30	1.9%	0.30	NO
Westario Power Inc.	-9.1%	0.30	-9.7%	0.30	NO

na = Distributor did not provide all the required information in time for this report

Table 5

Stretch Factor Assignments by Group

Group I (16 Distributors)	Group II (15 Distributors)		Group III (23 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	Burlington Hydro	Lakeland Power Distribution	Alectra Utilities Corporation	London Hydro	Canadian Niagara Power	Algoma Power
E.L.K. Energy *	Energy+	Milton Hydro Distribution	Atikokan Hydro	Niagara Peninsula Energy	Chapleau Public Utilities Corporation	Toronto Hydro- Electric System Limited
Entegrus Powerlines	EnWin Utilities Ltd.	Newmarket-Tay Power Distribution Ltd.	Bluewater Power Distribution	North Bay Hydro Distribution	Hydro One Networks	
Grimsby Power Incorporated	EPCOR Electricity Distribution Ontario	Niagara-on-the-Lake Hydro	Brantford Power	Oakville Hydro Electricity Distribution	Hydro Ottawa Limited	
Halton Hills Hydro	Espanola Regional Hydro Distribution	Oshawa PUC Networks	Centre Wellington Hydro	PUC Distribution		
Hearst Power Distribution Company Limited	Essex Powerlines Corporation	Ottawa River Power Corporation	Elexicon Energy	Renfrew Hydro		
Hydro Hawkesbury	Hydro 2000	Rideau St. Lawrence Distribution	ERTH Power Corporation	Synergy North		
Lakefront Utilities	Kitchener-Wilmot Hydro		Festival Hydro	Tillsonburg Hydro		
Northern Ontario Wires			Fort Frances Power Corporation	Waterloo North Hydro		
Orangeville Hydro Limited			Greater Sudbury Hydro	Wellington North Power		
Sioux Lookout Hydro			Innpower Corporation	Westario Power		
Wasaga Distribution			Kingston Hydro Corporation			
Welland Hydro-Electric System Corp.						

* E.L.K. Energy did not provide all the required information in time for this report. Based on previous cost performance, PEG believes that it is very likely that E.L.K. Energy will retain the previously assigned 0% stretch factor once the required information is available.