

Activity and Program-based Benchmarking (APB)

OEB Stakeholder Meeting
APB Initiative Update and Implementation
May 13, 2021

Purpose

- Provide an overview of APB results and the OEB's expected use of APB to support rate setting
- Outline how APB can serve as a tool in various rate applications processes
- Discuss data required for reporting
- Receive feedback

Agenda

1. Recap of Previous APB Stakeholder Consultation
2. APB Benchmarking Update and Results (PEG Report)
3. Potential Uses of APB in Rate Application Process
4. Data Requirements for Reporting
5. Advancing APB
6. Questions and Answers Session

Recap of Previous APB Stakeholder Consultation

Section 1

Stakeholder Consultation

October 2018

- Three sessions with working group held to review OEB staff work on best practices and activity/program selection process.
- Short data survey was conducted to determine the availability of data from distributors for programs.

February 2019

- OEB staff discussion paper provided an APB framework supported by a Pacific Economics Group (PEG) report.
- Overall positive stakeholder support received for APB.

Comments – APB Value Proposition

Positive feedback from utilities and customer groups

- Actionable intelligence regarding specific aspects of operations
- Quantitative data analysis is an essential management tool
- Customers expect distributors to improve their efficiency without knowing details
- Access to greater information on areas for improvement
- Support for the OEB initiating APB and promoting continuous improvement

Comments – Positions on Key Elements

Utilities and customer groups in general agreement

- Support for the preliminary list of programs/activities.
- Support for the phased-in approach starting with short list.
- Many endorsed unit-cost methodology, for the simplicity.
- Most not opposed to new data but requested the OEB review the value of additional information.

Short List

- Reducing activities/programs to 10 from 19 may allow more focused implementation and lessons learned can be applied to future refinements
- Six OM&A and four capital activities/programs of significance; represent 40% of total OM&A expenses and 47% of total gross capital balances (six-year averages), respectively

OM&A	Group 1 Average Costs - OM&A (\$ M)	Capital	Group 1 Average Costs – Gross Capital (\$ M)
Vegetation management (Right of Way)	161	Poles, Towers and Fixtures	4,713
Billing	124	Transformers (excludes station transformers)	3,898
Meter Expense	81	Distribution station equipment	1,919
Line operation and maintenance	190	Meters	1,326
Distribution Station Equipment	50		
Maintenance Poles, Towers and Fixtures	29		

Unit Cost Benchmarking – Primary Method

- The OEB has determined that unit cost benchmarking is the primary method to be used for APB.
- Unit cost allows for simplicity, utility ease of replication, data availability and stakeholder understandability.
- A key benefit of this approach is that unit cost can provide the necessary information to drive utility behavior while econometric benchmarking provides a reasonability check on the results of the unit cost.
- As such, econometrics play a supporting role to enhance unit cost accuracy and usability where possible.
- Overall, the unit cost approach promotes greater acceptance of the benchmarking results.

APB Benchmarking Update and Results (PEG Report)

Section 2

Data Request - Questionnaire Survey



By letter of November 12, 2020, the OEB indicated to stakeholders that it was going forward with the APB initiative and issued a Questionnaire consisting of eight questions on data elements to distributors to complete the APB benchmarking for ten programs



The criteria used to identify what data should be requested were that it should be reasonably easy for distributors to access, not already provided to the OEB, and have a high probability of improving the benchmarking models



All distributors submitted responses, but some did not provide the requested data in certain areas (e.g., asset age)



OEB staff also made use of previously collected data in rate applications to reduce reporting burden (e.g., extracted data from fixed assets continuity schedules)



Staff compiled the questionnaire data submitted and provided to project consultant PEG

PEG Update to Previous Benchmarking

- The new data also made it possible to develop scale index (e.g., combining number of poles and number of customers to create an index) to improve the quality of the unit cost benchmarking.
- Unit cost and econometric benchmarking results were calculated for each of the ten programs shortlisted.
- PEG produced a report with an update on its work and improved results (posted March 30 revised May 11).
- Many of the new business condition variables available from the new data were found to be statistically significant cost drivers in the new econometric models.

Benchmarking Results Reported by PEG

- Unit cost results

- Unit cost calculations were done for each distributor for each of the most recent three years for which data are available (2017, 2018, 2019). A unit cost index is the ratio of a cost index to a scale index. Most of the unit cost programs featured only one scale variable. For example, for Poles and Fixtures OM&A, if cost is \$500k and number of poles is 5k, the cost index is presented in dollars and the scale is the number of poles. The unit cost is dollars per pole. In this example, \$100 per pole ($\$500\text{k}/5\text{k}$).

Benchmarking Results Reported by PEG

- Econometric results
 - The econometric model produces cost predictions for each year for each distributor. Linear regression analysis is performed to calculate the relationship between a dependent variable (e.g., capital cost for poles) and explanatory variables (e.g., number of poles, km per pole, % poles over 50 years old, average number of customers added) to predict the cost for a program.
 - The effects of the explanatory variables on cost are that higher values of km per pole are associated with more fixtures and higher values of the percent of poles over 50 years old imply a greater probability that poles will need to be replaced. Higher customer growth is correlated with an expansion of the area served which increases the number of poles needed.

Benchmarking Results Reported by PEG

- Econometric results
 - The R-squared statistic summarizes how well the explanatory variables (inputs in the model) explain the variation in cost for a program (i.e., the explanatory power). For the poles capex program, the R-squared is 0.7 (or 70%). That is to say, the independent variables explained about 70% of the observed pole capex.
 - The other 30% can be attributed to other reasons including management performance and explanatory variables not included in the model.

Benchmarking Results Reported by PEG



The new data requested improved both the accuracy of the results of the models and their sophistication in linking benchmarks to cost drivers



Two metrics are used to determine the explanatory power of the results - “R-squared” and “% of companies within 50%” of benchmark performance – generally, the higher their values are the higher the statistical acceptance of the results



The benchmarking update showed improvements to explanatory power from the previous results. The improvements overall were better for the capex models than for the OM&A models



The next slide shows the overall improvements to updated econometric benchmarking of the 10 programs on a sector-wide basis

Econometrics Benchmarking Results Reported by PEG Table 2 (per May 11, 2021, revision)

Model	Previous Results		Current Results		Improvement	
	R-squared value	% of companies within 50%	R-squared value	% of companies within 50%	R-squared value	% of companies within 50%
Billing O&M	0.870	79%	0.888	71%	0.018	-8%
Poles, Towers, and Fixtures O&M	0.462	52%	0.496	46%	0.034	-6%
Line O&M	0.867	49%	0.884	68%	0.017	19%
Metering O&M	0.749	37%	0.839	66%	0.090	29%
Vegetation Management O&M	0.818	69%	0.856	53%	0.038	-16%
Station Equipment O&M	0.680	30%	0.794	57%	0.114	27%
Poles, Towers, and Fixtures Capex	0.698	63%	0.851	69%	0.153	6%
Station Capex	0.376	22%	0.490	30%	0.114	8%
Line Transformer Capex	0.813	22%	0.885	83%	0.072	61%
Meter Capex	0.594	37%	0.678	62%	0.084	25%
Average	0.693	46%	0.766	60%	0.074	14%

Benchmarking Results Reported by PEG

- Unit cost or econometric benchmarking provides for a better result (on a sector-wide basis) for a benchmarked program where more distributors are “within 50%” of the benchmark performance. The benchmark performance for the econometric models is the % of distributors that are within 50% of the *predicted* cost, and for unit cost it is the % of distributors that are within 50% of the sector’s *average* unit cost.
- This measure gives an indication of the dispersion of benchmarking outcomes, which provides the notion of overall comparability across the sector. The comparability across the sector can be challenging where there is a wide dispersion (i.e., most are not within 50%) thus comparisons are more questionable.
- Overall R-squared average of the ten programs is 77% (0.77), but Poles and Fixtures O&M and Station Capex are at 50% (0.5) each.

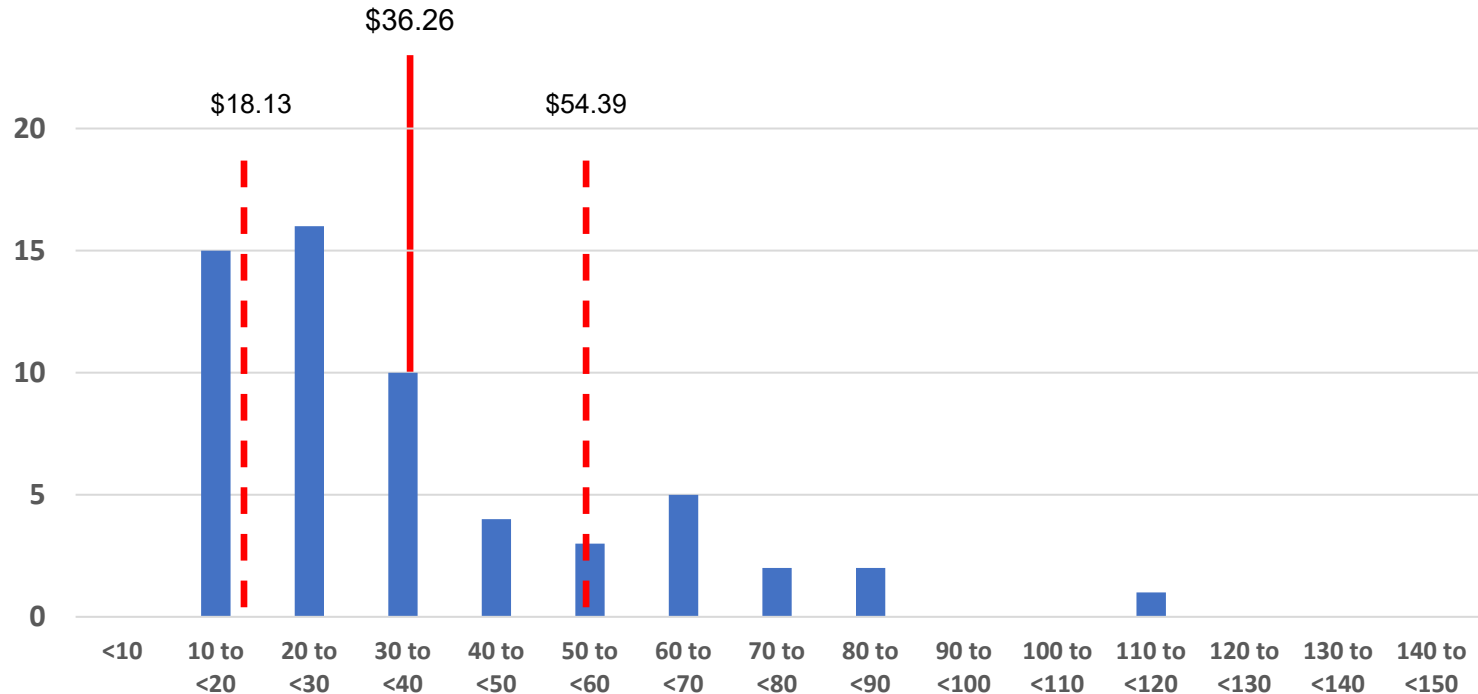
Benchmarking Results Reported by PEG Table 3 (per May 11, 2021, revision)

Model	Econometric Results	Unit Cost Results
	% of companies within 50% of Predicted Cost	% of companies within 50% of Average Unit Cost
Billing O&M	71%	60%
Poles, Towers, and Fixtures O&M	46%	42%
Line O&M	68%	66%
Metering O&M	66%	71%
Vegetation Management O&M	53%	70%
Station Equipment O&M	57%	43%
Poles, Towers, and Fixtures Capex	69%	62%
Station Capex	30%	22%
Line Transformer Capex	83%	72%
Meter Capex	62%	64%
Average	60%	57%

Benchmarking Results Reported by PEG

- The previous slide shows the overall econometric benchmarking and unit cost results on a sector-wide basis for the 10 programs. On average, 60% and 57% of distributors are “within 50%” for econometric benchmarking and unit cost, respectively.
- The key takeaway is that most of the 10 programs have high results (i.e., most distributors are “within 50%” of benchmark performance).
- The Station Capex is recommended for limited use at time as the results are low. Further refinements to this program are needed to improve the results in the future.
- The key reason attributable to the lower results of some programs was due to limited available data resulting in weaker explanatory variables for the models. Further assessment of key cost drivers needs future consideration and input from stakeholders.

Billing O&M



Analysis of Results

- 35 LDCs (60%) have unit costs “within 50%” of the average unit cost of ~\$36
- 41 LDCs (71%) have unit costs “within 50%” of the median unit cost of ~\$29

Benchmarking Results Reported by PEG

- All ten programs have their own separate benchmarking tables for both unit cost and econometric models showing data and results for all distributors.
- The PEG report tables are also available in Excel posted on the OEB web for use by stakeholders.
- Some tables may contain no data/results because either the program did not apply to the distributor (such as distribution station equipment) or the distributor may have not filed the requested data.

Data Quality Issues

- Reporting consistent and accurate data is critical to achieving robust benchmarking results.
- The accounting classification/itemization of costs to the underlying account(s) used for OM&A programs are of concern in some areas.
- Examples of specific issues are:
 - Not allocating/reporting pension and 'burden' costs in OM&A accounts
 - High usage of miscellaneous or supervision accounts rather than applicable OM&A accounts
 - Reporting zeros for some key cost categories
- These issues require the ongoing attention of distributors with a view to correct the accounting and/or refile correct data in the RRRs.
- Where a distributor did not provide data or appropriate data in the questionnaire, a choice was made between proceeding with estimates where reasonable values could be obtained or not benchmark the distributor missing the data.

APB in Rate Application Process and Other Uses

Section 3

APB usage in Rate Applications Process

- ✓ New tool on cost performance at granular program level (see the trees from the forest) compared to total cost benchmarking – TCB.
- ✓ Review of distributors cost performance across the programs and comparisons to the sector.
- ✓ Use as an information tool to inform review of applications.
- ✓ Use as a learning tool that can be enhanced over time with refinements to better understand program cost performance.
- ✓ The filing requirements are expected to be amended to require applicants to provide commentary of their APB results in future rate applications (i.e., not already filed).

Uses of APB as a Tool

- ✓ Use as a screening tool in application reviews in the future
 - Can serve as early identification of specific programs (if any) that may warrant further review
 - Acts as a screening tool to help determine where to focus effort and areas that are not worth spending much effort
- ✓ Use as an inquiry tool (to review areas of cost performance interest after an application is filed)
 - Self-comparison: trend of the three-year performance (e.g., graph and slope of results as to whether the performance is improving or declining)
 - Where does a distributor's performance rate on year-over-year basis in context of continuous improvements?
 - Comparison to the sector: a distributor's current performance to the industry's average performance
 - Where does a distributor's performance rate compare to industry/top performers?

Use of APB as an Inquiry Tool

- ✓ As an inquiry tool, there are many approaches that can be used to review and analyze the program results.
- ✓ Use of the report tables in Excel (posted on OEB web) provides opportunities to analyze the results.
- ✓ There are several ways to consider when doing analysis of the results. These can be applied to the tables in the excel file provided. For example:
 - Ranking analysis of a distributor's cost performance ranking compared to the others in the sector (e.g., sorted by low to high costs in Excel)
 - Other analyses or metrics can be considered (e.g., ranking by quartiles)

Comparative Analysis Example: Unit Cost

The following examples in the next few slides show how analysis can be applied to the results tables using the Excel file provided in the OEB web.

- These examples are for illustrative purposes only and not suggestive of any methods or criteria for analyzing the data results in order to raise issues or inquiries about a distributor's cost performance.
- They are intended just to cite other analyses on how the data can be used in furtherance of the result tables provided in the PEG report.

Comparative Analysis Example: Unit Cost

Program costs can be sorted by low to high in Excel (partial table example below shows five lowest and five highest cost performers)

Table 4

Unit Cost Indexes by Distributor: Billing O&M



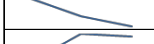

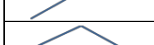

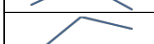

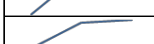



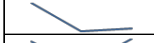

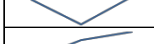

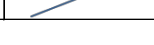

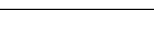

Cost (\$1,000)				Scale (1,000 customers)				Unit Cost (\$ / customer)			
2017	2018	2019	Average	2017	2018	2019	Average	2017	2018	2019	Average
1,865	1,712	1,867	1,814	157.2	159.0	160.6	158.9	\$ 11.86	\$ 10.76	\$ 11.62	\$ 11.42
846	799	813	819	67.1	67.9	68.2	67.8	\$ 12.61	\$ 11.76	\$ 11.92	\$ 12.09
352	326	357	345	27.6	27.7	27.8	27.7	\$ 12.77	\$ 11.80	\$ 12.85	\$ 12.48
550	446	476	491	33.6	33.6	33.6	33.6	\$ 16.37	\$ 13.28	\$ 14.15	\$ 14.60
169	160	190	173	11.7	11.7	11.7	11.7	\$ 14.39	\$ 13.62	\$ 16.21	\$ 14.74
459	464	500	474	7.2	7.1	7.1	7.2	\$ 63.70	\$ 65.08	\$ 70.13	\$ 66.31
279	293	312	295	4.3	4.3	4.3	4.3	\$ 65.00	\$ 68.01	\$ 72.16	\$ 68.39
259	192	199	217	2.8	2.8	2.8	2.8	\$ 91.02	\$ 67.49	\$ 69.98	\$ 76.16
213	201	207	207	2.7	2.7	2.7	2.7	\$ 79.08	\$ 74.70	\$ 76.50	\$ 76.76
181	190	205	192	2.2	2.3	2.4	2.3	\$ 80.87	\$ 82.43	\$ 86.79	\$ 83.36
136	137	138	137	1.6	1.6	1.6	1.6	\$ 82.92	\$ 83.93	\$ 84.88	\$ 83.91
138	138	157	144	1.3	1.3	1.2	1.3	\$ 109.75	\$ 109.65	\$ 125.97	\$ 115.13
\$ 2,206				88.84				\$ 36.26			

Comparative Analysis Example: Unit Cost

Self-comparison: three-year performance trend (e.g., graph & slope results - partial Excel table example below)

Table 13

Unit Cost Indexes by Distributor: Meter O&M













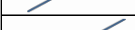







Cost (\$1,000)				Scale (1,000 customers)				Unit Cost (\$ per customer)						
2017	2018	2019	Average	2017	2018	2019	Average	2017	2018	2019	3-year Trend	Slope	Average	
13,909	15,665	9,045	12,873	982.0	991.1	1,054.6	1,009.2	\$ 14.16	\$ 15.81	\$ 8.58			\$ 12.85	
966.8	877.3	829.7	891.3	11.7	11.7	11.7	11.7	\$ 82.46	\$ 74.85	\$ 70.72			\$ 76.01	
81.2	86.2	85.2	84.2	1.6	1.6	1.6	1.6	\$ 49.60	\$ 52.66	\$ 52.32			\$ 51.53	
764.0	813.2	759.3	778.8	36.6	36.7	36.7	36.7	\$ 20.88	\$ 22.16	\$ 20.67			\$ 21.24	
823.3	886.9	874.3	861.5	39.6	39.9	40.1	39.9	\$ 20.78	\$ 22.23	\$ 21.79			\$ 21.60	
182.6	224.9	232.2	213.3	13.6	13.8	14.0	13.8	\$ 13.44	\$ 16.31	\$ 16.59			\$ 15.44	
777.7	791.7	867.4	812.2	57.0	57.5	57.9	57.5	\$ 13.63	\$ 13.77	\$ 14.99			\$ 14.13	
426.2	273.0	291.4	330.2	23.0	23.4	23.7	23.4	\$ 18.49	\$ 11.68	\$ 12.31			\$ 14.16	
156.7	147.2	160.4	154.7	3.8	3.8	3.8	3.8	\$ 41.56	\$ 38.68	\$ 41.87			\$ 40.71	
520.3	547.0	562.8	543.4	23.4	23.5	23.8	23.6	\$ 22.26	\$ 23.23	\$ 23.67			\$ 23.05	
			\$ 1,337				88.8	Average						\$ 19.67

Comparative Analysis Example: Unit Cost

Self-comparison: three-year performance trend (e.g., graph, slope & **higher than average** results-partial Excel table example below)

Table 13

Unit Cost Indexes by Distributor: Meter O&M

Cost (\$1,000)				Scale (1,000 customers)				Unit Cost (\$ per customer)						
2017	2018	2019	Average	2017	2018	2019	Average	2017	2018	2019	3-year Trend	Slope	Average	
13,909	15,665	9,045	12,873	982.0	991.1	1,054.6	1,009.2	\$ 14.16	\$ 15.81	\$ 8.58			\$ 12.85	
966.8	877.3	829.7	891.3	11.7	11.7	11.7	11.7	\$ 82.46	\$ 74.85	\$ 70.72			\$ 76.01	
81.2	86.2	85.2	84.2	1.6	1.6	1.6	1.6	\$ 49.60	\$ 52.66	\$ 52.32			\$ 51.53	
764.0	813.2	759.3	778.8	36.6	36.7	36.7	36.7	\$ 20.88	\$ 22.16	\$ 20.67			\$ 21.24	
823.3	886.9	874.3	861.5	39.6	39.9	40.1	39.9	\$ 20.78	\$ 22.23	\$ 21.79			\$ 21.60	
182.6	224.9	232.2	213.3	13.6	13.8	14.0	13.8	\$ 13.44	\$ 16.31	\$ 16.59			\$ 15.44	
777.7	791.7	867.4	812.2	57.0	57.5	57.9	57.5	\$ 13.63	\$ 13.77	\$ 14.99			\$ 14.13	
426.2	273.0	291.4	330.2	23.0	23.4	23.7	23.4	\$ 18.49	\$ 11.68	\$ 12.31			\$ 14.16	
156.7	147.2	160.4	154.7	3.8	3.8	3.8	3.8	\$ 41.56	\$ 38.68	\$ 41.87			\$ 40.71	
520.3	547.0	562.8	543.4	23.4	23.5	23.8	23.6	\$ 22.26	\$ 23.23	\$ 23.67			\$ 23.05	
\$ 1,337				88.8				Average						\$ 19.67

Econometric vs Unit Cost Insights

- Econometric models provide us with a view of “how much in total” do we estimate a utility should be investing in a program/activity based on the business conditions captured by the explanatory variables
 - E.g., Total CAPEX on poles.
- Unit Cost results tell us if the investment on a per unit basis is high or low.
 - E.g., Cost per pole
- Econometric and unit cost results may or may not align depending on input prices, business conditions, economies of scale, and accuracy of the estimated parameters.

Data Requirements for Reporting

Section 4

Summary of APB Data for Reporting

- New limited data requirements are needed for reporting in 2022 to support annual programs benchmarking in RRRs.
- In comparison to the data requested in the questionnaire, only a limited quantity of data is required going forward for the 10 programs.
- RRR annual data to be filed to include pension allocation, billing and station maintenance outsourcing indicators, number of stations, station transformers, station capacity (MVA), number and type of poles, asset age, percentage of vegetation work completed, and capital expenditure additions (via Appendix 2BA - Fixed Asset Continuity Schedule).
- The next slide provide summary breakdowns of the data needed by the programs.

Summary of APB Data for Reporting

No.	Activity / Program	Existing RRR Data Used	Combined Overall New RRR Needed for APB
1	Billing OM&A	2.1.2, 2.1.5, 2.1.7	Outsourcing indicator (Y/N) Pension allocation (applicable to all OM&A programs)
2	Metering OM&A	2.1.2, 2.1.7	Number of poles
3	Vegetation Management OM&A	2.1.5, 2.1.7	Number of poles, percentage work completed
4	Line OM&A	2.1.2, 2.1.7	Number of poles, asset age
5	Station Equipment OM&A	2.1.7	Number of stations, station capacity (MVA), outsourcing indicator (Y/N)
6	Poles, Towers, and Fixtures OM&A	2.1.7	Number of poles, types of pole, asset age
7	Meter Capex	2.1.2, 2.1.5	Capital asset additions
8	Station Capex	None	Number of stations, number of station transformers, capital asset additions
9	Line Transformer Capex	2.1.2, 2.1.5	Capital asset additions
10	Poles, Towers, and Fixtures Capex	2.1.2	Number of poles, asset age, capital asset additions

Advancing APB

Section 5

Advancing APB

In light of the mandate to look for efficiency in its processes, as well as the opportunity to use benchmarking to drive better utility performance, the OEB's goal is to use APB to benefit consumers and utilities by:

- Driving improved industry performance
- Improving regulatory effectiveness through the establishment of clear outcomes
- Encouraging utilities to continuously improve and innovate customer service
- Enabling a more efficient regulatory process, both internally and for applicants, as well as being innovative in regulatory approach.

Advancing APB

- Implementing the APB framework includes a continuous improvements cycle:
 - Addressing stakeholder feedback (questions and issues, etc.)
 - Identifying if additional scale or business condition variables may be needed to improve results
 - Exploring benchmarking refinements (e.g., to improve program results particularly those with poor results)
 - Provide more clarity or better data definition to improve the data quality (e.g., asset age or vegetation management)

Advancing APB

Best practices opportunity for distributors:

- To learn from each other by sharing information to become more cost effective (e.g., suppliers of goods or services)
- To spur innovation (e.g., to improve processes)
- To provide better value of service to customers
- To help improve the regulatory review process of rate applications (focused approach to specific programs, if any, in evidence provided)

Advancing APB

Expected outcomes from use of APB

- Enable better analysis and understanding of what factors/drivers may have contributed to the cost performances of distributors
- Enable distributors to take potential remedial action to address any concerns
- Enable distributors to input APB into their planning processes, such as financial planning and budgets, asset management / distributor system plans (DSP)
- Finding efficiencies to enable continuous improvements

Questions and Answers Session

Section 6

Inquiries or Comments

Inquiries or any feedback on APB should be directed to Industry Relations at **IndustryRelations@oeb.ca**

APB Stakeholder Meeting

Thank you