



Vegetation Management Benchmarking and Density/Cost Allocation Studies

Stakeholder Consultation Meeting Notes

Metropolitan Hotel
Victoria Room, Second Floor
108 Chestnut Street, Toronto

April 15, 2009



Prepared for:
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Table of Contents

1. BACKGROUND	1
1.1 Welcome and Introductions	1
1.2 Process Overview	1
2. PRESENTATIONS AND DISCUSSION	2
2.1 Background on Vegetation and Density Studies.....	2
2.2 Hydro One Forestry Program & Overview of Vegetation Management Benchmarking	3
2.3 Vegetation Management Facilitated Discussion.....	5
2.4 Overview of Density/Cost Allocation Study.....	7
2.5 Density/Cost Allocation Facilitated Discussion.....	8
3. CLOSING REMARKS/NEXT STEPS.....	9

Appendices:

1. Agenda and Participant List
2. Presentations and Facilitated Discussion Questions and Answers

1. BACKGROUND

Hydro One Networks Inc. is in the process of preparing its 2010/11 Distribution Rate Application for submission to the Ontario Energy Board (OEB) during the summer of 2009 for rates effective in the first quarter of 2010.

The OEB's 2008 Distribution Decision directed Hydro One to provide in its next application:

- Definitive information on its relative efficiency in vegetation management, in consultation with intervenors and OEB staff; and,
- A detailed analysis on the relationship between density and cost allocation.

Hydro One invited key stakeholders who intervened in Hydro One Networks' 2008 Distribution rates proceeding to participate in a discussion session to share its current thinking and approach to these two areas of study and to solicit stakeholder perspectives, ideas and concerns.

This document reports on the discussion session that took place on April 15, 2009.

1.1 Welcome and Introductions

Allan Cowan (Director, Major Applications, Hydro One Networks) welcomed participants, thanked them for their attendance and encouraged them to raise their concerns and questions and to present new ideas, noting the importance of their input in shaping how Hydro One will address the OEB's directives regarding vegetation management and density. He then introduced Chris Haussmann of Haussmann Consulting Inc. (HCI) as facilitator for the workshop. Chris asked participants to introduce themselves.

In attendance were representatives from the Association of Major Power Consumers of Ontario, Energy Probe, Federation of Ontario Cottagers' Associations, the Ontario Energy Board, Power Workers Union, Rogers Cable Communications Inc., School Energy Coalition, Toronto Hydro, and the Vulnerable Energy Consumers Coalition. Also present were Hydro One staff and the HCI facilitation team.

The full list of participants, together with the agenda, is provided in Attachment #1.

1.2 Process Overview

Chris reviewed the proposed agenda, which was structured to provide participants with information about Hydro One's current approach to vegetation management /benchmarking, as well density/cost allocation. The agenda also provided stakeholders an opportunity to participate in two facilitated discussions to consider how Hydro One should address the OEB's 2008 directives to carry out a vegetation management benchmarking study and a detailed density/cost allocation study. The facilitated discussions focused on the following questions that stakeholders received prior to the meeting as a starting point for dialogue.

Vegetation Management Benchmarking

1. Definition of Efficiency
 - How should efficiency be defined for Vegetation Management Programs?
 - What measures should be used to benchmark efficiency?
 - How much emphasis should be placed on qualitative aspects such as practices and management approaches?
2. Comparability Criteria
 - What attributes should a utility possess to be deemed comparable to Hydro One for the purposes of benchmarking?
3. Confidentiality
 - Could the study findings and results remain confidential to increase the likelihood of utility participation?

Density/Cost Allocation Study:

1. Should “customer density” be a consideration in defining customer classes?
2. What criteria are relevant for defining customer classes?
3. How should “density” be considered in allocating costs to the various classes?

The objectives for the meeting were therefore to seek input from stakeholders and Board staff to assist Hydro One in defining the terms of reference for the vegetation management benchmarking study, and the approach to the density study.

2. PRESENTATIONS AND DISCUSSION

The following sections provide brief descriptions of the presentations made by Hydro One staff. Questions of clarification and discussion following each presentation are summarized.

Appendix B presents a more detailed paraphrase of the actual questions and answers heard during the discussions. All meeting presentation slides are available on the Hydro One distribution rate application Web site at: <http://www.hydroonenetworks.com/en/regulatory/>

2.1 Background on Vegetation and Density Studies

Henry Andre (Manager, Major Applications) provided a brief overview of the OEB’s 2008 Distribution Decision directives to Hydro One regarding vegetation management and density considerations. He reiterated that the OEB wanted Hydro One, in consultation with intervenors and Board staff, to include in its next application a benchmarking approach to provide definitive information on the comparisons of its vegetation management efficiency with other utilities. In addition, the OEB also directed Hydro One to carry out and provide further and detailed analysis of the relationship between density and cost allocation, including customer class demarcations and alternative density weightings used in the cost allocation model. Although the OEB did not specifically request stakeholder consultation regarding density considerations, Henry noted that Hydro

One wished to get intervenor input on this issue as well, and that this would be beneficial in assisting Hydro One in shaping the evidence for its upcoming Distribution Rate Application.

Henry also reviewed Hydro One's proposed 2010/11 Distribution Application timeline, noting that stakeholder consultation sessions were being considered for May and June 2009, that Hydro One hoped to file the application by mid July, and would be asking that the new rates for 2010 take effect on January 1.

In conclusion, Henry asked participants for a productive discussion that will assist in defining the scope and terms of reference for the vegetation management benchmarking exercise and guidance as to how the density study should be approached.

Questions of Clarification

Hydro One confirmed that it is advancing its application filing date and moving to a January 1 rate implementation date at the request of the OEB. This is expected to assist other local distribution companies (LDCs) that rely upon Hydro One low-voltage and sub-transmission rates to develop their own rate applications. Concern was expressed that the vegetation benchmarking and density/cost allocation studies could not be ready in time for a July filing date. Hydro One expressed confidence that it could have the vegetation benchmarking study available either for the July filing or as an update before the hearing, and that depending on the input received today on density and cost allocation some evidence could be incorporated into its application. Toronto Hydro reported that it is also moving to a January 1 rate implementation date in its applications.

It was also noted that the *Green Energy and Green Economy Act* will have a significant impact on Hydro One. Hydro One reported that it has been advised to be ready for a June 2009 royal assent of the legislation. One of the key issues arising from this legislation is how the costs of distributed renewable generation mandated by this Bill will be recovered. Hydro One prefers that the costs be recovered either directly from the generators, or from all Ontarians, as green energy will benefit all citizens of the province.

Hydro One will be providing additional information on the implications of the *Green Energy and Green Economy Act* and the coming implementation of the *International Financial Reporting Standards* at the stakeholder sessions planned for May and June 2009.

2.2 Hydro One Forestry Program & Overview of Vegetation Management Benchmarking

Jack Coulis (Director, Forestry Services) provided a comprehensive overview of Hydro One's current vegetation management practices to ensure reliability of service for its 1.2 million distribution customers across a vast and geographically varied service territory the size of Texas and California combined. He explained that differing weather, terrain, vegetation characteristics, customer preferences and access challenges in Hydro One's northern, central and southern Ontario service territories determine what type of vegetation management techniques, work practices, equipment and human resources are required to cope with 100,000 km of vegetation exposure (overhead distribution lines). He described line and brush clearing challenges and practices in the different service areas and noted that approximately 70% of Hydro One's overhead distribution lines are "on road" (i.e. with

access from roadways), with 30% “off road”. Safety is a key priority for Hydro One’s forestry workforce, which utilizes up to 1,200 people during the peak summer period (of which 600 may be provided through a hiring hall) and boasts 4.7 million work hours without a lost time injury. This workforce includes arborists (line clearing), labourers (brush clearing) technicians (job planning and customer notification) and territory managers and superintendents. Contracting may also be used to supplement the work force when necessary.

Questions of Clarification

The following clarifications were provided in response to questions during and following the presentation:

- Vegetation is managed to protect against both falling trees and wind or snow induced line contact;
- Joint users of Hydro One poles such as telephone or cable companies do pay an amount for Hydro One vegetation management services – they rely on Hydro One to keep lines clear;
- The Ministry of the Environment worked with Hydro One when they developed the herbicide restrictions policy (Cosmetic Pesticides Ban Act, 2008). The low-volume, targeted stem application process and reporting protocols fit within these restrictions. Hydro One has vegetation management agreements with all municipalities in Ontario except one, and a specific training and certification program for its field staff.

Following Jack’s presentation, George Juhn (Director, Sustainment Investment Planning) provided an overview of the system impact of vegetation, the costs associated with Hydro One’s vegetation management programs, and some of the key program drivers and planning considerations. He noted that between 2004 and 2007, “trees” contributed 52% to the total System Average Interruption Duration Index (SAIDI), suggesting that reliability is a key driver for vegetation management. He provided historical cost details for the ten year cycle vegetation management programs (2004-2006) and the increased costs for the eight year cycle that resulted from the last rate case. The total costs for the latter were \$115 million (bridge year 2007) and \$119.4 million (2008 test year), versus \$89.1 million in 2006 (Slide 12).

George then discussed the PA Consulting Group’s benchmarking study submitted as part of the last filing. This study provided data such as costs and reliability from 13 “peer” utilities in North America for 2006. However, tree trimming comparisons based on one year of data (cost per km trimmed, cycle times) were available from only two to six comparable distribution utilities. He noted that 2006 was a year of numerous major storms in Ontario, effectively putting Hydro One on an 11 year cycle, but that Hydro One’s data in the study was not normalized to take this into account.

George also provided an overview of the 2008 Program Review and the data resulting from Hydro One’s participation in the Tree Line Connection benchmarking study (CN Utility). The 2008 Program Review compared Hydro One to a number of comparable North American distribution utilities with respect to vegetation management cycle lengths, costs per km and reliability as measured by tree-caused System Average Interruption Frequency Index (SAIFI) by cycle length. George pointed out that it is very difficult to get utilities to participate in benchmarking studies, even when they are assured of confidentiality.

The 2010/2011 vegetation management program is awaiting Hydro One Board approval and has not yet been finalized.

Questions of Clarification

It was noted that, while Hydro One is working towards an eight-year average vegetation management cycle this does not mean that each line would be trimmed in the same sequence every eight years. Priorities are set based on asset condition assessment and customer needs. As a minimum, Hydro One vegetation management practices meet the requirements of the Distribution System Code. California has a more stringent code with zero tolerance of line contact, but to implement that in Ontario would require substantially more funding. Hydro One can only trim within its rights-of-way. Moving to the eight-year cycle will reduce further the frequency of vegetation contact with lines. Higher voltage (three-phase) lines receive the highest priority attention.

In its last filing, Hydro One included some data on the relationship between cycle length and cost experienced by other utilities. Hydro One will be undertaking such a study for its own lines in the future. Moving from a 10+ year cycle to an eight-year cycle, Hydro One expects costs to be reduced over the cycle period.

Obtaining good benchmarking data is very challenging. It is difficult to draw meaningful conclusions from data based on a limited number of participating utilities as in the case of the PA Consulting benchmarking study. Frequently, other utilities do not have the staff or resources to compile the data, or they have no interest in developing such data, so they do not participate in the studies. Also, the data are not always of good quality or even comparable. For example, travel time to reach lines being serviced could vary significantly among utilities, but this may not be accounted for in the data. Even if comparable companies are assured the data will be held confidential, this does not always guarantee their participation.

2.3 Vegetation Management Facilitated Discussion

Following the presentation, Chris Haussmann facilitated the discussion session on vegetation management benchmarking. The following summarizes the questions and discussion that took place.

Question 1: Definition of Efficiency

- **How should efficiency be defined for Vegetation Management Programs?**
- **What measures should be used to benchmark efficiency?**
- **How much emphasis should be placed on qualitative aspects such as practices and management approaches?**

There was considerable discussion around the challenge of collecting “definitive information” sufficient for purposes of benchmarking. It was noted that vegetation management comprises a significant component of the revenue requirement (\$120 million or 12%), and therefore should be supported by a sufficient level of detail. Participation rates in benchmarking studies are typically low, thereby compromising the data quality and raising doubts about any benchmarking study providing “definitive” results. Some stakeholders felt the level of detail provided in the CN Utility study was sufficient. It was noted that the Federal Energy Regulatory Commission (FERC) collects a lot of data, some of which may be relevant and useful.

It was suggested that statistical benchmarking (whereby weightings are developed to adjust for under or over representation of certain data within the data sets collected) is an approach the OEB has considered that could overcome some of the challenges of finding good comparator utilities for benchmarking purposes. However, this does not entirely address the issue of benchmark quality where data inputs are limited or suspect.

It was noted that the term “efficiency” should not refer solely to cost. Cost efficiency (\$/km) is related to a company’s measures for reliability. So “reliability” should be an important benchmarking metric, as well as cost. It was suggested that cost should be related to unit of output such as SAIDI or safety, i.e. what it costs to achieve an additional unit of reliability or safety. While there are numerous measures of worker safety, some felt that this metric would be unlikely to differentiate between distribution companies, as the safety record is generally very good for all. Other variables mentioned as likely candidates for benchmarking metrics are “on-road vs. off-road line lengths”, cycle length, % rural vs. % urban and “total area of territory serviced”. And it was suggested that the measure of “total cost/total km/cycle” may be a broader measure of efficiency as opposed to cost/km/year. Another more gross level metric could be “vegetation management expenditure as a percentage of total OM&A costs” to provide an overview comparison with other utilities.

Some suggested that customer satisfaction may be a useful metric, but it was noted that customer satisfaction surveys do not correlate well with vegetation management, and while honouring customer property rights and preferences on private property, Hydro One does not operate its vegetation management program to satisfy customer preferences. The primary objective is to ensure reliable service. However, such qualitative management practices may be helpful to explain any quantitative differences in benchmarking outcomes.

The hope was expressed that one of the outcomes of benchmarking would be to identify where the best return on OM&A investment can be achieved, e.g. whether to spend more on vegetation management or poles, or whether to adjust cycle lengths in various types of terrain.

Hydro One was encouraged to highlight in its upcoming filing any “innovations that improve productivity and efficiency” that have been undertaken in its vegetation management program since the last filing.

Question 2: Comparability Criteria

- **What attributes should a utility possess to be deemed comparable to Hydro One for the purposes of benchmarking?**

Some likely candidates for comparability with Hydro One were identified. In Canada, New Brunswick, Quebec and British Columbia have similar terrain and vegetation to manage, which were suggested as a consideration in selecting comparables. In the United States, Maine, Michigan, Wisconsin, Washington and Oregon are likely comparables. It was noted that the comparability criteria must be explicitly identified, and the metrics selected must be defined in a similar manner by each utility. For example, the costs attributed to vegetation management may include planning and customer notification in some cases, but not in others.

The following criteria were suggested:

- Percentage of lines requiring vegetation management
- Type of terrain comprising the territory
- Rural/urban density split, e.g. customers/km line or MW load/km line (the relevance of this to vegetation management was questioned)
- Km on-road/off-road split
- Overhead vs. underground line split

And it was noted that to overcome the considerable variations in vegetation management costs occasioned by weather fluctuations, several years' average data should be compared.

Several stakeholders proposed that Hydro One territory be divided into distinct regions based on vegetation type, climate and population density. It may be easier to find comparables for each of the various regions rather than trying to find comparables for the entire utility.

A participant suggested that one reason for the OEB directive is a suspicion that Hydro One is not very efficient in its use of labour and overhead, and suggested comparing a breakout of these costs for vegetation management. Another suggested providing more internal benchmarking to demonstrate improvements in the program's efficiency over time.

Finally, it was suggested that a considerable degree of detail could be found in the various utilities' regulatory filings, and that statistical benchmarking could help to deal with some of the variations in utility characteristics among the comparables selected.

Question 3: Confidentiality

- **Could the study findings and results remain confidential to increase the likelihood of utility participation?**

Participants generally felt the confidentiality issue could be dealt with by using anonymous identifiers for comparable utilities in any benchmarking reports. This has been shown in the CN Utility and PA reports. The greater concern is getting a sufficient level of participation in studies to obtain the required data and allow meaningful conclusions to be drawn. It was suggested that Hydro One could directly approach appropriate utilities with which it has a good working relationship to solicit participation in a benchmarking study.

One participant suggested that comparing total vegetation management expenses to total OM&A costs using data readily available from regulatory filings may be a good starting place that would not be hampered by confidentiality issues.

2.4 Overview of Density/Cost Allocation Study

Michael Roger (Manager, Distribution Pricing) provided an overview of the Density/Cost Allocation Study. He reviewed the OEB's Directive with respect to the study, which asked for: a detailed analysis on the relationship between density and cost allocation; an analysis of whether customer class demarcations best reflect cost causation; and, consideration of alternative density weightings. Mike

reviewed current density definitions for urban, medium and low density zones and explained how density weighting factors (Customer and Demand density) are used to allocate overhead line and transformer related fixed and variable costs to various customer classes (Urban, R1 and R2). Overhead lines and transformers are the largest cost items in distribution. He also noted other important current rate issues: Hydro One will still be implementing its four year Harmonization Plan in 2010; rates continue to be under pressure due to Smart Network implementation and continued expansion of Distributed Generation; and, the OEB Staff Paper on proposed Rate Design.

Questions of Clarification

A number of questions were raised during the presentation. The following clarifications were provided:

- The density-based categories apply to Residential customers. The General Service Urban class is based on the same definition of “urban” as the Urban Residential class, but the rest of the General Service customers are combined in one class, not two.
- In developing the density-based customer weighting factor, which allocates fixed costs to the rate classes, it is assumed that each customer in a rate class uses the same length of feeder line and incurs the same transformer cost as every other customer in the same class. Similarly, demand density weighting factors, which allocate variable costs to rate classes, are based on the assumption that every customer in a class makes the same average energy demand on the system as every other customer in that class.
- **General Service is treated as two separate groups in developing the Density Weights: one group for General Service energy billed, (small General Service urban and non-urban) and one group for General Service demand billed, (large General Service urban and non-urban).** *(This is a correction of a statement made at the meeting by Mr. Roger.)*

2.5 Density/Cost Allocation Facilitated Discussion

Following the presentation, Chris Haussmann facilitated the discussion session on the density/cost allocation study. Three questions were provided to stakeholders for consideration before the meeting.

1. Should “customer density” be a consideration in defining customer classes?
2. What criteria are relevant for defining customer classes?
3. How should “density” be considered in allocating costs to the various classes?

However, while the discussion eventually touched on these questions, it was more wide-ranging and is summarized here as one discussion.

During the presentation, there was a great deal of discussion around the weighting factors applied in the cost allocation methodology. It was accepted that the calculation was correctly applied to allocate an equal share of fixed and variable costs to customers in each class, with the result that customers in more densely populated areas pay less per customer, because there is less

line length required to service them than customers in more sparsely populated areas. However, it was questioned whether the weighting methodology properly reflects the system architecture and actual costs incurred by Hydro One to provide service to customers. For example, it was proposed that acquired utilities already have a local system that does not require as much feeder line as the weighting assumes. Hydro One would have to conduct further investigation to determine precisely how each community is served. Overall, only 11 of the 88 acquired utilities and 156,000 of 879,000 Hydro One residential customers qualify as “urban” according to the definition “minimum of 3000 customers and 60 customers per km of line”.

Another concern expressed was that “street lights” in an urban area, with a weighting of “1”, pay a higher proportionate cost than do “urban residential” customers. And “sentinel lights” pay a lower proportionate cost than “rural residential” customers. This is counter-intuitive.

It was suggested that the “Seasonal” customer class should not be given a density weighting because it is no longer a density-based class. If this is done, the other classes will have to make up the difference since the cost allocation is a zero-sum exercise.

It was also noted that the density weighting methodology could be applied to any class of customers, e.g. sentinel lights or street lights, and that the class definition need not be based on density per se.

Following the presentation, it was noted that Hydro One was in somewhat of a quandary about whether to proceed with a review of the density/cost allocation methodology, given that OEB staff had recently issued a paper proposing that density should NOT be a factor in cost allocation. It was suggested that completing the review of how density affects cost would be helpful and could inform the discussion around the OEB staff paper. After extensive discussion, it was concluded that Hydro One should proceed with a study to identify the underlying principles that relate density to cost, and the factors that need to be considered in determining those costs.

Hydro One offered to bring to the next stakeholder session suggested principles and factors. If agreement can be reached on those parameters, then the next step would be to collect the available data and estimate the actual cost of those factors. With the exception of the SEC representative, stakeholders agreed with this staged approach. Hydro One indicated that it would advise the OEB in writing that it had settled on this approach following discussion with stakeholders, and would copy stakeholders on the letter.¹

3. CLOSING REMARKS/NEXT STEPS

Allan Cowan thanked stakeholders for their participation and input, noting that the next stakeholder meeting would likely take place in late May. He adjourned the meeting at 3 pm.

¹ On April 20, 2009 Susan Frank sent a letter to the OEB with copies to attending stakeholders advising of the approach Hydro One would take to the study of the relationship between density and cost allocation.

**APPENDIX 1
LIST OF PARTICIPANTS**

Agenda
April 15, 2009
Toronto Metropolitan Hotel
108 Chestnut Street, Toronto
Victoria Room

8:30 a.m. Registration and Continental Breakfast served		
9:00 a.m.	Welcome	Allan Cowan, Director Major Applications, Hydro One Networks
9:05 a.m.	Introductions and Agenda	Chris Haussmann, Facilitator, Haussmann Consulting Inc.
9:10 a.m.	Background on Vegetation Benchmarking and Density Studies	Henry Andre, Manager Major Applications, Hydro One Networks
9:30 a.m.	Hydro One Forestry Program & Overview of Vegetation Management Benchmarking	Jack Coulis, Director Forestry Services, Hydro One Networks & George Juhn, Director Sustainment Investment Planning, Hydro One Networks
10:15 a.m.	BREAK	
10:30 a.m.	Vegetation Management Facilitated Discussion	Chris Haussmann, Facilitator, Haussmann Consulting Inc.
12:00 p.m.	LUNCH	
1:00 p.m.	Overview of Density/Cost Allocation Study	Michael Roger, Manager Distribution Pricing, Hydro One Networks
1:30 p.m.	Density/Cost Allocation Study Facilitated Discussion	Chris Haussmann, Facilitator, Haussmann Consulting Inc.
2:30 p.m.	Closing Remarks/Next Steps	Allan Cowan, Director Major Applications, Hydro One Networks
2:45 p.m.	Adjourn	

LIST OF PARTICIPANTS

Name	Affiliation
Armstrong, John	Rogers Cable
Clark, Wayne	Association of Major Power Consumers of Ontario (AMPCO)
Faye, Peter	Energy Probe
Harper, Bill	Vulnerable Energy Consumers Coalition (VECC)
Kwik, Judy	Power Worker's Union (PWU)
MacIntosh, David	Energy Probe
McGee, John	Federation of Ontario Cottagers Association (FOCA)
McLorg, Colin	Toronto Hydro
Shepherd, Jay	School Energy Coalition
Thiessen, Harold (morning only)	Ontario Energy Board (OEB)
Andre, Henry	Hydro One
Bowen, Amy	Hydro One
Cancilla, Enza	Hydro One
Cowan, Allan	Hydro One
Frank, Susan	Hydro One
Hann, Norman	Hydro One
Juhn, George	Hydro One
Lyberogiannis, Elias	Hydro One
Roger, Michael	Hydro One
Hausmann, Chris	Hausmann Consulting (Facilitator)
Mueller, Peter	Hausmann Consulting

APPENDIX 2

PRESENTATION AND FACILITATED DISCUSSION QUESTIONS AND ANSWERS

Background on Vegetation and Density Studies Presentation

Points in *italics* represent responses or comments from Hydro One.

Questions of Clarification following Henry Andre's presentation:

- Isn't a January 1st rate implementation date a change from the current practice, which has in the past been May 1st? Such a change would contradict OEB policy.

We want to move to a January time frame. This will help other LDCs to put their rates in place for May since some of the inputs that go into their rates come from Hydro One rates (i.e., sub-transmission (ST) and retail transmission rates (RTSR)). The OEB has asked us to see if we can advance both our application filing and the rate implementation dates.

In addition, the Green Energy and Green Economy Act and the International Financial Reporting System (IFRS) of accounting, which comes into effect in 2011, are driving new requirements and Hydro One's next filing will reflect this. We will discuss these issues and seek your input at the May and June stakeholder sessions.

- Toronto Hydro is moving in the same direction in order to synchronize rate and fiscal periods.
- Bill 150 (*Green Energy and Green Economy Act*) will have a huge impact on Hydro One. Do you know when it will receive royal assent? If green energy is going to be subsidized, it should be by all the people of the province.

It has been suggested that we should be ready for June. One of biggest uncertainties is the cost recovery issue for renewable generation connections. Who pays – the generators (the current practice), all the people of Ontario or our customers? Hydro One's preference is either the generators or all Ontarians, since the entire population will benefit from renewable energy.

- If an application is to be submitted to the OEB in July, how will you have time to do these studies for 2010? Is it your plan to do them later?

We will respond to the input we get today fairly quickly. If we can get the vegetation benchmarking study done before July, we will include the results in the pre- filed evidence. If the results are not available by July, we will submit these as an update. As for the density issue, we really are looking for your input and guidance today to help us determine our approach. We believe we can address both the vegetation and density OEB directives as part of this filing.

Hydro One Forestry Program & Overview of Vegetation Management Benchmarking Presentation

Points in *italics* represent responses or comments from Hydro One.

Questions of Clarification Following Jack Coulis' Presentation:

- Your concern is to remove trees that may fall over and short out lines. Are you also concerned about momentary contacts of lines by trees as a result of winds?

That is correct. We try and shape (clear back) our corridor at each cycle to prevent both falling trees from contacting lines as well as reducing the likelihood of contact as a result of wind during that cycle.

- You have a lot of joint use lines that may have cable TV and Bell Canada on them. Do they pay anything to your line clearing programs or is that included in the rentals of the poles? Do they do any trimming themselves?

Hydro One does the trimming. They contribute to the vegetation management costs. Since we have to be there anyway, the incremental cost is minimal. And yes, they do pay for this service.

- How do you make sure that standard practices are consistently followed by vegetation management staff across your vast service territory?

We do this through our training programs and ongoing training updates.

- Is Hydro One exempt from provincial regulations banning the use of herbicides and pesticides?

We are not exempt. But the Ministry of the Environment did look at our practices and consulted with us when they developed the regulations. We have very targeted stem applications and use low volume applications. We have very specific training, certification and reporting requirements, get permission when private property is involved and we have agreements with every municipality in the province except one.

- Do you also do vegetation management on Hydro One Transmission corridors?

Yes.

Questions of Clarification Following George Juhn's Presentation:

- *Susan Frank and George Juhn noted that the 2010 and 2011 vegetation management programs have not been finalized or approved by the Hydro One Board. They are currently at the business planning stage (identifying and prioritizing requirements, outputs, costs, etc.).*
- Aren't these multi-year rather than one-year programs with cycles that have to be dealt with? You have to go back every certain number of years.

That is correct. We have a “line of sight” on particular feeders for a number of years. We go through a prioritization process and make adjustments each year based on asset condition assessment and customer needs. It is our objective, based on our filing last year, to move to an eight year cycle. That means every one of our feeders will be dealt with over those eight years, but we don’t necessarily have a specific year for every feeder.²

- How do Hydro One standards compare to those in jurisdictions with regulations regarding tree/line clearances?

Although the regulation landscape is evolving (for example, the Canadian Standards Association has recently implemented clearance requirements), in Ontario we are left to manage the risk, but we do have to follow the Distribution System Code. As indicated earlier, we trim to a standard which manages the risk of falling trees from contacting lines as well as reducing the likelihood of tree contact during the maintenance interval. Most jurisdictions allow some leeway for trees to come into contact with lines at times. If we were to clear to an absolute measure (as California does), we would require substantially increased funds.

- It sounds like you are saying that you trim trees back far enough so that the next time you come back they haven’t grown back far enough to impact the line. Did I get that right? Did you change your standard when you moved from a ten to an eight year cycle?

With the eight year cycle we will have far fewer trees that impact lines. But we can never eliminate this possibility entirely. We still have the same clearance standards as we did when we were on the ten year cycle. The restrictions on our rights of way are the limiting factor. We can not clear back further than these rights of way. This is one of the reasons we are moving to the eight year cycle, so that we can trim more frequently and reduce the likelihood of tree contacts.

- Have you looked at optimizing the trade-off between cycle length and the amount of clearing done? Different combinations may be more cost effective, especially when you consider that we have different growing seasons in the province.

The 2008 Program Review submitted as part of our last filing looked at the costs of adjustments to cycle frequency, and what other utilities have experienced in this regard. We did not look at tradeoffs between our specific clearance standards and cycle frequency. We will be undertaking such a study in the future.

- I thought you said that you routinely clear back to the limits of your rights of way. Is that correct?

It depends on the situation. Generally our rights of way are fairly narrow, so we have to clear back to the limits of the right of way to obtain clearances until we come back for the next cycle. In other situations, we may trim to the right of way limit, but large trees may still extend into the

² Over an eight-year period, Hydro One will accomplish about 100,000 km of vegetation management.

right of way which cannot be removed or adequately trimmed for a number of reasons. In general we utilize as much of the right of way as possible for clearance.

- Some species (White Birch) can grow 30 feet in eight years, so you have to come back every eight years regardless of how wide the right of way is.

In some cases that is correct. We have a myriad of vegetation situations. Our utility foresters try to develop the most effective response and an integrated approach.

- Slide 19 suggests that the longer the cycle length, the higher the unit cost. But with longer cycles you also fewer cycles. So wouldn't the cost of a five year cycle be more like half of that of a ten year cycle?

You have to take it to the next step. You have to multiply these numbers (the unit cost per km) by the accomplishment to get the total cost for the cycle, in this case 10,000 km for each of ten years times the unit cost associated with a 10 year cycle.

- None of these costs include the outage costs experienced by customers if you change the cycle length.

That is correct.

- Slide 19 is a fitted curve. Can you give us the statistics behind it, the equation and what the various tests are?

Yes, I think so. (At the break, Mr. Elias Lyberogiannis provided his contact information and requested the questioner e-mail him so that this information could be provided.)

- Slide 19 shows Hydro One costs at about \$8,400/km based on a ten year cycle. Can I assume that your eight year cycle will cost about \$6,800/km and do you have a chart for that?

The cost on Slide 19 is more like \$9,000/km. Once we achieve an eight year cycle across our system, we would expect the cost to be in the \$6,800/km range, but there will be a transition period. I do not have a chart to reflect the eight year cycle costs.

- Slide 19 uses a sample size of 5. How can you draw a statistically significant conclusion?

There are data issues. This is the best information we have. It does provide us with directional information that helps us do our financial modeling and sensitivity analysis.

- Am I correct in assuming that Slide 19 does not control for other variables, such as travel time? Perhaps the longer travel times required by Ontario's climate, size and terrain, rather than cycle times, are the key driver in Hydro One's vegetation management costs?

The cost data (\$/km treated) on Slide 19 comes from the 2008 Program Review conducted with CN Utility and does not include variables such as travel time. To get information about the factors

included in their costs, we would have to speak to individual utilities, some of whom may choose not to divulge that information. More detailed data is generally difficult or impossible to get. Travel times are clearly an important factor in our costs. Customer density is another important cost variable.

- Only 13 utilities responded to the PA Consulting study (Slide 14). What is the reason for the poor participation?

This is the challenge that we face in our benchmarking efforts. Utilities participate if they have time and see some benefit to them. In the PA study, many participants responded to only some of the questions, either because they don't have the staff or because they are not operating in the same regulatory environment.

In the PA study, we actually contacted 35 "comparables" but only 13 responded. Of those, not all provided tree trimming data.

Not everyone uses the same measures and some may not even track how many trees they treat.

- Do you have different standards as to how you trim different types of lines (i.e., single phase radial line versus a three phase circuit close to a distribution system)?

Higher voltage lines (three phase lines) get a higher priority and are treated more frequently.

Vegetation Management Facilitated Discussion

Points in *italics* represent responses or comments from Hydro One.

Question 1: Definition of Efficiency

- **How should efficiency be defined for Vegetation Management Programs?**
 - **What measures should be used to benchmark efficiency?**
 - **How much emphasis should be placed on qualitative aspects such as practices and management approaches?**
- What is the definition of "definitive information" (Slide 21), and is this actually doable? Is it your aim to increase participation?

The level of participation in previous benchmarking studies makes it clear that this is a challenge. All we can do is to try and get as much information as we can, do things that will encourage others' participation as much as possible, and then leave it to others to decide if the information is "definitive". Clearly we would like to have as much participation as possible.

In the past, we have hired a consultant who works with us to define what information is required for a particular study. This session is designed to help us define what information we would like. A consultant may come back and tell us that some of that information is simply not available. This

will in part depend on whether the information is high level or very detailed. For example, it is not likely that many utilities can provide definitive data on how long it takes our crews to get to a job site.

Are stakeholders saying that if Hydro One thinks it cannot provide definitive information that we should not proceed with the study?

- I would like to know what you are aiming at. If you think that the best data you actually get is not definitive, then you should say so. Don't just proceed assuming that you have definitive information because it was the best you could get.
- Vegetation management is a \$120 million program and about 12% of the revenue requirement, so it should be supported with a lot of data. To me, definitive means a fairly good level of detail. I would be comfortable with the same level of detail as in CN Utility study. This should be sufficient to determine Hydro One's relative efficiency for a program that is so large and expensive, although there will always be limitations. For example, a lot of utilities contract out some or all of their vegetation management, so some data will be lost.
- Both the PA Consulting and CN Utility studies used \$/km and cycle time. The OEB expressed some dissatisfaction with this. Were there other metrics in these studies and are there additional or different metrics that would help advance things?
- There were more utilities and metrics in the benchmarking studies than shown in today's slides.
- The choice of the word "efficiency" is unfortunate. This suggests it is only about economic efficiency and money. Effectiveness might be more encompassing. Reliability should be the #1 priority, then cost.
- I think efficiency includes reliability.
- The OEB has flirted with doing statistical benchmarking on some elements of cost. If this approach could be used for vegetation management, Hydro One would be considered efficient if it had actual costs that are at or below the costs that were fitted in a statistical benchmarking exercise. The advantage of statistical benchmarking is that it intrinsically deals with the comparability issues between utilities because all of the business, physical and cost environment variables (assuming you can get these data) would be incorporated in the cost equation to derive the fitted cost level. Reliability and perhaps safety could be incorporated as independent, dependent or explanatory variables. Statistical benchmarking allows you to objectively and verifiably quantify some of the things that drive costs.
- I think the OEB has fairly substantially adopted statistical benchmarking. This approach adds rigor. I don't think it is all that difficult to get the required data. For example, in the U.S. The Federal Energy Regulatory Commission (FERC) collects large amounts of lower level and raw data that can be used for this sort of analysis. In statistical benchmarking, you do not decide what the variables are - the data tells you what they are. They are either significant or not.

- Relevant cost data would include things like the percentage of line length that requires vegetation management, on and off road requirements, and service territory size.
- This is not an exercise that can be done in time for Hydro One's next filing.
- Hydro One benchmarking requires going beyond Ontario. FERC has a lot of data.
- With respect to efficiency benchmarking measures, rather than simply considering cost/km/year (a measure of efficiency for a particular level of work), it may be useful to also use a broader efficiency measure, namely total cost/total km/cycle.
- Benchmarking should be done against utilities with geographic, terrain and climate characteristics that are similar to those of Hydro One.
- The same cycle lengths may not be appropriate to both rural and urban areas. The benchmarking study should help determine this. (Jay Shepherd)
- There is merit in assessing the cost of vegetation management per unit of output. For example, what should it cost to achieve a certain level of SAIDI? This is a more important correlation than cost/km. Perhaps goals (i.e., reliability and safety) not costs should drive our analysis.
- Customer satisfaction should be a measure.
- I agree, but customer satisfaction can be difficult to quantify.
- Hydro One does customer satisfaction surveys.
- *Drawing conclusions about the relationship between vegetation management and customer satisfaction surveys may be a challenge.*
- Vegetation management costs will be higher if Hydro One "bends over backwards" to achieve high customer satisfaction ratings.
- *Hydro One does not cater to customers as an end in itself. Hydro One does exercise its property rights to get the work done even if customers at times are not in agreement.*
- At the end of the day, vegetation management spending takes place to achieve reliability. Any efficiency definitions/measures must take this into account.
- At what point do you stop spending on vegetation management to get the next increment in reliability. We need to know what additional reliability costs in order to decide what level of reliability we want. Maybe we could achieve the same level of reliability by spending less on vegetation management and more on poles.
- Shouldn't we ask customers what level of reliability they want?
- Customers should know what it will cost before deciding.

- Qualitative aspects (such as catering too much to customer wishes) should be kept in mind as explanations at the end of the process, since these factors may help to explain any significant cost differences against other utilities.
- Separate out cost drivers that you can't do anything about and list them as explanatory variables (for example, herbicide regulations). It is the drivers that you have control over (for example, work practices such as the optimal ratio of mechanical versus manual trimming), not the explanatory variables, that will explain your relative performance.
- I believe someone suggested earlier that safety was hard to quantify. I think worker safety is very important and should be included as a measure in the benchmarking study.
- *There are many metrics that measure safety.*
- I think there will be very little variation in (worker) safety statistics among reputable utilities. I doubt that many utilities track cost of safe worker practices related to vegetation management.
- Does utility safety cost data typically include or record safety-related costs for work that is contracted out?
- *Hydro One would be aware of safety incidents involving contractors and follow up, but these incidents are not included in Hydro One data.*
- So a utility that contracts out its vegetation management could have a great safety record and lower safety costs.
- Reliability is certainly a key measure of vegetation management effectiveness.
- A gross level metric you might want to include is vegetation management costs as a percentage of total OM&A costs. Any regulated utility will have to file this type of information, so you don't have to do a survey. This might be a starting point. If you are not out of synch with other utilities, why spend a lot of money doing more studies.
- In its directive the OEB (Slide 21) also expressed an expectation ("in the interim", i.e., while the vegetation management benchmarking study is being done) to see innovations that improve productivity and efficiency. Make sure you highlight these efforts in your filing.

Innovation is part of our continuous improvement process. We are a "mature" organization (policies, practices, procedures), so the process is incremental (new tools, techniques, training, etc.) rather than one in which big breakthroughs can be expected. We will highlight our efforts and accomplishments in our submission.

Question 2: Comparability Criteria

What attributes should a utility possess to be deemed comparable to Hydro One for the purposes of benchmarking?

- The OEB will want to know the characteristics of the utilities Hydro One benchmarks against. The comparability metrics you choose and how you measure these will be important. One example would be the percentage of lines that require vegetation management.
- Make sure that the utilities you are benchmarking against have/include the same costs as Hydro One. For example, Hydro One includes planning and customer notification while others may only have or show direct costs, especially if they contract out. Direct costs would be the easiest to get.
- New Brunswick Hydro and BC Hydro are reasonably comparable to Hydro One in terrain, service territory size and rural customer base. You wouldn't have to ask them for data, since it would be in their regulatory filings.
- In part, what is behind the OEB's directives is the suspicion that Hydro One is not very efficient – are you using labour and equipment efficiently, are the overheads that are being applied efficient? Hydro One has resisted providing the labour and equipment cost components for any given project. You have payroll and job code systems, so surely you could tease out forestry costs by labour and equipment utilization rates.
- Statistical benchmarking gets around comparability issues because it controls for variables so that by definition the utilities are comparable. If you control for the right variables, they don't have to be similar.
- Quebec, Michigan, Wisconsin, Maine, Oregon, Washington should be reasonable comparables to look at. Hydro One has ongoing relationships with some of these utilities.
- You could weight certain other utilities based on what type of terrain they are in.
- For rate making purposes, would the OEB be content with a fairly broad first blush measure that Hydro One is not extremely out of step with other utilities, such as Hydro Quebec or BC Hydro?
- Specific comparability attributes should include: a large rural service territory (a threshold based on the number of customers/km of line (density) or MW load/km of line).
- I'm not sure how relevant the number of customers/km of line is to vegetation management. It is more important whether the customer is on or off road – km/on road and km/off road could be treated as separate cost "buckets". But Hydro One may not account for costs in that way.
- *Generally not. We have historical data on a feeder basis. But the same feeder may be both on and off road. We estimate the cost for a feeder, but we don't have data based on separating costs per feeder for on and off road.*
- Hydro One has data that would allow you do this. You know how many feeders you have, how much is on and off road for a given feeder, and clearing standards for line crews. So you should be able to estimate costs/km for on and off road.

- Given variations in weather conditions from year to year and the impact this has on vegetation management cycles, we need more than one year or year over year comparisons with other utilities. Perhaps we should average two or three years of data.
- The OEB's OM&A benchmarking study uses three years.
- Hydro One's comparable utilities may not be comparable to all of Hydro One. You may want to seek comparability for portions of Hydro One's service territory.
- I would prefer benchmarking parts of Hydro One's mix against comparable utilities rather than using a very small group of comparables for all of Hydro One.
- Hydro One's several and distinct service areas, which in turn affect vegetation management costs, are differentiated by vegetation type and growth rates, climate, etc.
- Hydro One has made the argument that if they have more money for forestry, total forestry cost will be reduced over time. I would like to see more "internal benchmarking" – is Hydro One's performance improving over time – rather than only benchmarking against others.
- Hydro One gets certain efficiencies from the fact that the same vegetation management resources are used in both its Transmission and Distribution systems. This may affect comparisons with other utilities.

Question 3: Confidentiality

Could the study findings and results remain confidential to increase the likelihood of utility participation?

- I do not think confidentiality is such a big issue. It is understandable that other utilities may want confidentiality in a report such as that by CN Utility. In that study, data cannot be linked to specific utilities, since they are only identified by a participant number. Hydro One should not be concerned about its own confidentiality, since the study will go to the OEB, a public forum.
- *The CN Utility study was a proprietary study which they marketed and to which Hydro One subscribed, but we did not commission it. CN made a commitment to the utilities that provided data that their specific information would remain confidential.*
- *I think I'm hearing that if Hydro One were to RFP a study that requested data that was similar to what was in the CN Utility study that would satisfy stakeholders and the OEB. If Hydro One asked CN Utility to do a benchmarking study for us, there may still be a concern with getting other utilities to provide data, knowing that the study will be filed with the OEB.*
- This sort of thing happens all the time. No one here is asking for information about specific utilities (only where Hydro One fits in relative to other utilities), so there should not be a confidentiality concern. There are also other firms that do this sort of work, such as Environmental Consulting Services (ECS) in Seattle.

- Utilities know that they get nothing in return (except a report) for their participation in these studies. It might be better to contact utilities directly that Hydro One deems to be comparable (and especially those with which Hydro One has a relationship) and perhaps go and visit them. You might get a lot more information this way.
- A general survey based on publicly available documents filed with regulators that compares forestry costs to general OM&A might be a good starting point and avoids any concerns about confidentiality that are perhaps inherent in private surveys such as CN Utility.
- Since confidential documents will only be available to intervenors, and not the public, the OEB has expressed a general preference to avoid the filing of confidential documents if at all possible. Utilities often argue that there are in effect two levels of confidentiality; information that can be provided under OEB rules, and information that cannot be provided at all. If utilities have relevant information, the OEB will want to see it. Utilities do not get to decide.
- The OEB's confidentiality rules will not assure survey participants in other jurisdictions. They may be comfortable if they are only identified by a number and described in terms of comparability attributes.
- Virtually all regulators have more or less the same rules regarding confidentiality. My concern isn't confidentiality. This can be addressed by only identifying participants by a number, as in the PA and CN studies. The key is that we actually have survey participants (and enough of them) that are comparable to Hydro One or its geographical pieces. Without this, we will not be able to draw any meaningful conclusions.

Overview of Density / Cost Allocation Presentation

Points in *italics* represent responses or comments from Hydro One.

Questions of Clarification following Mike Rogers' presentation:

- Do the density zones in Slide 3 include only Residential customers?

No. They also include General Service customers.

- Does General Service have two or three categories (Slide 3)?

General Service has only two categories. The Urban and Low density categories include General Service. There is no middle category for General Service.

- Your example (Slide 6) looks circular to me. Everything feeds off the number of customers (density). Your example assumes that the number of customers in any given length of feeder is the same. In the first feeder, you have customers in three different classes, but they each require a proportionate amount of feeder. You are assuming every customer uses the same kilometres of line. That does not seem right to me.

Yes, the assumption is that each customer in a class uses the same length of feeder as every other customer in the same class. For distance, it is pretty hard to do it any other way. How else could you allocate the feeder length across 35 customers except by using the weights? We do not track costs separately by density or customer class. The weightings give us a reasonable proxy.

- Slide 6 simply assumes that costs are proportional to distance, but the classes in Slide 6 do not necessarily have to be defined by density. You could have cost allocation reflect density without assuming customer classes based on density. If density is a determination, do we actually want to define customer classes using density? All Slide 6 is trying to say is that regardless of where customers fall, there is an average number of kilometres required to serve each class. Each feeder has a different level of density (customers/km) but all four classes are being served off each feeder. The slide is trying to take into account that the mix of long and short feeders varies. This is simply one way of coming up with weightings - by assuming costs are proportional to distance.
- If I understand Slide 6 correctly, the principle is that the denser urban type customers should not have to pay for long lengths of line that they do not use. Does it not depend on where that urban density is on the feeder? What if it is at the end of the feeder?

Correct. To be more precise, the urban customer should pay less per unit of supply than customers that are in a less dense area.

- Since you acquired many of the urban areas that were previously separate systems, the notion that you have long feeders with various densities on them is not accurate. For the most part, you have a

system in towns that serve that town, which in turn is connected to your broader system that serves medium and low density areas.

The only thing that the acquired utilities have in common is that they were acquired. We have utilities like Caledon with 6,000 or 7,000 customers and Arkona with less than 300. The fact that they were acquired does not mean that they cost us less to supply than other utilities.

- I am raising a question of system architecture. Places like Brockville or Carlton Place represent the bulk of your urban customers - a system in a town that serves a town, rather than a line that has urban and rural customers on it.

Most of the 880,000 residential customers (Slide 3) are not in urban areas. Only 11 of the 88 acquired utilities met the urban density definition.

- 40% of your urban customers are in the acquired utilities. The rest you already had, and in similar towns. So is your architecture in those towns different than in Brockville or Carlton Place?

It is not a foregone conclusion that they are isolated and fed out of one DS (Distribution Station) specifically for that area because what happens is that the rural feeder goes outside that community so there are points of demarcation. We would have to do some further investigation

- I think what is being asked is whether the urban density criteria drive system architecture.

No they don't.

- What I am saying is that most of Hydro One's urban customers are on a feeder that is almost entirely urban customers. This needs to be understood to do a proper study.
- The classes don't necessarily have to be defined by density in order to use a density based allocation process (Slide 7). For example, you could have Sentinel or Street lights on this slide as a class and look at the number of lights hooked up to various lengths of feeder and go through the math as you did on Slide 6 and come up with a density based weighting for them.
- Seasonal used to be density based but it isn't any more. Yet it has a density weight factor on Slides 7 and 9 (1.20/1.60), while Distributed Generation (DG) is not density based (weight factor of 1.0). DG is an anomaly on the slide.

Yes, we could look at that, but this is a zero-sum game. A number of less than 1.0 attracts less cost, and a number of more than 1.0 attracts more cost. If I give Seasonal a weight factor of 1.0, other customers will have to assume more cost in order to meet the revenue requirement.

- Why do Street Lights (Slide 7 and 9) pay more than an urban residential customer?

I believe that is the way the OEB's cost allocation does it.

- On Slide 9, the transformer density weights for GSe and UGe don't look right. You haven't just taken the GSe customers and said we have to figure out a density weight to split them between urban and non urban. You've also said let's reallocate between GSe and GSd. So in effect you have split two classes into four.

General Service energy billed and demand billed are treated as one group.³

Density/Cost Allocation Study Facilitated Discussion

Points in *italics* represent responses or comments from Hydro One.

- It is not a question of whether this is the right time to look at Density/Cost Allocation. The OEB directed Hydro One to look at this.

At the same time the OEB put out a staff paper suggesting that density should not be a factor. So there is a conflict. So the first question is indeed whether this is the right time. They also didn't realize that we would be coming back so quickly.

- The OEB asked that Hydro One look at the relationship between density and cost allocation and the extent to which it may be an issue. If you answered this question, it would help understand the extent to which and exactly how density drives cost and whether you have the right relationship in the way you do the calculation now (Your current approach is linear and done on a feeder basis). If you go back to first principles and ask what the relationship is and how to best reflect that relationship, then you could ask whether and when you should do anything about it. This approach might also inform the staff paper. If density does make a material difference, then there is a policy decision to be made, but at least you will have the information to help inform that decision.

I think in reality you are enunciating a principle: start by getting an understanding of your system and how the costs differ by density - but it is not an allocation discussion. Why wouldn't this be what we file?

- Yes, I think that would respond to the OEB's directive, which was to look at the relationship between density and cost allocation. Cost allocation is cost drivers, so how does density impact system cost drivers. The next step would be that if density is a factor, how do you reflect this: by allocating cost or by how you define customer classes?
- What the OEB said was: "The Board remains concerned that there may be factors that make it less costly to serve the acquired distributor territories than legacy systems, but this conclusion could not be reached on the basis of the cost allocation information provided by Hydro One. Hydro One has not established that there is no significant difference in serving residential customers of acquired distributors compared to legacy customers." The OEB is saying that more rigorous

³ The response given at the meeting was not accurate. Subsequent to the meeting Mike Roger confirmed that General Service is treated as two separate groups in developing the Density Weights: one group for General Service energy billed, (small General Service urban and non-urban) and one group for General Service demand billed, (large General Service urban and non-urban).

information is needed on the cost causality between urban and non urban areas. Figure out how density affects cost causality – basic work on what actually drives cost.

- *Is all the work that the OEB has already done on cost allocation a given or are we questioning those rules, which included general service residential?*
- We can't reinvent the wheel.
- Only to the extent that density has an impact on the relevance of cost drivers. For example, after 2011 density won't have an impact on meter reading costs because you won't be sending around trucks to read meters. All we are saying is go back and think about where and how density has an impact? It may be exponential rather than linear.

Because we currently have a density factor for both residential and general service, do we need to look at both?

- I think it is more fundamental than that. I don't understand why, if all your street lights happen to be on urban feeders because they are in towns, they have a weighting of 1.0 rather than less than 1.0, or why sentinel lights on farms don't have an allocation factor higher than 1.0? It is not just a matter of looking at the classes you use now.

So it's a discussion to agree on principles rather than the allocation factors?

- Yes, but you have to go beyond a conceptual discussion. Where would I reflect these principles and numerically, how would I do it.
- I think it is much more rigorous than that. You have to take your cost allocation breakdown (study) and split up each of the customer classes that have a density component into two classes and allocate the costs in that class to the two classes or however many it is on some principled basis.

Shouldn't we have the principles first or do you just want us to run a bunch of scenarios?

- Of course you have to figure out the principles. But what you are suggesting is that you will submit principles for this filing and worry about the details later. My schools are paying a million dollars a year extra versus last year because of your approach.

You are paying what the OEB determined was appropriate. The OEB approved the rates. There is no "extra".

- What was the OEB's underlying concern regarding schools?

The OEB said that Hydro One had not presented sufficient evidence concerning the service cost difference between urban and rural customers.

It became an issue because the impact was significant.

- The customers of acquired utilities were frozen while everyone else got hit with big increases. So there is a big catch-up.
- Schools paid \$1.2 million less for five years.
- The end point is that Brockville customers pay twice as much as Belleville.
- Brockville is a lot smaller than Belleville.

And perhaps the services provided, or their asset condition, is so fundamentally different that the costs are different.

The key question is how far should we go with the OEB's directive at this point in time? How much do we do with this? If stakeholders think there is no merit in doing this right now, I could inform the OEB accordingly. That is an option.

- It depends in part where Hydro One wants to end up with this at the end of the day. You do have the OEB's staff paper that says density should not be an issue. You could have acquiesced when the OEB's cost allocation came out and changed your costs accordingly. You must feel that there is some merit in having a density based customer classification. Having more factual information on the table before the OEB reaches its final conclusion on customer classification would be a good thing.
- Most people would support the idea that there ought to be recognition, at least on final customer bills, of the different costs involved in serving low versus high density customers. I think OEB staff was saying that it may not be necessary to base customer classification on density, but that doesn't necessarily mean that cost allocation per se can't be based on density. They were talking customer classification not cost allocation directly.

If you don't have customer classification separated by density, why would you do cost allocation.

- The only way you can affect rates is by classification determinants.
- Assuming that density is a factor in determining costs, and even if classes aren't density based, you could still get a more appropriate allocation in each class.
- You could base customer classification on demand levels, rather than density.
- Urban and rural customers are assumed to drive the same costs, based on their usage.
- No, that's just the way you classify them. That is looking at it "horizontally". Another way to look at it is with a "vertical" "slice, which would say that low density causes costs to be higher for a

customer in the same classification. For example, a 5 KW urban customer has lower costs than a 5 KW rural customer.

If you don't have separate customer classes, what is the point of allocating? You would end up with one rate for all the residential customers using 5kw or less, regardless of density.

- Because you would get a better allocation between the classes you do have, and if there is a fundamental difference, it gives you some justification for having density based customer classifications.
- I agree that you have to have distinguished rates. But you could, for example, have a residential class under 5 KW and within that have different rates based on density.

In a matrix of factors, if you decide you want to use three levels of consumption, the current three density-based residential classes would become nine.

- You need to understand how Hydro One's system architecture drives costs and then address how best to translate this understanding into cost allocation.
- *I see us getting there but struggle with doing it all today. My concern is that customers pay what is fair and equitable and consistent over time. We don't want to introduce volatility in rates unless we have something better to move to*
- If the School Energy Coalition were to retain a rate design/cost allocation specialist to look at Hydro One's costs to serve towns, will you provide us with the raw data?

We can't commit to that unless we understand exactly what data would be required and in what level of detail. We can't agree in advance to provide information if we don't know what the questions are. I'm not even sure we have the data you might want. We don't gather costs. We do things based on allocation. We do not have data that tracks costs by urban or rural areas. Crews don't charge work based on boundary lines or by on/off road.

- I don't think Hydro One can respond to the OEB directive with existing data. You will have to do some specific studies. I don't think this can be done by July. You should also start from a clean state, rather than from your existing density classifications. These demarcations may be wrong today. I suggest you ignore the urban 3,000 classification, which was done for political reasons to forestall annexations.

We need to figure out what the principles are before we chase data. If we take the approach of starting with first principles, we would ask questions like: what are the density factors that drive costs (is there a relationship); are there logical demarcation points (the current ones may not make sense in the future). We don't gather cost information on this basis today.

- You could have an apartment block in that has 1000 units served by one transformer, so density is certainly a driver of cost.

- Hydro One has an existing cost allocation spreadsheet in which Mike Roger's formula splits up by density some of the costs in some classes. Can we have this?

It was filed with the OEB as part of the cost allocation study (G2.1.1- Attachment A).

- So we can take your cost allocation study and see what it costs to service a general service customer in a town.

When you get to the towns, we don't have cost. You will see an allocation of cost.

- So we will be able to compare Hydro One's cost allocation for small towns and compare it to other utilities (who file with regulators) so Hydro One can explain any big differences.

For UGe, Hydro One has an entire system wide process that we allocate to this class. You would be comparing very different systems.

- The cost allocation system is supposed to allocate cost to classes to get a correct cost causality connection to set proper rates.

When the OEB asked utilities do cost allocation, they gave utilities the option of doing bulk, primary or secondary. Hydro One is the only one that uses bulk, so when you look at other utilities, some of those costs do not reflect cost causality because they are subsidizing other classes. You won't be comparing apples to apples.

- It seems clear that Hydro One does not want to do a study.

We do not want to incur costs for a study that customers ultimately pay for if there is no clear benefit. So what can we do that has value. I agree with what some stakeholders said earlier – focus on principles and understand the underlying drivers. If you don't like these densities, what are the factors we should consider –and what alternatives are there?

- What if we went back to first principles and abandoned the idea of classification and cost allocation based simply on end use and demand. The cost of service per customer increases with higher levels of demand on the system. As you go from high density to low density the same level of demand costs a different amount to serve. There is recognition historically that costs and rates should vary with demand – and I am saying that costs should also vary with density. So why not charge for energy used, plus an account level charge based on density - which I suppose in effect creates a sub rate class. I don't think you can say that density makes a difference without accepting a proliferation of rate classes.

Hydro One has 12 rate classes as opposed to four or five for other LDCs.

- Having split classes by density, the OEB asked Hydro One to identify and explain the cost differences to serve different levels of density. You have to know this to set rates.

- Hydro One has a system expansion charge. This should be recognized in first principles. Another issue to keep in mind is how underground line costs are allocated between urban and rural customers.

Underground lines are about 5% of total lines.

Hydro One recognizes the frustration around whether customers are really paying what it costs to serve them. The answer is that you are getting an allocated share as opposed to what it really costs because we don't have that kind of information. Our systems today don't allow us to do it. So what progress can we make on this issue that has merit without being ridiculously expensive to do it? I'm ok with a principles discussion but I'm not certain how much merit there is in going further.

- All those utilities you bought were originally formed because it was perceived they would have lower costs. You could check whether this is true by taking, for example, Brockville (arguably urban without fitting into your urban definition) and tease out the costs, and see how different these are from Hydro One's average cost. This will tell you whether there really is an issue. I think there is.

The costs we have are those at the time we bought them. We never got the full details that would allow us to run a cost allocation. Once we acquired them, we no longer ran them on a stand-alone basis.

- Perhaps you can't do it on paper. You go and actually look at what the physical assets are to figure out what the costs are.

We know what the assets are but we can't tell you what it costs to work on them in that location. Crews work on a geographic basis and do not record specifically where they work (urban versus rural). A crew might work on a feeder but they don't record what percentage of their work occurred in any specific rate class. We account for costs on an allocation basis.

- I think you are stone-walling.

Keep in mind that it makes no difference to Hydro One what customer group pays for what. We will still recover the full revenue requirement. Why would I stone-wall if there were a logical and clear alternative that is truly cost/class driven and better than what we are currently doing? We don't want volatility because we believe it is bad for customers. If you have a better method, please tell us.

- Will Hydro One give us the data so that we can calculate the better method?

You keep thinking we have data that we do not have.

- So you are talking about creating a theory. When do you test the theory with data?

Our first step should be to get some agreement on the factors that drive costs, and how density and costs are related. Then we can go and price things. Let's do it step by step and not waste effort because effort costs money. Money raises rates. So the first step is to identify factors and get some agreement at the next stakeholder session. We could then get cost data on the agreed to factors. This is a working with people approach, rather than us going away to do something and then fighting about it.

- How can we provide you with input if we don't have the data to know what the cost connections are?

You have the data from the spreadsheets and that is as good as you are going to get.

- Do you collect data by service centre?

There is some split by zones. I would have to check (George Juhn). There is a difference between telling someone where to show up to work today versus what we can extract once the work is done. We charge time to a work order but it is not location specific.

- You have major work programs like forestry, poles and station work. Perhaps you can extrapolate from these programs what your total costs are relative to your average costs, thereby telling you if whether you have a density cost driver issue significant enough to change your customer classes.

If we have assets in an area undergoing significant work, the numbers will be skewed. We'll check to see what type of regional data we can extract from our systems.

How would you separate urban and non-urban within the regions?

Urban/non urban may go out the window. I'm not pre-supposing that the current definitions will continue. Anything is possible. I don't have a preference as to how it turns out as long as we change things only once and gradually move to it. Stability of rates is important. Let's move to something else if it makes more sense and is logical.

- *The next steps then are for Hydro One to bring to the next stakeholder meeting for discussion: some principles as to how density and costs are related and what the factors are that go into that; and, information as to what sort of regional and other cost data is available to help answer density questions.*
- I think you should write a letter to the OEB stating that Hydro One will not be doing the study. Please copy stakeholders. (Jay Shepherd)

That is good advice. I may have to write a letter saying what kind of study we will undertake. We scope the study. The letters will also likely say that we have had a discussion with stakeholders and as a result we have identified two items to start on, but that we don't know yet what the full study will look like at the end of the day, so we will take it in phases. (Susan Frank)

- Will you tell the OEB that there is strong opposition to your approach?(Jay Shepherd)

Is there? I know you are not happy and that you want us to go all the way, but I don't know with what and how. Are other people unhappy? I hear from some that we should do nothing and maintain the status quo, so perhaps there is strong opposition to doing anything. There certainly isn't uniform strong opposition to what we are proposing.

- It is the wrong time to rock the boat with all these other things going on. (John McGee)
- I have some concerns about density, but I think the staged approach seems like a good idea. (John Armstrong)
- I agree. (Judy Kwik)
- I think we need a better understanding of what data we have. I agree with the idea of getting at some principles. (Peter Faye)
- I agree with the principles approach and the need to understand better what drives costs.(Bill Harper)