

Hydro One Stakeholder Session
October 5th, 2016
DoubleTree Hotel by Hilton – The Toronto Ballroom
108 Chestnut Street
8:30am – 4:30pm

OVERVIEW

On October 5th, 2016 Hydro One Networks Inc. hosted a full-day stakeholder session. The purpose of this meeting was to present and discuss the preliminary findings and recommendations of the following studies:

1. Total Factor Productivity
2. Vegetation Management Program
3. Pole Replacement Program
4. Distribution Station Refurbishment Program.

The stakeholder session included:

- Opening Remarks from Oded Hubert (Vice President, Regulatory Affairs, Hydro One Networks);
- Welcoming remarks from Maxine Cooper (Senior Regulatory Advisor, Hydro One Networks);
- A presentation on the Preliminary Findings and Recommendations of the Total Factor Productivity Study, delivered by Steve Fenrick (Power Systems Engineering); and
- A presentation on the Preliminary Findings and Recommendations of the Vegetation Management Program Study, delivered by William Porter (CN Utility Consultants);
- Two presentations on the Preliminary Findings and Recommendations of the Replacement Program and Distribution Station Refurbishment Program Study by Benjamin Grunfeld (Navigant Consulting) and Ken Buckstaff (First Quartile Consulting).

This summary was written by Dave Hardy and Jeremiah Pariag, who provided independent facilitation services for the stakeholder session. It provides a high level summary of the main points shared by participants as captured in the “live” notes written during the meeting, and is not intended as a verbatim transcript of the meeting.

Note that there are two appendices to this summary (attached separately), including:

- Appendix 1. List of Participants
- Appendix 2. Presentation Slides

Presentation #1 – Total Factor Productivity Study

Steve Fenrick from Power Systems Engineering delivered an overview presentation that described the Preliminary Findings and Recommendations of the Total Factor Productivity Study. Following Steve's presentation, Dave Hardy facilitated a discussion during which participants asked questions of clarification and provided feedback. A summary of the questions and feedback is provided below.

Please note that responses provided to questions and comments are noted in *italics* immediately following each question or comment.

Questions of Clarification

- How much have the Electric Utility Construction Price Index (EUCPI) and Handy-Whitman Index (HWI) varied from each other? *They vary over time. Handy-Whitman has escalated faster than the EUCPI, but from year to year, it is dependent on interest rates. EUCPI is sensitive to interest rates, whereas Handy-Whitman does not incorporate rates.*
- In regards to slide 11, are the numbers shown adjusted or unadjusted? *The numbers shown on this slide are unadjusted.*
- If the utility was selling less power, would this decrease the Total Factor Productivity (TFP)? *Yes, this is possible.*
- Would the TFP be lowered if costs were fixed and less power was sold? *Yes, but in the output index, customers are given more weight than sales. Note: Weights have been determined by the OEB study.*
- Does conservation spending go towards the capital budget? *No.*
- In the consultation leading to the 4th gen, Toronto Hydro and Hydro One were significant outliers. Moving to 2015, were Toronto Hydro and Hydro One pulled out? *The numbers presented do not include Toronto Hydro and Hydro One*
- Both the System Average Interruption Frequency Index (SAIFI) and the Customer Average Interruption Duration Index (CAIDI) are being used in the presentation, why is the System Average Interruption Duration Index (SAIDI) not included? *SAIDI is implicitly included in the two overall components. (SAIDI = average duration time of outages in time for a customer, SAIFI = frequency of outages, CAIDI = average duration time per outage)*
- Have any adjustments been made to the figures presented? *Loss of supply was not included. Major event days were also not included because this could skew the index. Power supply outages were not included.*
- What are you measuring for outputs for safety? *Outputs for safety are measured by the number of recordable injuries per 200,000 hours worked.*
- Lots of things are outputs, safety is different. How prevalent is including a variable like this in the US? Much of the data is not public. *This may be the first application of incorporating safety and reliability into the TFP trend.*
- What justification do you have for using the Lawrence Berkeley National Laboratory paper as opposed to others? *The Lawrence Berkeley National Laboratory paper was used for the US Department of Energy and seems very reliable. It provides a good starting point for pricing outages and reliability for the TFP.*
- In the report that will be produced, will a more detailed analysis be done in regards to interpretation of negative TFP and how other factors are assessed, like the impact of distributed generation (DG)? *Many costs directly related to the cost of DG are not*

included because it is not part of the 4th Generation Incentive Rate-setting method (4GIR), but it is difficult to calculate the cost.

- *Are scheduled outages included? Yes, scheduled outages are included because the customer's experience would be the same for both planned and unplanned outages.*
- *Why was EUCPI discontinued? EUCPI was discontinued because, according to Stats Canada, the methodology that was being used needs to be verified. It is currently under review and it may or may not return.*
- *The OEB is asking utilities to use the Pacific Economics Group (PEG) model in their forecasts. Is that in this scope? This study just looks at the TFP trends, it does not do any total cost benchmarking for Hydro One. This study only looks at how Hydro One's TFP has changed over time.*
- *As stated, between 2002 and 2015, the average annual TFP trend declined by 0.9%. What would this do to the Board's current X-Factor? It should lower the X-Factor.*
- *During the presentation, it was noted that Hydro One spends 6% on safety. What is this percentage in reference to? It is 6% of the total cost of Hydro One*
- *If you are spending this money on safety, is the result included in the output index? Injury data is incorporated into the output index with predetermined weights. It is represented by the change in injuries per 200,000 hours worked.*
- *Why is safety an output? It seems to be a common element of running a business? Output may not be the best word – performance measure or metric is better. It is not a profit function to make a safety a priority because it is the right thing to do, so it can be thought of a society output. Customers don't experience this output, but if it were to be excluded as part of the cost function, it would be giving an advantage to utilities that are not focusing on safety.*
- *About 75% of outages are caused because of factors that are out of the control of utilities, e.g. weather and human contact. Could you measure outages that are caused mainly by failure of equipment? Within that 75%, there are some factors that are tied back to how the utility performs in regards to tasks such as tree trimming. Having said that, one main reason why major event days were removed was because the statistics skewed the numbers, and we also focus on a three-year rolling average, which gives a better indication of the impacts on customers.*
- *Conceptually, could you adjust the SAIDI and CAIDI by a factor due to weather? Yes, it is possible. There have been wind variables used in the past. Toronto Hydro makes a case for reliability benchmarking.*
- *Could you take the Ontario industry and measure it over a 10 year wage rate for a utility vs. a wage rate for the province as a whole to understand the impact? The industry will have its own provision of required employees and there will be a different composition in that industry, so it is hard to compare*
- *If you were to take Hydro One's forecasted costs, could you determine the TFP for the next five years? Yes, but assumptions would need to be made on pricing changes.*
- *Are the costs associated with reliability increasing over time? This is one possible explanation, but it could be the opposite. A utility could be getting worse on its reliability because it is cutting costs. At some point, reliability is likely to worsen. So we should include the worsening of reliability into the TFP as well.*
- *Does spending money on safety and reliability lead to better performance for Hydro One? Typically, more money is spent to improve an outcome. For Hydro One, the reliability factor adjustment really is not improving things, reliability has stayed flat. It is difficult to determine what the exact costs of reliability are.*
- *Was using an overall construction index considered to compare Hydro One capital spending to other industries? No.*

- Are the numbers consistent with the 4GIR up to 2012? *Yes.*
- Will the HWI figures for 2016 be updated for the upcoming application filing? *It is unlikely because the 2016 data will probably not be available.*
- Are the Canadian indexes and the Handy-Whitman index moving in the same direction? *Yes, they are both increasing over time.*
- Is the Handy-Whitman index the only one that could be used? *It seems to be. This is the only index that is utility specific and looks at capital assets – there is not currently a Canadian equivalent, but if there was, it would be used. The current index being used is the best available.*
- Was there any other data that was adjusted other than what was mentioned? *A minor change was made to a Hydro One value for peak demand in 2013 because it looked inconsistent.*

Presentation #2 – Vegetation Management Program Study

William Porter from CN Utility Consultants presented the Preliminary Findings and Recommendations of the Vegetation Management study. Following William's presentation participants asked questions of clarification and provided feedback. A summary of the questions and feedback is provided below.

Please note that responses provided to questions and comments are noted in *italics* immediately following each question or comment.

Questions of Clarification

- What does the term “managed kilometer” mean? *This is a kilometer that was managed by vegetation management staff per year.*
- The techniques surrounding vegetation management have not changed. Why is the number of labor hours going up per tree? *Recent events, such as fires can affect how many labor hours are used. This creates a more strategic and targeted approach towards vegetation that often requires more time. This is also dependant on cycle lengths.*
- Hydro One has much higher costs per kilometer. Is this because Hydro One staff is being paid more? *There is an increase of overall cost on an hourly basis, but the labor burden, equipment costs, and administrative costs can drive up the cost per kilometer.*
- Is it recommended that Hydro One employees conduct the work instead of contractors? *Usually, yes. The full time employee system has led to low turnover and better safety. Substitution of low cost contractors can hurt these outcomes.*
- What does “Establish flexible variable cycles of inspection and maintenance to achieve objectives” mean? *It means establishing flexibility to be more strategic to look at areas of the company and determine whether or not there needs to be a more dynamic approach instead of a standardized cycling approach.*
- What “additional metrics” are being referred to? *This refers to an area of metrics that are able to define the objectives that are harder to quantify and measure such as, safety, environmental stewardship and customer service.*
- During an outage, would a vegetation management employee be sent in? *Hydro One has an outage investigation that is performed by a non-vegetation management employee based on a very limited number of data entries.*
- Would a metric that correlated vegetation-caused outage and vegetation management visits make sense? *Yes.*
- Should there be a metric to test the effectiveness of vegetation management procedures? *No answer provided, as the questioner moved on to another question before allowing William to answer*
- “Labor hours per tree treated” is a term used. How is this number determined? *Companies are asked to report how many trees they have treated.*
- In regards to cost per tree treated, how has Hydro One only increased costs by 3% while the rest of the industry has shown an increase of 97%? *Hydro One still has the highest cost per managed kilometer of all the peers. This is done by managing ingrowth effectively and how long the cycle length is.*
- Regarding cycle length, are regional differences taken into account? *Yes, but these are not planned cycle lengths. The m class is on target to be managed at 6.5 years. Much of the system is in a backlog. A minimum of 8 years would be more appropriate.*

- If you change the cycle length, what does it do to the cost? *It is hard to determine this exactly. If you look at example X9 on the productivity slide, lower cycle length does not necessarily mean lower costs. To get feeders to 6.5 years will take six years.*
- In regards to the peer group, how many are Canadian? How many are in Ontario? *There are five Canadian utilities in the peer group. There are none from Ontario.*
- Is data available to determine if contractors are more efficient than Hydro One in regards to their labor metric? *All of the peers except for one are contractors. When looking at labor statistics per tree and per kilometer, Hydro One seems to be more productive than the peers. There is no data for in-house management. Hydro One is an outlier.*
- Regarding outsourcing, are the prices fixed or is it based on an hourly cost? *The largest component is time and material, but the unit price has substantially grown over the last 5-10 years. Due to this, it is mostly based on a unit price cost because lump sums can lead to inaccuracies because of the number of variables present.*
- Is there ability to monitor branches and hit lines? *Theoretically, it is possible.*
- Could you data mine trends for outages? *Don't know if it is possible, but the science is there and it is improving, but setting up a reactive system might create an increased cost.*
- How is tree density determined? *It is the total number of trees managed.*
- Is it possible to clearly identify what data is needed from distributors in Ontario for them to be used as part of the peer group? *The cost of managing a tree in a town and in rural areas is different. If the Ontario distributors are primary suburban/urban distributors, their data will look much different than Hydro One's.*
- Is the ratio of management staff measured between Hydro One and the peer group? *There are comparative labor rates that are compared. The charge out rate, labor burden, and wage are all compared, but there is no conclusive data for quantity of staff.*
- Two of the goals listed were maintaining 100% clearance of ROW (Right of Way) and achieving ROW conversion over time. Is information available about the percentage of ROW converted for the peer group or the amount of ROW they targeted or achieved? *The peer group was not asked this question.*

Presentation #3 – Pole Replacement and Distribution Station Refurbishment Program Studies

Ben Grunfeld from Navigant and Ken Buckstaff from First Quartile presented the Preliminary Findings and Recommendations of the Pole Replacement Program and the Distribution Station Refurbishment Program Studies. Following their presentation, participants asked questions of clarification and provided feedback on the study. A summary of the questions and feedback is provided below.

Please note that responses provided to questions and comments are noted in *italics* immediately following each question or comment.

Questions of Clarification

- How was currency adjusted? *All currency was converted to Canadian Dollars.*
- Why was it converted to Canadian dollars when operations and purchasing is done in Canada? *This is done to directly compare Hydro One to American companies.*
- Does it make sense to weigh the currency change based on the influence it actually has? *If the exchange rate keeps moving, yes, but for the majority of the comparisons in this study, a majority of the data predates 2014, so it does not have a major impact on this study.*
- How does Hydro One conduct physical inspections? *Hydro One only does limited physical testing.*
- When estimating life time costs, did you adjust the cycles? *No, they are actual inspection cycles used.*
- It would be nice to know the breakdown and cost of equipment in regards to tree maintenance.
- In cost per pole 'touched', what does 'touched' mean? *Inspected, replaced, or refurbished this year. This includes visual inspections.*
- There is a recommendation for a vigorous refurbishment program. Would this be more cost effective? *The recommendation is for Hydro One to consider introducing a vigorous refurbishment program. The cost effectiveness depends on a number of factors. If a pole is too old, then replacement makes sense, but for newer poles that are failing prematurely, there could be a case for refurbishment instead. Other utilities do have a refurbishment program. This is only applicable to a small percentage of poles.*
- Who determines the useful life of poles? *The utilities.*
- So many Hydro One poles are at end of life or past useful life. How important is the useful life statistic? *The useful life may not be reflective of the actual life of the poles.*
- Is it valid to examine looping and redundancies knowing that it will be cost effective? *This would not be effective across the board, but it would work in some instances. However, there are no written recommendations regarding this.*
- Is there specific data for each of the peer group members, such as how many poles each peer touched, and does this have any impact on the cost of poles touched? *This data is present, but as a percentage of their system, the cost is similar.*
- Did you draw any conclusions regarding trend and unit cost between 2012 and 2014? *There is a slight increase, but not for all criteria. Inflation was not measured, but it was not dramatically out of line when compared to the peer group.*
- Did you assess quantity of assets replaced? *The information is present, but this was assessed across the comparison group.*

- Did you assess the condition of assets? *No*.
- Did you find that as companies increase the amount of poles they were replacing, that they became more efficient? Did they decrease costs through economies of scale?
There are generally economies of scale with this type of activity; however, across the comparison panel we did not perceive clear evidence of incremental economies of scale.
- How were replacement costs calculated? *Total dollars/total poles*.

Notable Themes and Discussion Points

Following the end of the final presentation, Dave Hardy noted the main themes and discussion points that arose during the presentation.

Total Factor Productivity

- Safety was a theme noted as a measure of TFP
 - Safety index; whether or not safety should be an output
- Whether TFP includes an appropriate value for reliability
- Whether there is scope for more detailed correlation of factors and effects to measure TFP
- Weight given to outages caused by weather and major events

Vegetation Management

- Exploring administration and overhead costs
- Additional metrics – safety, environment quality, customer service
- Cycle length and relation to cost and performance
- What data should and should not be part of the peer group comparisons
- When Hydro One should or should not be compared to the peer group

Pole replacement

- Data gathering and ROW maintenance
- Definition of useful life vs. actual life

Distribution Station

- Looping and redundancy
- Economies of scale

Final Comments

Following the final presentation and recap of notable themes, Dave Hardy provided time for each participant to note additional comments and questions they had regarding any of the sessions. The following comments and questions were noted.

TFP

- Have another other outputs been tested other than safety and reliability? If so, what were the results? *Unanswered during session.*

Vegetation Management

- Weather impact should have been considered more because Hydro One has some volatile regions. Vegetation Management cycle might need to be altered for areas with more volatile weather.
- Was the CN study adjusted for currency? *Yes.*

Pole Replacement Study

- Clarify terminology (i.e. “touched”)

Miscellaneous

- When is Hydro One planning on filing the application? *At the end of the first quarter of 2017.*
- Who can further questions be directed to? *The worksheets will be sent out electronically following the meeting. Please submit any additional questions on the worksheet by October 12th.*

Wrap Up – Maxine Cooper, Hydro One

Maxine Cooper thanked participants for their feedback and encouraged them to share additional input and feedback via email/the soft copy of the worksheet. She also encouraged participants to be in touch at any point between this session and the next if they have any topics they want to discuss. Maxine noted that participants will have until October 12th, 2016 for written feedback.

PARTICIPANT LIST

The following is a list of participants that attended the meeting and the organizations they represent.

Stakeholders & Consultants

- Bayu Kidane, *Power Workers Union*
- Benjamin Grunfeld, *Navigant Consulting (Presenter)*
- Bohdan Dumka, *The Society of Energy Professionals*
- Brady Yauch, *Energy Probe Research Foundation*
- Chris Codd, *Ontario Energy Board*
- David MacIntosh, *Energy Probe Research Foundation*
- Dmitry Balashov, *Toronto Hydro-Electric System Limited*
- Harold Thiessen, *Ontario Energy Board*
- Ian Nokes, *Ontario Federation of Agriculture*
- Jane Scott, *Ontario Energy Board*
- Jie Han, *Canadian Niagara Power*
- Ken Buckstaff, *1st Quartile (Presenter)*
- Mark Garner, *Vulnerable Energy Consumer Coalition*
- Mark Rubenstein, *School Energy Coalition*
- Mike Jessop, *Ontario Power Generation*
- Rob Earle, *1st Quartile*
- Shelley Grice, *Association of Major Power Consumers in Ontario*
- Steve Fenrick, *Power System Engineering (Presenter)*
- William Porter, *CN Utility (Presenter)*

Hydro One Networks Inc.

- Erin Henderson, *Hydro One Networks Inc.*
- Maxine Cooper, *Hydro One Networks Inc.*
- Oded Hubert, *Hydro One Networks Inc.*
- Paul Brown, *Hydro One Networks Inc.*
- Jody McEachran, *Hydro One Networks Inc.*
- Karen Taylor, *Hydro One Networks Inc.*

Hardy Stevenson and Associates Limited

- Dave Hardy, *Facilitator*
- Jeremiah Pariag, *Note taker*