Empirical Research in Support of Incentive Rate-Setting: 2023 Benchmarking Update

Report to the Ontario Energy Board

July 2024

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 2023 Benchmarking Update determines the 2024 stretch factor assignments for distributors in relation to the 2025 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 own operating conditions. Distributors that achieved an actual cost lower than the cost 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 each year since. This report presents updated benchmarking results that incorporate 2023 data to update the stretch factors.

[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".

Section 2 of this report discusses the methodology used for the 2023 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 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 better cost performers and therefore eligible for lower stretch factors. A 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 2013 PEG report. The OEB intentionally decided not to update the parameters of

[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.

the econometric model to include future years' data. The goal was to establish a fixed benchmark via the unchanged model parameters which would allow distributors a fair opportunity to demonstrate continuous improvement of cost performance and earn a lower stretch factor. The parameters from the model were combined with each company's data – including 2013-2023 data - to produce 2023 predicted cost. The rationale for this decision is discussed in the Board Report and in a memorandum by PEG.[5]

To apply the 2023 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 such transformation is to express many of the explanatory variables 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 accounted for by the variables is deemed to be an estimate of 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 the published OEB Cost of Capital Parameter Updates[7]. Statistics Canada is the source for other input price data. 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.[8]

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 2013-2023. 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 calculated from the historical results of the predecessor distributors that were amalgamated or

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[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] https://www.oeb.ca/regulatory-rules-and-documents/rules-codes-and-requirements/cost-capital-parameter-updates

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

acquired.[9] In each of these cases the companies have consolidated reporting and are benchmarked as single entities under the new company names. There were no amalgamations in 2023.

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. [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 2022, 2021, and 2020 results are presented only for the purposes of showing the impact of the data changes. As discussed above, they were not used to calculate the new 2020-2022 average cost performance used to determine the 2023 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 2022 to 2023. Table 3 (A) presents the 2023 benchmarking results and a comparison to prior years' results. Table 3 (B)

[9] 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.

[10] 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 2023 result consistent with the previously published 2020, 2021 and 2022 results while still allowing the calculation of revised results for previous years, if applicable, to show the impact of any data revision.

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 years' 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 2022 and 2023. As can be seen, industry total cost increased by 13.05% on average from 2022-2023. Total OM&A cost grew by 5.31% and capital cost grew on average by 19.07%. While the percentage change in capital and total costs may seem high, the OEB's approved rate of return increased by a roughly commensurate amount.

The econometric model estimates LDCs' costs as a function of distributor output, input price growth, and other business condition variables which are considered as beyond management control. The model 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 in distributor cost not accounted for by these factors are deemed to be due to management performance. The parameter estimates measure the average 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 of the quantity of distributor output. The first is the number of customers served, the second is kWh delivered, and 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 system capacity. The kWh delivered was the least important of the output variables. For the average company, the number of customers was observed 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 2023 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 2022 growth in the OM&A price index is calculated as 70% times average weekly earnings growth plus 30% times GDPIPI (FDD) growth. The 2022 values for the OM&A price index from the previous report were escalated by the growth that occurred in 2023.

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[11]. 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 of distribution line. For each 1% change in average 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

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

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 2023 data.

4. Benchmarking Results and Updated Stretch Factors

Table 3 (A) presents a summary of the current benchmarking results for each distributor from 2020-2023. The updated average cost performance is based on a three-year rolling average calculated from the 2021-2023 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 (2020-2022).[12] The electricity distributor sector has shown consistent year-over-year cost performance improvements. The average level of cost performance in 2023 for the distributors is 14.1% 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 2020, 2021, and 2022 results were recalculated to demonstrate the impact on the previously published 2020-2022 average cost performance. Table 3 (B) shows the impact of LDC data revisions on 2020, 2021, and 2022 cost performance for those companies that had approved changes since the previous update. 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 2021-2023 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

[12] Changes in average cost performance are due to not only the addition of 2023 results, but the removal of 2020 results. It is therefore possible to simultaneously have improved 2023 cost performance and deteriorating average performance.

predicted cost received a stretch factor of 0.30%. Those distributors that had cost in excess of 10% and up to 25% above predicted cost received a stretch factor of 0.45%. Any distributors that had actual costs 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 2023 update. A total of three companies have been assigned different stretch factors and all three 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 2023 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 2023 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
2023	Operation	A		RRR
2023	Maintenance	B		RRR
2023	Billing and Collection	C		RRR
2023	Community Relations	D		RRR
2023	Administrative and General Expenses	E		RRR
2023	Insurance Expense	F		RRR
2023	Advertising Expenses	G		RRR
Adjustments to OM&A				
2023	HV Adjustment	I		RRR
2023	LV Adjustment	J		Hydro One Networks
Capital				
2022	Asset Price Index	K		Previous Year Calculations
2022	Capital Quantity	M		Previous Year Calculations
2023	Asset Price Index	O	=K x (GDPPI-FDD 2021 / GDPPI-FDD 2020)	Formula, Statistics Canada
2023	Capital Additions	P		RRR
2023	HV Capital Additions	Q		RRR
2023	Quantity of Capital Additions	R	=(P-Q) / O	Formula
	Depreciation Rate	S	Fixed at 4.59% for All Years	PEG Report for 4GIR
2023	Capital Quantity	T	= M - S x M + R	Formula
2023	Rate of Return	U		OEB Decision
2023	Capital Price	V	=U x K + S x O	Formula
2023	Capital Cost	W	= V x T	Formula

Table 2

Total Cost by Distributor: 2022 vs. 2023

	OM&A Cost			Capital Cost			Total Cost		
	2022	2023	Percent Change	2022	2023	Percent Change	2022	2023	Percent Change
Alectra Utilities Corporation	268,392,856	275,740,715	2.70%	541,882,560	667,033,540	20.78%	810,275,416	942,774,255	15.15%
Algoma Power Inc.	13,718,921	13,796,191	0.56%	16,849,512	21,053,071	22.27%	30,568,434	34,849,263	13.11%
Atikokan Hydro Inc.	1,174,670	1,188,653	1.18%	603,265	697,539	14.52%	1,777,935	1,886,192	5.91%
Bluewater Power Distribution Corp	13,591,717	13,684,765	0.68%	15,471,223	18,631,928	18.59%	29,062,939	32,316,693	10.61%
Burlington Hydro Inc.	21,411,269	23,087,139	7.54%	28,937,773	35,988,491	21.81%	50,349,042	59,075,631	15.98%
Canadian Niagara Power Inc.	9,680,637	10,655,338	9.59%	19,773,858	24,171,235	20.08%	29,454,496	34,826,573	16.75%
Centre Wellington Hydro Ltd.	2,737,920	2,804,726	2.41%	2,591,655	3,037,050	15.86%	5,329,576	5,841,776	9.18%
Chapleau Public Utilities Corporatio	806,989	936,004	14.83%	247,899	292,065	16.40%	1,054,888	1,228,069	15.20%
Cooperative Hydro Embrun Inc.	692,601	794,475	13.72%	549,556	655,016	17.55%	1,242,157	1,449,491	15.44%
Elexicon Energy Inc.	44,882,223	46,787,704	4.16%	77,772,518	93,608,204	18.53%	122,654,742	140,395,908	13.51%
E.L.K. Energy Inc.	4,208,740	4,152,335	-1.35%	2,741,465	3,360,301	20.35%	6,950,205	7,512,635	7.78%
Enova Power Corp.	38,968,842	39,292,264	0.83%	75,217,696	89,392,498	17.27%	114,186,538	128,684,762	11.95%
Entegrus Powerlines Inc.	15,360,450	16,182,654	5.21%	23,816,601	28,662,967	18.52%	39,177,051	44,845,621	13.51%
ENWIN Utilities Ltd.	25,234,156	27,447,841	8.41%	40,071,263	47,269,397	16.52%	65,305,420	74,717,237	13.46%
EPCOR Electricity Distribution Onta	6,164,718	6,068,316	-1.58%	5,799,345	6,982,251	18.56%	11,964,063	13,050,567	8.69%
ERTH Power Corporation	7,750,360	8,178,713	5.38%	9,821,263	11,806,645	18.41%	17,571,624	19,985,358	12.87%
Essex Powerlines Corporation	8,288,825	8,624,718	3.97%	11,184,053	13,749,241	20.65%	19,472,878	22,373,959	13.89%
Festival Hydro Inc.	6,618,860	7,046,504	6.26%	8,356,830	9,934,514	17.29%	14,975,690	16,981,018	12.57%
Fort Frances Power Corporation	1,761,801	1,899,201	7.51%	996,971	1,185,896	17.35%	2,758,772	3,085,096	11.18%
GrandBridge Energy Inc.	31,809,380	32,538,677	2.27%	43,314,188	52,734,670	19.68%	75,123,569	85,273,346	12.67%
Greater Sudbury Hydro Inc.	15,279,442	16,102,895	5.25%	19,287,608	22,642,502	16.04%	34,567,050	38,745,397	11.41%
Grimsby Power Incorporated	3,773,954	3,889,144	3.01%	4,059,140	4,881,498	18.45%	7,833,094	8,770,642	11.31%
Halton Hills Hydro Inc.	7,237,095	7,576,862	4.59%	12,783,228	15,347,476	18.28%	20,020,323	22,924,338	13.55%
Hearst Power Distribution Compan	1,202,294	1,286,493	6.77%	426,586	505,938	17.06%	1,628,879	1,792,430	9.57%
Hydro 2000 Inc.	661,275	679,372	2.70%	180,250	212,074	16.26%	841,525	891,446	5.76%
Hydro Hawkesbury Inc.	1,200,939	1,453,948	19.12%	636,901	772,099	19.25%	1,837,840	2,226,047	19.16%
Hydro One Networks Inc.	625,202,892	684,623,857	9.08%	1,063,475,844	1,310,817,211	20.91%	1,688,678,736	1,995,441,068	16.69%
Hydro Ottawa Limited	94,710,464	106,888,209	12.10%	196,336,233	233,661,781	17.40%	291,046,698	340,549,990	15.71%
Innpower Corporation	6,701,222	8,088,934	18.82%	13,020,537	16,974,531	26.52%	19,721,759	25,063,464	23.97%

Table 2 (cont'd)

Total Cost by Distributor: 2022 vs. 2023

	OM&A Cost			Capital Cost			Total Cost		
	2022	2023	Percent Change	2022	2023	Percent Change	2022	2023	Percent Change
Kingston Hydro Corporation	7,822,958	8,001,856	2.26%	9,364,188	10,898,408	15.17%	17,187,145	18,900,264	9.50%
Lakefront Utilities Inc.	2,557,283	3,107,067	19.47%	3,345,420	4,094,258	20.20%	5,902,703	7,201,325	19.89%
Lakeland Power Distribution Ltd.	5,713,682	6,085,963	6.31%	5,698,605	6,939,695	19.70%	11,412,287	13,025,657	13.22%
London Hydro Inc.	42,687,578	44,158,081	3.39%	61,266,225	73,140,920	17.72%	103,953,803	117,299,001	12.08%
Milton Hydro Distribution Inc.	11,803,020	11,721,468	-0.69%	19,643,794	23,607,598	18.38%	31,446,814	35,329,066	11.64%
Newmarket-Tay Power Distributio	12,940,656	14,099,664	8.58%	18,659,990	21,773,796	15.43%	31,600,646	35,873,459	12.68%
Niagara Peninsula Energy Inc.	19,048,312	19,942,692	4.59%	28,229,669	33,710,993	17.75%	47,277,981	53,653,685	12.65%
Niagara-on-the-Lake Hydro Inc.	3,219,310	3,367,064	4.49%	4,674,391	5,720,060	20.19%	7,893,702	9,087,124	14.08%
North Bay Hydro Distribution Limit	8,721,483	8,572,962	-1.72%	12,798,000	15,406,223	18.55%	21,519,483	23,979,185	10.82%
Northern Ontario Wires Inc.	3,045,413	3,304,043	8.15%	1,521,717	1,744,750	13.68%	4,567,130	5,048,793	10.03%
Oakville Hydro Electricity Distribut	20,114,506	19,609,317	-2.54%	38,703,763	47,200,783	19.85%	58,818,269	66,810,100	12.74%
Orangeville Hydro Limited	3,664,133	3,687,355	0.63%	4,110,577	4,885,998	17.28%	7,774,710	8,573,353	9.78%
Oshawa PUC Networks Inc.	13,923,030	14,608,277	4.80%	24,901,005	30,361,104	19.83%	38,824,035	44,969,381	14.69%
Ottawa River Power Corporation	3,820,739	4,154,241	8.37%	3,073,786	3,684,454	18.12%	6,894,525	7,838,695	12.83%
PUC Distribution Inc.	10,989,235	12,628,187	13.90%	13,613,019	20,737,214	42.09%	24,602,254	33,365,402	30.47%
Renfrew Hydro Inc.	1,476,178	1,589,812	7.42%	1,328,170	1,637,346	20.93%	2,804,349	3,227,159	14.04%
Rideau St. Lawrence Distribution In	2,610,500	2,763,847	5.71%	1,400,340	1,675,179	17.92%	4,010,840	4,439,026	10.14%
Sioux Lookout Hydro Inc.	1,451,596	1,564,855	7.51%	984,062	1,146,181	15.25%	2,435,658	2,711,036	10.71%
Synergy North Corporation	19,510,824	19,053,314	-2.37%	23,578,310	28,434,670	18.73%	43,089,134	47,487,984	9.72%
Tillsonburg Hydro Inc.	2,840,459	2,846,612	0.22%	2,919,055	3,559,869	19.85%	5,759,514	6,406,481	10.65%
Toronto Hydro-Electric System Lim	264,587,694	272,554,835	2.97%	772,758,080	936,283,805	19.20%	1,037,345,775	1,208,838,641	15.30%
Wasaga Distribution Inc.	3,269,528	3,461,500	5.71%	4,375,929	5,464,224	22.21%	7,645,457	8,925,724	15.48%
Welland Hydro-Electric System Co	6,919,284	7,111,431	2.74%	6,074,177	7,341,487	18.95%	12,993,461	14,452,918	10.65%
Wellington North Power Inc.	1,929,965	2,320,071	18.41%	1,566,304	1,947,650	21.79%	3,496,268	4,267,721	19.94%
Westario Power Inc.	7,767,386	6,548,025	-17.08%	9,125,264	11,144,186	19.99%	16,892,650	17,692,210	4.62%
Average	**32,623,338**	**34,599,244**	**5.31%**	**61,294,809**	**74,788,935**	**19.07%**	**93,918,147**	**109,388,179**	**13.05%**
Median		**5.88%**	**4.70%**		**19.90%**	**18.54%**		**15.25%**	**12.71%**

Table 3a

Summary of 2023 Cost Performance Results

	Cost Efficiency Assessment						
	2020	2021	2022	2023	**2020-2022**	**2021-2023**	**Difference from 2020-2022**
Alectra Utilities Corporation	-4.4%	-6.9%	-9.1%	-9.7%	-6.8%	-8.6%	-1.8%
Algoma Power Inc.	61.9%	63.7%	61.1%	61.7%	62.2%	62.2%	-0.1%
Atikokan Hydro Inc.	2.8%	-0.9%	-1.9%	-6.0%	0.0%	-2.9%	-2.9%
Bluewater Power Distribution Corporation	-4.5%	-7.6%	-8.0%	-10.6%	-6.7%	-8.7%	-2.0%
Burlington Hydro Inc.	-13.0%	-11.7%	-13.5%	-10.0%	-12.8%	-11.7%	1.0%
Canadian Niagara Power Inc.	11.0%	11.8%	9.7%	13.2%	10.8%	11.6%	0.7%
Centre Wellington Hydro Ltd.	-11.2%	-16.7%	-16.6%	-18.9%	-14.8%	-17.4%	-2.6%
Chapleau Public Utilities Corporation	18.9%	4.0%	5.5%	9.0%	9.5%	6.2%	-3.3%
Cooperative Hydro Embrun Inc.	-54.7%	-62.4%	-72.8%	-68.0%	-63.3%	-67.7%	-4.4%
Elexicon Energy Inc.	-4.3%	-2.9%	-3.6%	-4.1%	-3.6%	-3.6%	0.1%
E.L.K. Energy Inc.	-59.0%	-49.1%	-32.4%	-37.6%	-46.8%	-39.7%	7.2%
Enova Power Corp.	-10.7%	-8.4%	-1.3%	-3.1%	-6.8%	-4.2%	2.5%
Entegrus Powerlines Inc.	-25.4%	-28.7%	-26.9%	-27.8%	-27.0%	-27.8%	-0.8%
ENWIN Utilities Ltd.	-15.3%	-22.4%	-26.8%	-27.8%	-21.5%	-25.7%	-4.2%
EPCOR Electricity Distribution Ontario Inc.	-9.8%	-16.5%	-16.0%	-19.9%	-14.1%	-17.4%	-3.4%
ERTH Power Corporation	-1.5%	-4.8%	-6.5%	-6.5%	-4.3%	-5.9%	-1.7%
Essex Powerlines Corporation	-23.8%	-31.6%	-31.6%	-31.7%	-29.0%	-31.6%	-2.7%
Festival Hydro Inc.	1.6%	-3.4%	-2.4%	-2.1%	-1.4%	-2.6%	-1.2%

Table 3a (cont'd)

Summary of 2023 Cost Performance Results

	Cost Efficiency Assessment						
	2020	2021	2022	2023	**2020-2022**	**2021-2023**	**Difference from 2020-2022**
Fort Frances Power Corporation	-11.4%	-12.8%	-11.0%	-11.2%	-11.7%	-11.7%	0.0%
GrandBridge Energy Inc.	-11.2%	-11.6%	-13.9%	-15.3%	-12.2%	-13.6%	-1.4%
Greater Sudbury Hydro Inc.	3.0%	1.4%	-3.8%	-6.9%	0.2%	-3.1%	-3.3%
Grimsby Power Incorporated	-34.5%	-38.5%	-38.5%	-39.7%	-37.2%	-38.9%	-1.7%
Halton Hills Hydro Inc.	-33.8%	-35.7%	-37.2%	-36.1%	-35.6%	-36.3%	-0.8%
Hearst Power Distribution Company Limited	-31.6%	-30.5%	-33.8%	-33.5%	-32.0%	-32.6%	-0.6%
Hydro 2000 Inc.	-18.0%	-16.8%	-14.8%	-20.5%	-16.5%	-17.4%	-0.8%
Hydro Hawkesbury Inc.	-66.4%	-65.3%	-71.0%	-63.6%	-67.6%	-66.6%	0.9%
Hydro One Networks Inc.	17.0%	18.1%	20.3%	21.5%	18.5%	20.0%	1.5%
Hydro Ottawa Limited	19.8%	19.5%	23.1%	24.4%	20.8%	22.4%	1.5%
Innpower Corporation	-6.8%	-5.2%	-6.2%	-0.8%	-6.1%	-4.1%	2.0%
Kingston Hydro Corporation	-6.8%	-12.8%	-10.9%	-15.0%	-10.2%	-12.9%	-2.7%
Lakefront Utilities Inc.	-27.2%	-27.0%	-31.0%	-24.9%	-28.4%	-27.6%	0.8%
Lakeland Power Distribution Ltd.	-16.9%	-19.6%	-16.8%	-16.1%	-17.7%	-17.5%	0.2%
London Hydro Inc.	-6.3%	-5.7%	-6.5%	-8.2%	-6.2%	-6.8%	-0.6%
Milton Hydro Distribution Inc.	-23.7%	-26.8%	-28.1%	-30.1%	-26.2%	-28.3%	-2.1%
Newmarket-Tay Power Distribution Ltd.	-15.9%	-17.6%	-17.5%	-18.1%	-17.0%	-17.8%	-0.7%
Niagara Peninsula Energy Inc.	-2.8%	-7.8%	-10.2%	-12.3%	-7.0%	-10.1%	-3.1%
Niagara-on-the-Lake Hydro Inc.	-12.7%	-13.1%	-16.2%	-15.5%	-14.0%	-14.9%	-0.9%

Table 3a (cont'd)

Summary of 2023 Cost Performance Results

	Cost Efficiency Assessment						
	2020	2021	2022	2023	**2020-2022**	**2021-2023**	**Difference from 2020-2022**
North Bay Hydro Distribution Limited	-2.2%	-3.6%	-3.5%	-4.9%	-3.1%	-4.0%	-0.9%
Northern Ontario Wires Inc.	-42.1%	-45.7%	-45.1%	-46.4%	-44.3%	-45.7%	-1.4%
Oakville Hydro Electricity Distribution Inc.	-3.8%	-6.4%	-6.6%	-7.5%	-5.6%	-6.8%	-1.2%
Orangeville Hydro Limited	-28.8%	-29.6%	-28.4%	-30.6%	-28.9%	-29.5%	-0.6%
Oshawa PUC Networks Inc.	-16.6%	-16.8%	-18.9%	-18.9%	-17.4%	-18.2%	-0.7%
Ottawa River Power Corporation	-24.3%	-28.8%	-25.6%	-26.3%	-26.2%	-26.9%	-0.7%
PUC Distribution Inc.	1.1%	1.8%	-3.0%	15.0%	0.0%	4.6%	4.6%
Renfrew Hydro Inc.	-2.5%	-3.1%	-8.4%	-5.7%	-4.7%	-5.7%	-1.1%
Rideau St. Lawrence Distribution Inc.	-15.4%	-15.4%	-11.3%	-15.8%	-14.0%	-14.2%	-0.1%
Sioux Lookout Hydro Inc.	-25.8%	-35.1%	-41.9%	-44.1%	-34.3%	-40.3%	-6.1%
Synergy North Corporation	0.5%	-0.8%	5.0%	2.1%	1.6%	2.1%	0.5%
Tillsonburg Hydro Inc.	-5.5%	-9.8%	-15.1%	-17.8%	-10.2%	-14.3%	-4.1%
Toronto Hydro-Electric System Limited	52.9%	53.2%	52.8%	52.9%	52.9%	52.9%	0.0%
Wasaga Distribution Inc.	-46.6%	-56.7%	-45.8%	-44.4%	-49.7%	-49.0%	0.7%
Welland Hydro-Electric System Corp.	-30.3%	-32.6%	-35.7%	-38.9%	-32.9%	-35.7%	-2.9%
Wellington North Power Inc.	2.9%	-4.0%	-9.8%	-5.3%	-3.6%	-6.4%	-2.7%
Westario Power Inc.	-11.1%	-10.3%	-6.2%	-14.6%	-9.2%	-10.4%	-1.2%
Average	**-11.6%**	**-13.8%**	**-14.2%**	**-14.3%**	**-13.2%**	**-14.1%**	**-0.9%**
Median	**-11.1%**	**-12.3%**	**-12.4%**	**-15.2%**	**-12.0%**	**-13.3%**	**-0.9%**
Max	**61.9%**	**63.7%**	**61.1%**	**61.7%**	**62.2%**	**62.2%**	**7.2%**
Min	**-66.4%**	**-65.3%**	**-72.8%**	**-68.0%**	**-67.6%**	**-67.7%**	**-6.1%**

Table 3b

Summary of the Impact of Revised Data on Cost Performance Results

Distributors with approved 2020, 2021, and/or 2022 data revisions for the 2023 data update	2020 Cost Performance			2021 Cost Performance			2022 Cost Performance			2020-2022 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**
Alectra Utilities Corporation	-4.4%	-4.4%	0.00%	-6.9%	na	na	-9.1%	na	na	-6.8%	-6.8%	**0.00%**
Algoma Power Inc.	61.9%	na	na	63.7%	na	na	61.1%	61.0%	0.05%	62.2%	62.2%	**0.02%**
Bluewater Power Distribution	-4.5%	-4.5%	0.00%	-7.6%	na	na	-8.0%	na	na	-6.7%	-6.7%	**0.00%**
Burlington Hydro Inc.	-13.0%	-13.0%	0.03%	-11.7%	na	na	-13.5%	na	na	-12.8%	-12.8%	**0.01%**
Chapleau Public Utilities	18.9%	na	na	4.0%	na	na	5.5%	0.0%	5.47%	9.5%	7.6%	**1.82%**
Entegrus Powerlines Inc.	-25.4%	-25.4%	0.00%	-28.7%	na	na	-26.9%	na	na	-27.0%	-27.0%	**0.00%**
Festival Hydro Inc.	1.6%	na	na	-3.4%	-3.4%	0.01%	-2.4%	na	na	-1.4%	-1.4%	**0.00%**
Greater Sudbury Hydro Inc.	3.0%	0.4%	2.65%	1.4%	-3.1%	4.44%	-3.8%	-7.9%	4.14%	0.2%	-3.5%	**3.74%**
Hydro 2000 Inc.	-18.0%	na	na	-16.8%	-16.8%	0.00%	-14.8%	na	na	-16.5%	-16.5%	**0.00%**
Hydro One Networks Inc.	17.0%	17.0%	0.01%	18.1%	18.0%	0.11%	20.3%	na	na	18.5%	18.4%	**0.04%**
Kitchener-Wilmot Hydro Inc.	-22.1%	-22.1%	0.00%	-18.2%	na	na	0.0%	na	na	-13.4%	-13.4%	**0.00%**
Newmarket-Tay Power	-15.9%	na	na	-17.6%	-17.5%	-0.10%	-17.5%	na	na	-17.0%	-17.0%	**-0.03%**
Oakville Hydro Electricity	-3.8%	-3.8%	0.00%	-6.4%	na	na	-6.6%	na	na	-5.6%	-5.6%	**0.00%**
Orangeville Hydro Limited	-28.8%	-28.8%	0.00%	-29.6%	-29.6%	0.04%	-28.4%	na	na	-28.9%	-28.9%	**0.01%**
Oshawa PUC Networks Inc.	-16.6%	-16.4%	-0.25%	-16.8%	-16.8%	-0.02%	-18.9%	-18.9%	-0.02%	-17.4%	-17.3%	**-0.10%**
Ottawa River Power Corporation	-24.3%	na	na	-28.8%	na	na	-25.6%	-25.7%	0.03%	-26.2%	-26.2%	**0.01%**
Rideau St. Lawrence Distribution	-15.4%	-15.4%	-0.01%	-15.4%	na	na	-11.3%	na	na	-14.0%	-14.0%	**0.00%**
Waterloo North Hydro Inc.	3.5%	3.4%	0.04%	4.2%	na	na	0.0%	na	na	2.5%	2.5%	**0.01%**

* The impact of revisions are not cumulative with revisions from previous updates. Other submitted changes were either not used in the 2020-2022 calculations or resulted in no net change to the amounts being used.

Table 4

Summary of Stretch Factor Assignments

	2020-2022		2021-2023		Change in Stretch Factor
	Benchmarking Performance	Stretch Factor	Benchmarking Performance	Stretch Factor	
Alectra Utilities Corporation	-6.8%	0.30	-8.6%	0.30	NO
Algoma Power Inc.	62.2%	0.60	62.2%	0.60	NO
Atikokan Hydro Inc.	0.0%	0.30	-2.9%	0.30	NO
Bluewater Power Distribution Corporation	-6.7%	0.30	-8.7%	0.30	NO
Burlington Hydro Inc.	-12.8%	0.15	-11.7%	0.15	NO
Canadian Niagara Power Inc.	10.8%	0.45	11.6%	0.45	NO
Centre Wellington Hydro Ltd.	-14.8%	0.15	-17.4%	0.15	NO
Chapleau Public Utilities Corporation	9.5%	0.30	6.2%	0.30	NO
Cooperative Hydro Embrun Inc.	-63.3%	0.00	-67.7%	0.00	NO
Elexicon Energy Inc.	-3.6%	0.30	-3.6%	0.30	NO
E.L.K. Energy Inc.	-46.8%	0.00	-39.7%	0.00	NO
Enova Power Corp.	-6.8%	0.30	-4.2%	0.30	NO
Entegrus Powerlines Inc.	-27.0%	0.00	-27.8%	0.00	NO
ENWIN Utilities Ltd.	**-21.5%**	**0.15**	**-25.7%**	**0.00**	**YES**
EPCOR Electricity Distribution Ontario Inc.	-14.1%	0.15	-17.4%	0.15	NO
ERTH Power Corporation	-4.3%	0.30	-5.9%	0.30	NO
Essex Powerlines Corporation	-29.0%	0.00	-31.6%	0.00	NO
Festival Hydro Inc.	-1.4%	0.30	-2.6%	0.30	NO
Fort Frances Power Corporation	-11.7%	0.15	-11.7%	0.15	NO
GrandBridge Energy Inc.	-12.2%	0.15	-13.6%	0.15	NO

Table 4 (cont'd)
Summary of Stretch Factor Assignments

	2020-2022		2021-2023		Change in Stretch Factor
	Benchmarking Performance	Stretch Factor	Benchmarking Performance	Stretch Factor	
Greater Sudbury Hydro Inc.	0.2%	0.30	-3.1%	0.30	NO
Grimsby Power Incorporated	-37.2%	0.00	-38.9%	0.00	NO
Halton Hills Hydro Inc.	-35.6%	0.00	-36.3%	0.00	NO
Hearst Power Distribution Company Limited	-32.0%	0.00	-32.6%	0.00	NO
Hydro 2000 Inc.	-16.5%	0.15	-17.4%	0.15	NO
Hydro Hawkesbury Inc.	-67.6%	0.00	-66.6%	0.00	NO
Hydro One Networks Inc.	18.5%	0.45	20.0%	0.45	NO
Hydro Ottawa Limited	20.8%	0.45	22.4%	0.45	NO
Innpower Corporation	-6.1%	0.30	-4.1%	0.30	NO
Kingston Hydro Corporation	-10.2%	0.15	-12.9%	0.15	NO
Lakefront Utilities Inc.	-28.4%	0.00	-27.6%	0.00	NO
Lakeland Power Distribution Ltd.	-17.7%	0.15	-17.5%	0.15	NO
London Hydro Inc.	-6.2%	0.30	-6.8%	0.30	NO
Milton Hydro Distribution Inc.	-26.2%	0.00	-28.3%	0.00	NO
Newmarket-Tay Power Distribution Ltd.	-17.0%	0.15	-17.8%	0.15	NO
Niagara Peninsula Energy Inc.	**-7.0%**	**0.30**	**-10.1%**	**0.15**	**YES**
Niagara-on-the-Lake Hydro Inc.	-14.0%	0.15	-14.9%	0.15	NO
North Bay Hydro Distribution Limited	-3.1%	0.30	-4.0%	0.30	NO
Northern Ontario Wires Inc.	-44.3%	0.00	-45.7%	0.00	NO

Table 4 (cont'd)
Summary of Stretch Factor Assignments

	2020-2022		2021-2023		Change in Stretch Factor
	Benchmarking Performance	Stretch Factor	Benchmarking Performance	Stretch Factor	
Oakville Hydro Electricity Distribution Inc.	-5.6%	0.30	-6.8%	0.30	NO
Orangeville Hydro Limited	-28.9%	0.00	-29.5%	0.00	NO
Oshawa PUC Networks Inc.	-17.4%	0.15	-18.2%	0.15	NO
Ottawa River Power Corporation	-26.2%	0.00	-26.9%	0.00	NO
PUC Distribution Inc.	0.0%	0.30	4.6%	0.30	NO
Renfrew Hydro Inc.	-4.7%	0.30	-5.7%	0.30	NO
Rideau St. Lawrence Distribution Inc.	-14.0%	0.15	-14.2%	0.15	NO
Sioux Lookout Hydro Inc.	-34.3%	0.00	-40.3%	0.00	NO
Synergy North Corporation	1.6%	0.30	2.1%	0.30	NO
Tillsonburg Hydro Inc.	-10.2%	0.15	-14.3%	0.15	NO
Toronto Hydro-Electric System Limited	52.9%	0.60	52.9%	0.60	NO
Wasaga Distribution Inc.	-49.7%	0.00	-49.0%	0.00	NO
Welland Hydro-Electric System Corp.	-32.9%	0.00	-35.7%	0.00	NO
Wellington North Power Inc.	-3.6%	0.30	-6.4%	0.30	NO
Westario Power Inc.	**-9.2%**	**0.30**	**-10.4%**	**0.15**	**YES**

Table 5

Stretch Factor Assignments by Group

Group I (17 Distributors)		**Group II** (15 Distributors)		**Group III** (17 Distributors)		**Group IV** (3 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.	Lakefront Utilities Inc.	Burlington Hydro Inc.	Newmarket-Tay Power Distribution Ltd.	Alectra Utilities Corporation	Innpower Corporation	Canadian Niagara Power Inc.	Algoma Power Inc.
E.L.K. Energy Inc.	Milton Hydro Distribution Inc.	Centre Wellington Hydro Ltd.	Niagara-on-the-Lake Hydro Inc.	Atikokan Hydro Inc.	London Hydro Inc.	Hydro One Networks Inc.	Toronto Hydro-Electric System Limited
Entegrus Powerlines Inc.	Northern Ontario Wires Inc.	EPCOR Electricity Distribution Ontario Inc.	**Niagara Peninsula Energy Inc.**	Bluewater Power Distribution Corporation	North Bay Hydro Distribution Limited	Hydro Ottawa Limited	
ENWIN Utilities Ltd.	Orangeville Hydro Limited	Fort Frances Power Corporation	Oshawa PUC Networks Inc.	Chapleau Public Utilities Corporation	Oakville Hydro Electricity Distribution Inc.		
Essex Powerlines Corporation	Ottawa River Power Corporation	GrandBridge Energy Inc.	Rideau St. Lawrence Distribution Inc.	Elexicon Energy Inc.	PUC Distribution Inc.		
Grimsby Power Incorporated	Sioux Lookout Hydro Inc.	Hydro 2000 Inc.	Tillsonburg Hydro Inc.	Enova Power Corp.	Renfrew Hydro Inc.		
Halton Hills Hydro Inc.	Wasaga Distribution Inc.	Kingston Hydro Corporation	**Westario Power Inc.**	ERTH Power Corporation	Synergy North Corporation		
Hearst Power Distribution Company Limited	Welland Hydro-Electric System Corp.	Lakeland Power Distribution Ltd.		Festival Hydro Inc.	Wellington North Power Inc.		
Hydro Hawkesbury Inc.				Greater Sudbury Hydro Inc.			