

## SUSTAINING OM&A

### 1.0 INTRODUCTION

Distribution Sustaining OM&A represents expenditures required to maintain existing distribution lines and stations facilities so that they will continue to function as originally designed. Hydro One Distribution manages its Sustaining OM&A program by dividing the program into the following four categories:

- Stations
- Lines
- Vegetation Management
- Meters, Telecom, and Control

The expenditures covered under the Sustaining OM&A program are intended to maintain or improve the reliability of the system, where it is cost effective to do so, deliver on customer commitments, and ensure all legislative, regulatory, environmental and safety requirements are met. Hydro One Distribution sustaining OM&A programs and proposed spending levels for 2010 and 2011 are described herein.

### 2.0 DISCUSSION

Distribution assets and their components are subject to deterioration and failure over time. Appropriate maintenance practices ensure that the life of assets is optimized and will help protect against major equipment failures and associated reliability problems. Maintenance programs are designed with recognition that asset integrity is influenced by factors such as condition, design, environment, deterioration with age, and equipment utilization. As assets deteriorate, equipment performance usually suffers resulting in increased environmental risks and an increase in potential safety hazards to both the

1 public and employees, and a decrease in system reliability. Ultimately, assets will  
2 deteriorate to the point that they are no longer able to perform their function(s)  
3 effectively, or costs of maintaining the asset exceed the costs of replacement. At this  
4 point, it becomes more cost-effective to replace an asset rather than to continue to repair  
5 or maintain. Replacement of capital assets is discussed in Exhibit D1, Tab 3, Schedule 2.

6  
7 Sustaining OM&A programs fund both planned and unplanned work. The planned  
8 programs represent the work required to preserve the functionality of the distribution  
9 system by maintaining or replacing components and managing rights-of-way to ensure  
10 vegetation growth does not adversely affect system reliability. The determination of  
11 which specific facilities need to be maintained is, in part, based on the comprehensive  
12 Asset Condition Assessment (“ACA”) process described in Exhibit D1, Tab 2, Schedule  
13 1. The condition of assets is one consideration in determining the need to schedule  
14 maintenance. Other factors include historical performance, asset criticality, asset  
15 demographics, availability of spare equipment and material, and local customer impacts  
16 as detailed in the investment planning process discussed at Exhibit A, Tab 14, Schedule  
17 5. The work is subsequently prioritized using the process described in Exhibit A, Tab 14,  
18 Schedule 6 which allows all distribution programs to be ranked and compared to one  
19 another so that investments can be directed to where they provide the maximum business  
20 value.

21  
22 Sustaining OM&A also includes unplanned work, more commonly referred to as demand  
23 work. Demand work involves responding to customer outages and restoring power on a  
24 twenty-four hour basis, responding to safety issues, managing billing meters to ensure  
25 they are replaced upon failure, responding to customer requests to remove hazardous  
26 trees, responding to requests to locate underground power cables, and replacing or  
27 repairing failed equipment among other needs. The variable nature of this work requires  
28 Hydro One Distribution to forecast costs based on historical averages of cost and volume

1 of work, with adjustments made to reflect anticipated changes in expenditure patterns and  
 2 work requirements.

3  
 4 Demand work requires an immediate or timely response to customer, safety and system  
 5 needs. This work is initiated by interruptions to service, line and station inspection  
 6 findings, and customer and property owner requests. Hydro One Distribution maintains  
 7 infrastructure, equipment and resources to respond to these issues within the appropriate  
 8 time frame as they arise. Not all demand work poses the same degree of urgency, and  
 9 this work is scheduled over an appropriate timeframe given the nature of the demand  
 10 work and the potential for coordinating it in a cost effective manner with other work  
 11 where appropriate.

12  
 13 The spending for 2010 and 2011, along with the spending levels for the bridge and  
 14 historic years are provided in Table 1 below.

15  
 16 **Table 1**  
 17 **Sustaining OM&A**  
 18 **(\$ Millions)**  
 19

Description	Historic (Actual)			Bridge 2009	Test	
	2006	2007	2008		2010	2011
Stations	26.0	25.0	26.4	21.5	30.2	30.8
Lines	126.5	123.1	132.7	130.3	140.2	148.2
Meters, Telecom, & Control	9.1	9.5	7.2	8.4	14.9	16.8
Vegetation Management	89.1	115.0	118.2	136.1	133.2	144.6
<b>Total</b>	<b>250.8</b>	<b>272.6</b>	<b>284.5</b>	<b>296.4</b>	<b>318.5</b>	<b>340.5</b>

20  
 21 The change in overall spending for 2010 and 2011 relative to historic expenditures is  
 22 largely attributed to the following:

- 23  
 24 • Continuing efforts to reduce the vegetation management cycle to manage costs and  
 25 improve reliability;

- 1 • New expenditures to inspect and test oil-filled stations and lines equipment to meet
- 2 requirements set out by new PCB regulations;
- 3 • Increased efforts on lines maintenance, particularly in the area of submarine cables
- 4 and on defect corrections to manage reliability and safety.
- 5 • Management of the Smart Meter network data flow to IESO data warehouse for those
- 6 meters installed prior to December 2008.

7

8 These increases are discussed in more detail below.

9

## 10 **2.1 Stations**

11

12 Hydro One Distribution owns and operates 1,005 distribution and regulating stations  
13 province-wide. Stations are used for the delivery of power, voltage transformation, and  
14 switching. Station facilities typically contain the following components: power  
15 transformers, instrument devices, fuses, reclosers, disconnect switches, bus, insulators,  
16 support structures, power cables, cable terminators, surge arresters, station service  
17 supplies, grounding systems, fences, and mobile substation facilities.

18

19 Stations sustaining OM&A covers investments required to maintain existing assets  
20 located within distributing stations, regulating stations, as well as Hydro One  
21 Distribution's 28 mobile substations. The work is divided among three programs and the  
22 funding for the 2010 and 2011 test years, along with the spending levels for the bridge  
23 and historic years, are provided in Table 2 below.

24

**Table 2**  
**Stations Sustaining OM&A**  
**(\$ Millions)**

Description	Historic (Actual)			Bridge	Test	
	2006	2007	2008	2009	2010	2011
Stations Demand and Corrective Maintenance (d)	7.0	6.9	7.1	5.7	6.9	7.2
Planned Station Maintenance	12.1	13.1	12.8	13.5	17.5	19.6
Land Assessment and Remediation	6.9	5.1	6.5	2.4	5.7	4.0
<b>Total</b>	<b>26.0</b>	<b>25.0</b>	<b>26.4</b>	<b>21.6</b>	<b>30.2</b>	<b>30.8</b>

(d) – indicates this is a demand program

**2.1.1 Stations Demand and Corrective Maintenance**

This program covers emergency work required to respond to component failures at distributing and regulating stations, correct situations where there is a likelihood of failure that could cause a power interruption or present a safety hazard, and to complete unplanned corrective work discovered during planned maintenance activities that cannot be deferred until the next planned maintenance. When station components fail, the consequence is typically a service interruption to customers. Station interruptions can impact a large number of customers, typically from 1,000 to 10,000 customers per interruption. Emergency and corrective maintenance work must be carried out in a timely manner in order to minimize the risks to customer reliability and safety.

In most cases, smaller components such as insulators, connectors, switches, etc. will be repaired, temporarily bypassed, or replaced on site. The failure of a large component, such as a transformer, may require moving the equipment off site and repairing it at a central location. If a prolonged service interruption is anticipated, service is typically restored through the temporary use of a mobile substation.

1 The 2010 and 2011 spending requirements for this program are \$6.9 million and \$7.2  
2 million respectively. These amounts are within 3% of historic expenditures. One trend  
3 that influences this spending requirement is a reduction in transformer corrective activity  
4 as a result of fewer failures. Improving failure statistics are attributed to increases in  
5 preventative maintenance as discussed below. These savings have been offset in recent  
6 years by corrective action required to address copper theft and a number of site security  
7 and safety problems.

8  
9 2.1.2 Planned Station Maintenance

10  
11 The planned station maintenance work program includes station inspections, power  
12 equipment maintenance, asset condition assessments, grounds and site maintenance,  
13 maintenance of mobile substations, and PCB testing and retro-filling. A planned  
14 maintenance program is required to reduce the risk of equipment failure, which can  
15 impact reliability of service to the large number of customers typically supplied from a  
16 station. Planned maintenance is also critical to minimizing life cycle costs and limits the  
17 amount of unplanned corrective maintenance and capital replacement in future years.  
18 The maintenance expenditures for the majority of activities have remained steady and are  
19 planned to remain steady during the 2010 and 2011 period. The one large exception to  
20 this is PCB testing and retro-filling, which accounts for the majority of the overall  
21 increase in costs for 2010 and 2011 in relation to historic years. This increase and the  
22 PCB testing and retro-filling activities are discussed at the end of this section.

23  
24 Station inspections are required by Appendix C of the Distribution System Code and are  
25 to be undertaken on a regular basis to identify obvious structural problems, hazards,  
26 equipment defects and signs of vandalism. Hydro One Distribution's stations are  
27 inspected two times per year in rural areas and monthly in urban areas. Inspections  
28 identify obvious problems and safety hazards prior to initiating planned maintenance

1 work. The 2010 and 2011 spending requirements for this activity is \$2.2 million and \$2.3  
2 million respectively, which is the same level spent historically on this component of the  
3 program.

4  
5 Power equipment maintenance and asset condition assessments are performed routinely  
6 and target critical modes of failure along with conditions that impact the equipment  
7 performance. For station reclosers, airbreak switches, circuit switchers, high voltage  
8 fuses, and transformer underload tap changers, maintenance occurs approximately every  
9 6 years. In addition to this routine maintenance, equipment maintenance also covers mid-  
10 life maintenance overhauls on major equipment, transformer diagnostics and technical  
11 services. The spending requirements for this work account for the bulk of the planned  
12 maintenance spending requirements, and total \$9.6 million annually in 2010 and 2011.  
13 The test year funding is consistent with escalated historical spending levels and reflects  
14 the scheduled equipment maintenance and diagnostics activities planned for the test  
15 years.

16  
17 Planned station maintenance activities also fund grounds and site maintenance work such  
18 as weed control, snow removal, fence repair, access road maintenance, site drainage, and  
19 foundation repairs. The 2010 and 2011 spending requirements for these activities are  
20 \$1.2 million and \$1.3 million respectively, which is the same level spent historically on  
21 this component of the program.

22  
23 Planned maintenance of mobile substations is also required to ensure these critical units  
24 are available and in good working condition when required. Hydro One Distribution's 28  
25 mobile substations play a key role in providing reliable service to customers as they  
26 provide emergency backup, should a distributing station fail, and facilitate planned  
27 maintenance programs at distributing stations, as well as providing load relief during  
28 heavy load periods in the summer or winter. The cost to maintain the mobile substations

1 in 2010 and 2011 is \$0.7 million and \$0.8 million respectively. This is the same level  
2 spent historically on this activity.

3  
4 In addition to the planned station maintenance requirements outlined above, Hydro One  
5 Distribution is now required to significantly increase Polychlorinated Biphenyl (“PCB”)  
6 testing and disposal within stations due to new PCB regulations (i.e. amendments to the  
7 Canadian Environmental Protection Act) brought on by Environment Canada and passed  
8 into law in September 2008. These regulations require the elimination of PCB  
9 contaminated oil above 500 ppm in station equipment by 2009 and above 50 ppm by  
10 2025. As detailed in Exhibit D1, Tab 2, Schedule 1 Asset Condition Assessment &  
11 Analysis, prior to the new regulations, Hydro One Distribution focused PCB testing on  
12 equipment with large volumes of oil (e.g. station transformers) as they posed the greatest  
13 environmental risks. With the new regulations in place, Hydro One Distribution must  
14 now also focus on testing equipment with smaller volumes of oil (e.g. bushings,  
15 instrument transformers).

16  
17 Currently, Hydro One Distribution does not have PCB test results for over 80% of  
18 transformer bushings. PCB tests on bushings within a station is a very time consuming  
19 process (i.e. several days) that requires a planned transformer outage, the usage of a  
20 mobile substation (i.e. MUS) to mitigate customer power interruptions, oil sampling, and  
21 lab testing. Oil that may exceed PCB limits will also be retro-filled. As a result of this  
22 process, Hydro One Distribution has notified Environment Canada that it is unable to  
23 conduct all the necessary tests in 2009 to comply with the 2009 obligation to retire PCBs  
24 in excess of 500 ppm. Based on previous tests, between 5% and 10% of untested oil  
25 filled station equipment has PCBs in excess of 50 ppm and less than 1% has PCBs in  
26 excess of 500 ppm. Hydro One Distribution will endeavour to test all outstanding station  
27 equipment by 2014. To conduct the necessary PCB tests and retro-fills, spending of \$3.8  
28 million in 2010 and \$5.6 million in 2011 is required.

1 In total, the 2010 and 2011 spending requirements for Planned Station Maintenance is  
2 \$17.5 million and \$19.6 million respectively. Aside from natural cost escalation, the  
3 increase in spending is almost entirely attributed to the increased need for conducting  
4 PCB tests on station equipment in response to new PCB regulations.

5  
6 2.1.3 Land Assessment and Remediation

7  
8 Hydro One Distribution owns 1,005 distribution and regulating station properties across  
9 Ontario. Soil contamination has occurred over time within some of the properties as a  
10 result of the following: application of certain long lasting chemicals, such as wood  
11 preservatives and arsenic-based herbicides; storage and use of mineral insulating oil, fuel,  
12 PCBs, and miscellaneous other materials. The historical use and storage of these  
13 materials and chemicals met all applicable environment regulations and guidelines at the  
14 time they were first used. Approximately 45% of station properties have some level of  
15 on-site soil contamination, exceeding applicable Ministry of Environment land-use  
16 criterion. Because contaminated properties have the potential to cause adverse effects on  
17 people and the environment, Hydro One Distribution has undertaken to assess its  
18 properties and carry out remedial work where environmental risks are significant. The  
19 ACA process described in Exhibit D1, Tab 2, Schedule 1 provides additional details  
20 concerning Land Assessment and Remediation.

21  
22 The Land Assessment and Remediation program's primary focus is to reduce the human  
23 and ecological risk of off-property impacts. This is done through either the  
24 implementation of remedial measures to treat, remove or otherwise manage the  
25 contamination found off-site or the implementation of on-site management controls to  
26 mitigate future off-property impacts.

1 The 2010 and 2011 spending requirements for this program are \$5.7 million and \$4.0  
2 million respectively. This level of funding is required to complete assessments and  
3 required remedial work on priority sites. The expenditures align with a managed  
4 remediation plan to address all high to medium risk sites. Historic costs vary year over  
5 year due to the complexity and volume of work needed to address the particular sites  
6 being assessed and remediated during any given year. The 2009 expenditure level is  
7 particularly low as work was deferred to assess progress on the overall remediation plan.  
8 In 2010 and 2011, expenditures increase but remain below the historic average.

9

## 10 **2.2 Lines**

11

12 Distribution lines total 120,200 circuit km province-wide and are used to deliver power to  
13 Hydro One Distribution customers. Lines are constructed on road allowances where  
14 possible, or on rights-of-way that Hydro One Distribution has the legal right to occupy.  
15 Line components include poles, conductor, transformers, switches, fuses, surge arresters,  
16 voltage regulators, capacitors, insulators, guy anchors and reclosers.

17

18 Funding under lines sustaining OM&A provides for investments required to maintain the  
19 integrity of the distribution lines system. The work is divided among four categories,  
20 and the funding for 2010 and 2011, along with the spending levels for the bridge and  
21 historic years, are provided in Table 3 below.

22

**Table 3**  
**Lines Sustaining OM&A**  
**(\$ Millions)**

Description	Historic (Actual)			Bridge	Test	
	2006	2007	2008	2009	2010	2011
Trouble Call Response, Cable Locates and Disconnects/Reconnects (d)	89.2	78.6	91.5	83.4	87.0	90.8
Line Maintenance	26.7	30.2	26.8	30.6	31.2	29.9
PCB Equipment & Waste Management	3.2	3.1	3.7	5.7	9.4	15.0
Other Services	7.4	11.2	10.7	10.7	12.5	12.5
<b>Total</b>	<b>126.5</b>	<b>123.1</b>	<b>132.7</b>	<b>130.3</b>	<b>140.2</b>	<b>148.2</b>

(d) – indicates this is a demand program

**2.2.1 Trouble Calls, Underground Cable Locates, Disconnects/Reconnects**

These demand programs provide funding for responding to customer service interruptions and power quality concerns and for customer-driven service response activity. The externally driven nature of this work requires Hydro One Distribution to forecast costs based on historical averages with adjustments made to reflect anticipated changes in expenditure patterns or work requirements. The funding is divided into three programs as shown in Table 4.

**Table 4**  
**Trouble Calls, Locates, Disconnects/Reconnects**  
**(\$ Millions)**

Description	Historic (Actual)			Bridge	Test	
	2006	2007	2008	2009	2010	2011
Trouble Calls (d)	70.9	57.6	69.5	62.3	65.3	68.2
Underground Cable Locates(d)	10.7	12.4	13.7	12.4	12.8	13.3
Disconnects/Reconnects (d)	7.6	8.6	8.3	8.7	8.9	9.3
<b>Total</b>	<b>89.2</b>	<b>78.6</b>	<b>91.5</b>	<b>83.4</b>	<b>87.0</b>	<b>90.8</b>

(d) – indicates this is a demand program

1 Trouble Calls

2  
3 The Trouble Call program is required to address unplanned power interruptions to  
4 customers, customer power quality related complaints, and the emergency repair of  
5 equipment and component defects found on the distribution system.

6  
7 Unplanned power interruptions on the distribution system are largely due to line  
8 component failures or contact with right-of-way vegetation (trees). Line component  
9 failures can be caused by severe weather conditions (e.g. snow, ice, wind, lightning) and  
10 are influenced by the overall condition of lines. Tree related interruptions are largely due  
11 to trees falling onto lines or branches contacting the lines, and in many cases are due to  
12 adverse weather conditions.

13  
14 Service quality complaints from customers can include concern with momentary outages  
15 (flickering lights), radio and television interference and high neutral voltage (also known  
16 as ‘tingle voltage’ in the farming community).

17  
18 The Trouble Call program also addresses assets in immediate need of repair or  
19 replacement, or encroachment of vegetation that has the potential to cause an outage  
20 within a short period of time. If not attended to, these types of defects may ultimately  
21 result in a power interruption to customers or create a safety hazard to the public or  
22 employees.

23  
24 The majority of trouble calls result in an interruption to customers and power quality  
25 degradation. Service interruptions can impact from one customer to thousands of  
26 customers depending on the severity of the incident and system configuration. Service  
27 restoration requires that the defective component be repaired, temporarily bypassed, or  
28 replaced by crews dispatched to the site at any time, day or night. Defective equipment,

1 if categorized as a capital component, would be replaced under Sustaining Capital as  
2 discussed in Exhibit D1, Tab 3, Schedule 2.

3  
4 This program is reactive in nature and will vary due to external factors such as weather  
5 (e.g. number and severity of storms), variability in equipment deterioration, random  
6 equipment failures, and the volume of customer power quality complaints. Historically,  
7 there have been approximately 50,000 trouble calls responded to annually, of which  
8 roughly one-third are incidents that do not cause a service interruption, but pose a high  
9 risk to the reliability of supply or safety, and need to be addressed in an expedient  
10 manner.

11  
12 Hydro One Distribution must address trouble calls in order to comply with legal and  
13 regulatory requirements to correct known hazardous problems and to maintain safe and  
14 reliable electric service in accordance with good utility practice. Performance on this  
15 program will impact the system reliability service quality indicators specified by the OEB  
16 in the Distributing System Code (Section 7) and in the Electricity Distribution Rate  
17 Handbook, Sections 15.2.1 and 15.2.3.

18  
19 The 2010 and 2011 spending requirements for this program are \$65.3 and \$68.2 million  
20 based on a forecast volume of 49,900 Trouble Calls and an allowance for storm related  
21 costs that are not capitalized (i.e., vegetation management and overtime accumulated  
22 during storm events). This allowance is \$8.0 million in 2010 and \$8.3 million in 2011 to  
23 cover OM&A storm related costs. The proposed spending takes into account observed  
24 historic volumes and historic expenditures for storm response. Trouble Call volumes  
25 have remained relatively steady and storm expenditures have naturally varied from one  
26 year to the next.

27

1 Spending for 2010 and 2011 is forecasted to be below both the 2006 and the 2008 actual  
2 costs. In 2006 and 2008, an unusually high number of damaging storms occurred  
3 resulting in higher storm related costs than normal. This was considered in the  
4 developing the 2010 and 2011 forecasts.

5  
6 Underground Cable Locates

7  
8 This program provides a service of locating and marking Hydro One Distribution  
9 underground plant for customers and contractors who require this information prior to  
10 excavating. This service is provided in accordance with the Electrical Safety Authority's  
11 ("ESA") "Guidelines for Excavating in the Vicinity of Distribution Lines". The program  
12 costs are not recovered through end-user charges in order to encourage property owners  
13 and contractors to make use of this service and avoid hazardous situations that can cause  
14 serious injury. This approach is consistent with the practice followed by other regulated  
15 utilities, including telephone service and natural gas utilities.

16  
17 Program funding is driven by external demand and public awareness. Hydro One  
18 Distribution has seen a continuing trend of increasing numbers of requests and over the  
19 2006 to 2008 period experienced a 13% increase in the number of locates (i.e. 81,975  
20 locates in 2006 to 92,780 locates in 2008). This increase is attributed to continued  
21 emphasis on the "call before you dig" message.

22  
23 Performance on this program was previously tracked by the "Underground Cable  
24 Locates" service quality indicator specified by the OEB in the Electricity Distribution  
25 Rate Handbook, Section 15.1.2. Refer to Exhibit A, Tab 15, Schedule 1 for additional  
26 details.

27  
28 The 2010 and 2011 spending requirements for this program are \$12.8 and \$13.3 million  
29 and are based on an annual forecasted volume of 82,250 cable locate requests. The

1 volume forecast is derived using a 4-year weighted average and is 11% below the 2008  
2 actual volume of 92,780.

3

4 Service Disconnects and Reconnects

5

6 This program funds the provision of service to customers, or their contractors, who  
7 require isolation from the distribution system to facilitate working safely around the  
8 customer-owned portion of a distribution line (e.g. clearing trees and vegetation or  
9 working on customer-owned equipment). When customers complete their work, the  
10 service is reconnected and returned to normal conditions. There is no cost to the  
11 customer for providing this service once per calendar year during normal working hours  
12 in order to encourage customers to maintain their facilities and to work safely.

13

14 Performance on this program contributes to the “Appointments” service quality indicator  
15 specified by the OEB in the Electricity Distribution Rate Handbook, Section 15.1.4.

16

17 The 2010 and 2011 spending requirements for this program are \$8.9 and \$9.3 million to  
18 complete a forecast 11,600 disconnect/reconnect requests. As with cable locate requests  
19 discussed above, disconnect/reconnect requests have increased in volume over the 2006  
20 to 2008 period. The 2008 volume was 11,928 requests, which is 5% above the 2006  
21 volume of 11,413. This increase is attributed to increasing numbers of requests associated  
22 with work on private property and stronger economic conditions during the period. The  
23 2010 and 2011 volumes are forecasted to be below the 2008 highs and are derived using a  
24 4-year weighted average.

25



1 of urban feeders each year to identify defects for corrective action. Those defects  
2 requiring immediate attention are corrected under the trouble call programs as discussed  
3 in Section 2.2.1 of this Schedule and Exhibit D1, Tab 3, Schedule 2 for capital  
4 expenditures. The less serious defects are addressed on a planned basis in the appropriate  
5 time frame.

6  
7 The approach adopted by Hydro One Distribution for line patrols meets the requirements  
8 of the Distribution System Code by combining patrol activities with asset condition  
9 assessment and data collection on assets. Using this integrated approach, Hydro One  
10 Distribution cost-effectively acquires, in one visit, the information needed to effectively  
11 manage the distribution lines system.

12  
13 For overhead lines, patrols also include pole assessments that determine the structural  
14 integrity of Hydro One Distribution's 1.7 million poles. During patrols, poles are always  
15 assessed visually and sounded to identify voids. If there is uncertainty about condition, a  
16 measurement of the remaining sound wood and the degree of internal and external wood  
17 decay is obtained. During the assessment, a pole may be identified to be at end-of-life,  
18 requiring either immediate or future replacement, or given an acceptable rating. In some  
19 cases, follow-up testing may be required to conclusively determine structural integrity.  
20 One such example is the situation that Hydro One Distribution is currently facing with a  
21 subset of its 'Red Pine' poles that have shown premature internal decay and may require  
22 follow-up testing along their entire length. (For details on these poles, please refer to  
23 Asset Condition Assessment Exhibit D1, Tab 2, Schedule 1.) In the end, final assessment  
24 results and other patrol observations are recorded in a database that contains details about  
25 deficiencies and follow-up actions. These details are used to plan future pole  
26 replacements and support decisions on line refurbishment and line upgrades.

1 When patrolling the 120,200 circuit kilometres of overhead and underground lines,  
2 Hydro One Distribution also captures data on the characteristics and conditions of its  
3 lines. For example, the geographic coordinates of all poles are captured, equipment and  
4 line components are identified, conditions are assessed, and all information is recorded in  
5 electronic format and entered into Asset Condition Assessment databases. To accomplish  
6 this, Hydro One Distribution has been averaging data capture at 330,000 pole locations  
7 per year since 2005 and expects to capture data on an additional 360,000 pole locations in  
8 2010. Beyond 2010, the initial lines data collection initiative will be complete. Line  
9 patrol activities starting in 2011 will be leveraged to maintain the data and keep Asset  
10 Condition Assessment databases current. The data collection scope of work was  
11 recognized in both the 2006 and 2008 rates proceedings as an implementation of good  
12 utility practice.

13

14 The data collected on Hydro One Distribution's line assets allows more accurate  
15 identification of the number of wood poles requiring replacement; provides a centralized  
16 repository of line defects that enables more efficient scheduling and bundling of work for  
17 field crews; enables efficient planning for new PCB programs; reduces the time for job  
18 planning and the need for field site visits; and permits easier identification of the work  
19 location through the availability of geographic coordinates. The initiative has also  
20 enabled Hydro One Distribution to begin development of a Distribution Geographic  
21 Information System ("GIS") for broad usage across the corporation.

22

23 Beyond patrols, pole assessments and data collection for overhead and underground lines,  
24 Hydro One Distribution has recently introduced Time-Domain Reflectometry ("TDR")  
25 testing to enhance asset condition assessments for submarine cables. TDR is being  
26 utilized to determine the condition of the armour wire and concentric neutrals of cables,  
27 both of which are prone to corrosion. Additional details on the use of TDR in Asset  
28 Condition Assessment can be found in Exhibit D1, Tab 2, Schedule 1. Submarine cable

1 corrosion typically sets in with age and is prevalent at locations where cables enter and  
2 exit water bodies. Corroded cables present a public safety hazard and require repair or  
3 replacement through a capital trouble call or through planned asset replacements as  
4 discussed in Sustaining Capital Exhibit D1, Tab 3, Schedule 2.

5  
6 Hydro One Distribution's plan is to test 730 of the approximate 5,000 cable installations  
7 in each of 2010 and 2011 at an annual cost of \$2.1 million. Not proceeding with TDR  
8 testing would increase the risk of unsafe submarine cable locations and will lead to public  
9 safety incidents.

10  
11 In total, the 2010 and 2011 spending requirements for Line Patrols, Wood Pole Testing,  
12 and Asset Data Collection is \$17.5 and \$12.2 million respectively. Excluding the \$2.1  
13 million expenditure on new submarine cable testing, the 2010 requirement is similar to  
14 historical and bridge year amounts. The 2010 funding is required to complete the data  
15 collection initiative and to patrol lines and assess poles. In 2011, funding for data  
16 collection is reduced significantly as only data maintenance and updates will be required  
17 going forward, in conjunction with line patrols and pole assessments.

#### 18 19 2.2.2.2 Preventative and Corrective Maintenance

20  
21 Hydro One Distribution's lines preventative maintenance activities include equipment  
22 maintenance that is carried out primarily on a time based schedule and adjusted based on  
23 the PMO approach, described earlier. The lines equipment maintained on a planned basis  
24 includes line reclosers and regulators, three-phase air break and load break switches,  
25 underground and submarine cable terminations, and insulators which are washed to  
26 remove salt accumulation at locations where there has been a history of problems. There  
27 are approximately 17,500 reclosers, 3,500 line regulators, and 1,500 three phase switches  
28 on the lines system. The 2010 and 2011 plan includes annual maintenance of 1,170

1 reclosers, 260 regulators, 160 switches, and washing of insulators on 7,000 structures.  
2 The projected spending for preventative maintenance is \$3.1 million in 2010 and \$3.2  
3 million in 2011.

4  
5 Hydro One Distribution's corrective lines maintenance activities are focused on the repair  
6 and replacement of defective components such as broken guy wires, damaged insulators,  
7 and faulty lightning arresters. Defects typically occur due to normal deterioration brought  
8 on by age and component usage, but in some cases system wide problems with particular  
9 components (e.g. wood pin, EPAC, two piece porcelain) also compel corrective action.  
10 This situation has result in failure rates that exceed what would normally be expected  
11 from the components and require the implementation of work restrictions to address  
12 safety risks. System wide problems as well as all other defective line components are  
13 identified and logged during line patrols. The defects identified are categorized based on  
14 the requirements of the Distribution System Code and corrected in an appropriate time  
15 frame.

16  
17 The 2010 and 2011 spending requirement for defect corrections is \$9.2 million and \$13.1  
18 million respectively. The 2010 requirement is to address approximately 18,500 defects.  
19 In 2011, the plan is to increase this number to 25,000 defects. The increase in 2011  
20 coincides with the completion of the data collection initiative in 2010 and a shift in focus  
21 to addressing the significant number of defects that have been allowed to exist on the  
22 system until such time as complete system data became available.

23  
24 Overall, the 2010 and 2011 spending requirements for the preventative and corrective  
25 maintenance activities are \$12.3 million and \$16.3 million. The 2010 requirement is  
26 consistent with historic amounts and the increase in 2011 is attributed to the increase in  
27 defect corrections.

1 Reduced funding in the preventative maintenance program will reduce the performance  
2 of line protective and isolating equipment needed to minimize customer impacts during  
3 power interruptions. Reductions in the corrective program will increase the failure rate of  
4 equipment and line components, resulting in more frequent outages to customers, a  
5 deteriorating trend in reliability over time and increased safety risks.

6

7 2.2.2.3 Sentinel Lights

8

9 The sentinel light program provides outdoors dusk-to-dawn lighting for rural customers  
10 and has been in existence in Ontario for over 20 years. Hydro One Distribution has a  
11 contractual obligation to honour commitments made by the former Ontario Hydro for  
12 present installations, but no longer accepts requests for new sentinel light installations.

13

14 The current inventory of sentinel lights totals about 38,000 and drives an annual  
15 maintenance program of between 3,000 and 4,000 maintenance responses.

16

17 The 2010 and 2011 spending requirements for this program are \$1.4 million annually.  
18 The forecast is based on historic volumes and recent trends. The projected spending is  
19 comparable to historic years with the exception of 2008 which was considered to be  
20 unusually low.

21

22 Hydro One Distribution is required to honour agreements currently in place and as a  
23 result there is no alternative other than to respond to the maintenance requests.

24

25 2.2.3 PCB Equipment Inspection & Testing and Waste Management

26

27 Activities under this category include the inspection and testing of lines equipment  
28 potentially contaminated with PCB along with the management of wastes generated

1 during the course of maintaining distribution assets. These activities ensure that Hydro  
2 One Distribution operates in an environmentally responsible manner and in compliance  
3 with Federal, Provincial and Municipal regulations.

4  
5 The 2010 and 2011 funding, along with spending levels for the bridge and historic years,  
6 are provided in Table 6 below.

7  
8 **Table 6**  
9 **Waste Management**  
10 **(\$ Millions)**

11

Description	Historic (Actual)			Bridge	Test	
	2006	2007	2008	2009	2010	2011
PCB Lines Equipment Inspection & Testing	-	-	-	2.1	5.5	10.8
Waste Management	3.2	3.1	3.7	3.6	3.9	4.2
<b>Total</b>	<b>3.2</b>	<b>3.1</b>	<b>3.7</b>	<b>5.7</b>	<b>9.4</b>	<b>15.0</b>

12  
13 2.2.3.1 PCB Lines Equipment Inspection & Testing

14  
15 Distribution pole-mounted and pad-mounted transformers manufactured prior to 1985  
16 contain insulating oil that may contain PCB compounds. Prior to September 2008,  
17 regulations placed strict due diligence requirements on situations where PCB's had the  
18 potential to enter the environment or had entered the environment as a result of  
19 transformer failure or oil leakage, but there were no regulations mandating the  
20 elimination of PCB contaminated oil. In September 2008, Environment Canada passed  
21 new PCB Regulations that require the elimination of PCB contaminated oil above 500  
22 ppm in pad-mounted transformers by 2009 and above 50 ppm in lines equipment by  
23 2025.

1 Hydro One Distribution has resumed inspecting and testing lines equipment in response  
2 to the new PCB regulations. Beginning in 2009, the focus was initially placed on pad-  
3 mounted transformers to meet the 2009 requirement. Beyond 2009, the plan is to begin  
4 inspecting and testing pole-mounted transformers and other equipment to meet the 2025  
5 requirement. To accomplish this, the exact location of Hydro One Distribution's 440,000  
6 pole-mounted transformers that were manufactured prior to 1985, and are considered  
7 vulnerable to PCB contamination, will need to be identified. It is estimated this  
8 represents about 240,000 transformers. Inspections will be used to determine these  
9 locations and tests will be undertaken to determine the exact concentrations of PCBs in  
10 the units' insulating oils. Hydro One Distribution's past experience with PCB testing  
11 indicates that approximately 10% of units tested are found to exceed the 50 ppm  
12 threshold and will need to be retired as part of the PCB Equipment Replacement Program  
13 discussed in Sustaining Capital Exhibit D1, Tab 3, Schedule 2.

14  
15 The 2010 and 2011 spending requirements for the PCB Equipment Inspection and  
16 Testing are \$5.5 million and \$10.8 million respectively. These funds will allow for 8,500  
17 inspections and approximately 5,500 tests in 2010 before stepping the program up in a  
18 controlled fashion to achieve 17,000 inspections and approximately 11,000 tests in 2011.  
19 The numbers of inspections and tests proposed for 2011 will need to be maintained  
20 annually leading up to 2025 such that the requirements of the new PCB regulations can  
21 be met.

22  
23 Reduced funding would result in the deferral of a large amount of work until closer to the  
24 2025 deadline and would require even larger annual expenditures in later years along  
25 with significant labour resources to meet the requirements. Proceeding with this work in  
26 a timely and orderly manner is consistent with Hydro One's commitment to  
27 environmental stewardship.

1    2.2.3.2   Waste Management

2

3    Once transformers and other distribution equipment are removed from service, there is a  
4    requirement to manage the solid and liquid waste materials, which includes reporting of  
5    PCB inventories to regulatory authorities, disposal and destruction of these inventories,  
6    disposal of non-contaminated oils, and management and disposal of other wastes. Waste  
7    and PCB management will be an ongoing activity as Hydro One Distribution has 485,000  
8    distribution line transformers and a number of other equipment types that will generate  
9    wastes as they are removed from service. These wastes will need to be managed in an  
10   environmentally approved manner.

11

12   The 2010 and 2011 spending requirements for these activities are \$3.9 million and \$4.2  
13   million respectively. These amounts are slightly greater than historic costs due to  
14   increased demands for waste management as a result of new PCB regulations and greater  
15   volumes of PCB equipment retirements.

16

17   Reduced funding in this program would impact Hydro One Distribution's environmental  
18   stewardship commitment for responsible waste management and hamper the ability to  
19   comply with waste management regulations.

20

21   2.2.4   Other Services

22

23   Lines sustaining OM&A covers a number of miscellaneous services listed in Table 7.

24

**Table 7**  
**Sustaining OM&A – Other Services**  
**(\$ Millions)**

Description	Historic (Actual)			Bridge	Test	
	2006	2007	2008	2009	2010	2011
Customer Inquiries (d)	3.2	3.8	4.4	4.1	4.4	4.5
Investigations & Data Collection (d)	1.0	1.2	0.9	1.0	1.1	1.1
Miscellaneous Services	3.2	6.2	5.4	5.6	7.0	6.9
<b>Total</b>	<b>7.4</b>	<b>11.2</b>	<b>10.7</b>	<b>10.7</b>	<b>12.5</b>	<b>12.5</b>

(d) – indicates this is a demand program

Customer Inquiries provides for the work required to respond to inquiries including those concerning customer services, bills, location of Hydro One Distribution assets on customer properties, planned and unplanned outages, power quality complaints, and clarifications on policies. The number of inquiries can vary from one year the next and has been approximately 8,000 in recent years.

Investigations and Data Collection captures the work required to respond to requests for detailed information on distributing station and line assets. This program addresses information requirements related to specific request for the condition of selected assets, public and employee safety hazards, unacceptable system performance, audit of joint use facilities and data required to support response to customer reliability concerns.

Miscellaneous Services covers a number of activities including: payments to other Local Distribution Companies (“LDCs”) for pole rental where Hydro One Distribution wires are supported by other LDC’s poles; LDC switching requests; funds to collect and report data for a number of service quality indicators to the Ontario Energy Board on an annual basis; miscellaneous engineering and environmental support; and Corporate Environmental Health and Safety activities.

1 Environmental Health and Safety is the largest component of Miscellaneous Services and  
2 makes up approximately 40% of the expenditures. The program ensures a level of due  
3 diligence commensurate with the size and scale of Hydro One Distribution and assists the  
4 company in meeting safety targets. Included in Environmental Health and Safety are  
5 costs for:

- 6 • Occupational and non-occupational injury/illness support which includes medical  
7 assessments of workplace injuries and the Care Management Program which  
8 provides targeted assistance and medical/supervisory support mechanisms for  
9 employees who have experienced long-term absences from work;
- 10 • Hazardous Materials Management which identifies hazardous materials and  
11 establishes a protocol for on-going management of these materials in the  
12 workplace per the Occupational Health and Safety Act and the Workplace  
13 Hazardous Material Information System;
- 14 • School presentations, media campaigns and educational material to inform and  
15 educate members of the public about the hazards of Hydro One's assets;
- 16 • Proactive forums to assist the health and safety of employees by raising awareness  
17 and providing education about health, wellness and lifestyle issues; and
- 18 • A Learning Management System which allows for the development and  
19 administration of all training events in an integrated system.

20  
21 The 2010 and 2011 spending requirements for Other Services are \$12.5 million annually.  
22 The majority of these expenditures are 'demand' driven and are based on historic  
23 customer demands and forecasted workload. These requirements are greater than the  
24 bridge year and the historic average as a result of increases in Health and Safety  
25 programs to support the company's strategic safety goals.

26  
27 The work related to Other Services programs requiring an appointment at a customer's  
28 residence or requiring a written response to a customer inquiry contributes to Hydro One

1 Distribution's performance on the "Appointments" and "Written Response to Inquiries"  
2 service quality indicators specified by the OEB in the Distribution System Code (Section  
3 7) and the Electricity Distribution Rate Handbook, Sections 15.1.4 and 15.1.5,  
4 respectively.

### 5 6 **2.3 Metering**

7  
8 Hydro One Distribution currently owns and maintains revenue meters of three main types  
9 as follows:

- 10
- 11 • Retail Meters
    - 12 ○ Approximately 1.2 million meters measuring energy consumption for
    - 13 residential and other customers whose average monthly demand is 50 kW or
    - 14 less.
    - 15 ○ About 7,300 electronic demand meters for smaller business customers with an
    - 16 average monthly electricity demand of greater than 50 kW.
    - 17 ○ About 1,300 interval meters for existing business customers whose demand
    - 18 exceeds 1,000 kW, recently connected customers whose demand exceeds 200
    - 19 kW and customers below the threshold who have requested interval meters.
  - 20 • Smart Meters – Advanced metering devices and components of a metering system
  - 21 with functionality to bill customers on the basis of Time of Use ("TOU") pricing.
  - 22 These will replace the 1.2 million legacy retail energy meters by 2010.
  - 23 • Wholesale revenue meters used to settle the purchase of energy where the point of
  - 24 supply is directly connected to the IESO-controlled grid. A number of these
  - 25 meters are transitioning from Transmission to Distribution as noted below.

26  
27 OM&A expenditures are required to ensure that metering installations are maintained  
28 properly, replaced when needed and verified in accordance with requirements of the

1 Electricity and Gas Inspection Act (“E&GIA”), Measurement Canada, and the market  
2 rules. In 2010 and 2011 metering sustaining OM&A expenditures include the costs  
3 associated with operating and maintaining the smart meters installed to the end of 2008,  
4 as discussed later in this Schedule.

5  
6 The funding for distribution revenue metering for the 2010 and 2011 test years, and  
7 spending levels for the bridge and historic years, is provided in Table 8 below.

8  
9 **Table 8**  
10 **Metering OM&A**  
11 **(\$ Millions)**  
12

Description	Historic (Actual)			Bridge	Test	
	2006	2007	2008	2009	2010	2011
Customer Retail Meters	8.1	8.5	5.6	4.8	4.9	6.2
Smart Meters	-	-	-	-	6.7	6.9
Wholesale Revenue Meters	1.0	1.0	1.6	1.8	1.9	2.1
Telecom & Control	-	-	-	1.8	1.4	1.6
<b>Total</b>	<b>9.1</b>	<b>9.5</b>	<b>7.2</b>	<b>8.4</b>	<b>14.9</b>	<b>16.8</b>

13  
14 **2.3.1 Customer Retail Revenue Meters**

15  
16 Of Hydro One Distribution's existing 1.2 million retail meters, about 500 must be  
17 removed and replaced each year due to random failures, damage or obsolescence. In  
18 addition, under the E&GIA and regulations, all revenue meters must be routinely  
19 inspected, maintained and their accuracy verified by an accredited meter verifier. Typical  
20 verifications involve the testing of a statistically derived sample group of meters,  
21 according to a sampling program monitored and regulated by Measurement Canada.  
22 Normally the samples pass, but a failure of a sample group entails replacement of all  
23 meters in that group.

1 Meters that do not qualify to be sampled, such as commercial or industrial meters, require  
2 all seal meters to be verified.

3  
4 To avoid inefficiencies which would result from the testing and verification of installed  
5 meters, followed by their near term replacement by smart meters, Hydro One Distribution  
6 received a dispensation in 2006 from Measurement Canada which allows meters coming  
7 due for verification from 2008 through 2010 to remain in place without verification. This  
8 dispensation has applied only to meters that have been demonstrated to retain a high level  
9 of accuracy, comprising about 75% of the sample group population. As a result of this  
10 dispensation, costs associated with maintaining retail revenue meters have been lower  
11 during the years leading up to 2011.

12  
13 For its demand and interval-metered customers, Hydro One Distribution is currently  
14 examining smart meter options with appropriate communication platforms and once these  
15 are determined, will develop and implement smart metering plans. The current meters,  
16 however, will continue to need expenditures focused on routine maintenance, re-sealing,  
17 verification, trouble calls and other sustaining activities.

18  
19 In addition to ongoing tests and verifications of meters that are not impacted by smart  
20 meter installations, Hydro One Distribution will begin testing and verifying samples of  
21 smart meters in 2011. The smart meters that will be targeted and sampled are those that  
22 were installed in 2006 and will have been in-service for 5 years. Their sampling will  
23 make up Hydro One Distribution's first experience with routine verifications for smart  
24 meters and are considered necessary to detect potential issues with the large number of  
25 smart meters that have or will be deployed.

26  
27 The 2010 and 2011 spending requirements for this program are \$4.9 million and \$6.2  
28 million respectively, which are below the historic average. This funding level is based on

1 an assessment of historic costs and projected meter verifications, while accounting for  
2 savings from reduced meter testing and replacement due to the Measurement Canada  
3 dispensation.

#### 4 5 2.3.2 Smart Meters

6  
7 On page 20 of its Decision on Hydro One Distribution's 2008 rate application proceeding  
8 EB-2007-0681, the Board approved the inclusion of all "minimum functionality" and  
9 "beyond minimum functionality" smart meters installed to December 31, 2007 in rate  
10 base. In this Application, Hydro One Distribution is requesting the Board approve the  
11 disposition and inclusion in rate base of all smart meters installed to December 31, 2008,  
12 as described in Exhibit F1, Tab 1, Schedule 1. Accordingly, the costs associated with the  
13 maintenance and operation of those meters to be included in rate base are part of Hydro  
14 One Distribution's OM&A expenditures. The OM&A costs in this period cover the work  
15 needed to operate the data collection network (i.e. meters, repeaters, collectors) and  
16 deliver the necessary meter data to the meter data repository ("MDM/R"). Costs also  
17 include payments for software license and maintenance fees, Bell/Rogers  
18 communications fees and CIS maintenance costs.

19  
20 The 2010 and 2011 spending requirements for this new program are \$6.7 million and  
21 \$6.9 million respectively.

#### 22 23 2.3.3 Wholesale Revenue Meters

24  
25 Since 2003, in accordance with market rules, accountability for legacy wholesale revenue  
26 meters ("WRMs") owned by Hydro One Transmission, but used to settle Hydro One  
27 Distribution purchases from the IESO-administered market, have been transitioning to

1 Hydro One Distribution. By the end of 2008, Hydro One Distribution has assumed  
2 accountability for 360 WRMs.

3  
4 As Hydro One Distribution is an IESO-registered meter service provider, it will provide  
5 all servicing for its WRMs (i.e. preventative maintenance, meter re-sealing and  
6 verification, response to problems, corrective services and IESO registration). Funding  
7 for this program includes these services and is required to ensure accurate wholesale  
8 billing by the IESO, and to comply with the market rules and Measurement Canada  
9 regulations.

10  
11 The 2010 and 2011 spending requirements for this program are \$1.9 million and \$2.1  
12 million respectively. These figures are based on known costs and volumes and are  
13 increasing relative to historic expenditures to reflect the gradual increase in the number of  
14 meters to be maintained due to the transition of the WRMs from Hydro One  
15 Transmission to Distribution as required by the market rules.

#### 16 17 2.3.4 Telecom, Monitoring and Control

18  
19 Telecom costs for the remote interrogation of retail Smart Meters is funded from the  
20 Smart Meter Program. There are about 400 legacy meters which are classified as Meter  
21 Inside Settlement Timeframe (“MIST”). Measurement Canada regulations and IESO  
22 Market Rules require hourly readings from MIST meters and the only cost effective way  
23 to manage this is by automated interrogation using a telecommunication link to the meter.

24  
25 In addition to telecommunication needs associated with MIST meters, Hydro One  
26 Distribution’s has telecommunication needs associated with sectionalizing switches with  
27 remote control on some feeders, and monitoring and control at some Distribution

1 Stations. The installation of additional monitoring and control will continue to increase  
2 the need for telecommunications.

3  
4 The 2010 and 2011 spending requirements for Telecom and Control are \$1.4 million and  
5 \$1.6 million respectively. In historic years, costs were included in Retail and Wholesale  
6 Revenue Meter costs discussed above. Costs have been increasing as a result of  
7 additional distribution and equipment monitoring and control needs and increases in the  
8 number of MIST meters. Going forward, Hydro One Distribution has decided to  
9 separately track these costs given the additional telecommunications needs that are  
10 arising, and will grow in future years, associated with smart meter communications,  
11 distributed generation enablement initiatives, and the implementation of the smart grid.

12  
13 Hydro One has also seen an increase in telecommunications associated with Hydro One  
14 Distribution's program to put sectionalizing switches with remote control on some  
15 feeders and to install monitoring and control at some Distribution Stations.

16  
17 The increases in 2010 and 2011 of \$1.2 million and \$1.3 million, respectively, are  
18 attributed to the increase in the number of MIST meters and the telecom monitoring of  
19 additional distribution equipment.

## 20 21 **2.4 Vegetation Management**

22  
23 The Vegetation Management program manages clearances to energized equipment to  
24 maintain an acceptable and sustainable level of reliability; manage safety hazards posed  
25 by trees in proximity to energized lines, manage plant species on the right of way floor to  
26 permit worker access for maintenance and restoration of power, and minimize  
27 environmental, ecological and social impacts.

1 There are approximately 102,000 km of lines on rights-of-way, with most requiring tree  
 2 trimming or removal, and brush (undergrowth) control. Tree growing conditions vary  
 3 throughout Ontario, which contains three forestry zones. The predominant region is the  
 4 temperate hardwood forests which includes areas of the south, east and as far north as  
 5 Wawa & New Liskeard. The other two regions include the deciduous forests of  
 6 southwestern Ontario and the boreal forests of parts of northern Ontario. Tree species  
 7 indigenous to the southern part of the province, and better growing conditions usually  
 8 results in more frequent maintenance cycles in the south than in the north.

9  
 10 Vegetation management activities include line clearing comprising of tree removal and  
 11 trimming, brush control, customer notification, vegetation asset condition assessment,  
 12 and unplanned maintenance in response to reliability and customer issues as required.  
 13 The annual program is compiled using the following inputs: vegetation condition data,  
 14 tree clearances to energized facilities, recent reliability data, and issues identified by  
 15 customers.

16  
 17 Vegetation Management work is divided into 5 programs with proposed funding for 2010  
 18 and 2011 along with spending levels for the bridge and historic years provided in Table 9  
 19 below.

20  
 21 **Table 9**  
 22 **Vegetation Management**  
 23 **(\$ Millions)**

Description	Historic (Actual)			Bridge	Test	
	2006	2007	2008	2009	2010	2011
Unplanned Maintenance (d)	6.1	6.9	7.1	7.2	7.3	7.5
Customer Notification	6.8	6.5	6.1	8.4	7.8	8.5
Asset Condition Assessment	0.5	0.5	0.5	0.9	0.8	0.8
Line Clearing	50.6	74.1	78.7	88.3	84.0	91.6
Brush Control	25.2	26.9	25.8	31.3	33.3	36.2
<b>Total</b>	<b>89.1</b>	<b>115.0</b>	<b>118.2</b>	<b>136.1</b>	<b>133.2</b>	<b>144.6</b>

24 (d) – indicates this is a demand program

1 The 2010 and 2011 spending requirements are based on continuing to reduce the  
 2 vegetation management cycle such that the implementation of a 7-year cycle can begin in  
 3 2011. This proposal follows two years (i.e. 2007 and 2008) of line clearing  
 4 accomplishments at about an 8-year cycle. To reduce the cycle further will require a 14%  
 5 increase in expenditures in 2010 and a 24% increase in 2011 in comparison to the 2007  
 6 and 2008 period. The reduction of the cycle and the need to increase expenditures to  
 7 achieve this was initially discussed during Hydro One Distribution's 2006 rates  
 8 application (EB-2005-0378) and explored in detail during the 2008 Distribution rate  
 9 proceeding (EB-2007-0681).

10

11 One of the drivers for continuing to reduce the clearing cycle is improvement to system  
 12 reliability. As noted in Section 6 of Exhibit A, Tab 4, Schedule 1, tree-related contacts  
 13 accounted for 57% of SAIDI and 29% of SAIFI between 2005 and 2008 and the negative  
 14 impact of trees during storm events is especially acute as trees accounted for 77% of  
 15 SAIDI and 57% of SAIFI during force majeure events. The impact that vegetation has  
 16 had during historic years can be seen in Table 10 below.

17

18

19

20

**Table 10**  
**Total SAIDI and Vegetation Contribution**

Year	All Interruptions (hrs)			Force Majeure Events (hrs)		
	Total	Tree Contribution	Tree %	Total	Tree Contribution	Tree %
2006	28.4	18.1	64%	21.3	16.2	76%
2007	11.4	3.9	34%	2.7	1.3	49%
2008	21.6	13.8	64%	13.0	10.7	83%
<b>Total</b>	<b>61.4</b>	<b>35.8</b>	<b>58%</b>	<b>36.9</b>	<b>28.3</b>	<b>77%</b>

21

22 Vegetation Management is the single largest program managed by Hydro One  
 23 Distribution and has great potential to impact system reliability. Experience has shown  
 24 that when an average feeder with 7 years of growth is cleared, the improvement in  
 25 reliability during the first year after clearing is:

- SAIFI – 21% during non-storms and 49% during force majeure events
- SAIDI – 21% during non-storms and 54% during force majeure events

If that feeder is not cleared at the 7 year mark, then reliability deteriorates as shown in Table 11 below.

**Table 11**  
**Deterioration in Reliability Relative to the 7-Year Clearing Mark**

Marker	Non-Storm Events		Force Majeure Events	
	SAIDI	SAIFI	SAIDI	SAIFI
8 Years	4%	4%	12%	11%
9 Years	7%	8%	23%	20%
10 Years	11%	11%	32%	29%

This information confirms that more frequent maintenance yields significant reliability benefits.

In addition to the reliability improvements, analysis such as the Vegetation Management Program Review filed as an attachment to Exhibit H, Tab 1, Schedule 14 in EB-2007-0681 has shown that a shorter cycle is more cost effective as more frequent maintenance results in reduced workload on a per kilometre basis and lower unit costs. Currently, Hydro One Distribution is only a quarter of the way (i.e. 2 years) into implementing an 8-year cycle and has been working to address maintenance backlogs associated with lower levels of accomplishments earlier in the decade. As the implementation progresses further, it is expected that experience will confirm that a shorter cycle is more cost effective. To ensure that the implementation does not result in unnecessary costs, a shorter cycle has been introduced in a gradual manner that takes into account the availability of resources. During the past two years, Hydro One Distribution has prudently built its resource capability by continuing to hire forestry apprentices while at the same time contracting out line clearing work that could not be resourced by internal staff. To cost effectively contract work, the corporation's forestry organization has also

1 developed skills in contract management, monitoring, work packaging, and quality  
2 control.

3  
4 To continue to reap reliability benefits and improve the cost effectiveness of the its  
5 Vegetation Management Program, Hydro One Distribution is proposing to gradually  
6 increase line clearing and brush control accomplishments to 13,500 km in 2010 and  
7 14,300 km in 2011, which is the level of accomplishment that must be maintained to  
8 achieve a 7 year cycle.

9  
10 Details concerning each of the components that make up the vegetation management  
11 program are discussed in the sections below and additional information on vegetation  
12 management is also provided as part of the ACA discussion in Exhibit D1, Tab 2,  
13 Schedule 1.

#### 14 15 2.4.1 Unplanned Vegetation Management

16  
17 All of the 102,000 km of rights of way is situated in the public domain and the  
18 management of vegetation on and adjacent to the rights of way is of interest to many of  
19 the 1.2 million Hydro One Distribution customers, property owners, municipalities, and  
20 government ministries. Each year these groups identify vegetation issues that need to be  
21 addressed during the current year in order to ensure customer reliability and public safety.  
22 Unplanned work initiated by the public includes the removal of hazard trees that may fall  
23 into a line and restoring clearances to energized equipment at locations that are not within  
24 the current year's planned program.

25  
26 In addition to issues raised by external stakeholders, a number of the reliability and safety  
27 issues are identified by Hydro One Distribution staff each year. These issues may be  
28 identified through line patrol observations, vegetation asset condition assessments,

1 routine trouble call response, or reliability monitoring. Once identified, issues are  
2 addressed during the current year in an off-cycle manner.

3  
4 One particular issue that has arisen in recent years and that is expected to place upward  
5 pressure on unplanned expenditures over the longer term is the presence of the Emerald  
6 Ash Borer (“EAB”) in Ontario. The EAB is a shiny green beetle native to Asia that was  
7 accidentally introduced to North America and first detected in Michigan in 2002. It has  
8 since spread into Ontario, laying eggs into ash tree bark and causing tree death within two  
9 years. To date the EAB has predominantly impacted the south west portion (i.e. Essex,  
10 Kent, Lambton) of the Province but it has been detected as far north as Sault Ste. Marie.  
11 The rate at which ash trees die after exposure to the EAB is alarming as dead trees  
12 threaten adjacent power lines causing reliability and safety risks. Hydro One Distribution  
13 relies on off-cycle vegetation maintenance to address this risk as well as other unplanned  
14 issues requiring short-term attention.

15  
16 The 2010 and 2011 spending requirements for this program are \$7.3 and \$7.5 million  
17 respectively. These amounts are based on historic expenditures. A reduction in these  
18 expenditures would result in specifically identified customer, reliability, and safety issues  
19 going unaddressed.

#### 20 21 2.4.2 Customer Notification

22  
23 Prior to commencement of line clearing and brush control, customer approval is acquired  
24 to gain access onto private property and to resolve issues concerning tree removal,  
25 trimming and control of brush, as well as obtain input from customers concerning any  
26 property restrictions and environment concerns. During this phase of the work, job  
27 planning and project layouts are completed, a detail scope of work is prepared and  
28 approvals are obtained from groups such as property owners, Municipalities, and the

1 Ministry of Natural Resources as required. These planning and project management  
2 activities are essential for Hydro One Distribution to complete its annual vegetation  
3 management work programs (i.e. line clearing and brush control) with minimum  
4 disruptions, and to manage customer and property owner concerns in a responsible and  
5 proactive manner.

6  
7 The 2010 and 2011 spending requirement for this program is \$7.8 and \$8.5 million.  
8 These amounts are greater than historic expenditures due to the need to conduct greater  
9 numbers of notifications in preparation for increases in line clearing and brush control.

10  
11 Reductions in this program will see an increase in customer complaints, incomplete  
12 approvals to enter properties to carry out work, and expected disruptions to planned work  
13 as a result of property owner intervention. As well, with disruptions in the flow of  
14 planned work, one can expect unit costs to increase with the larger line clearing and brush  
15 control programs.

#### 16 17 2.4.3 Asset Condition Assessment

18  
19 Asset condition assessment is an integral aspect of the asset management approach and is  
20 generally completed about 2 years prior to the time projected for line clearing.  
21 Information obtained includes vegetation height, tree and brush densities and clearances  
22 to conductors, and this information is then used to prioritize and schedule work. For  
23 further details concerning the condition of vegetation on Hydro One Distribution's rights  
24 of way refer to Exhibit D1, Tab 2, Schedule 1.

25  
26 The 2010 and 2011 spending requirements are \$0.8 million annually. The increase over  
27 historic expenditures is attributed to the need to increase accomplishments such that  
28 current condition information is available at the time of scheduling line clearing and

1 brush control. Like Customer Notification, the increased accomplishments are driven by  
2 more frequent vegetation maintenance and a shorter cycle.

3  
4 Reductions in this program will result in planning and scheduling inefficiencies that will  
5 reduce the effectiveness of the larger brush control and line clearing programs.

6  
7 2.4.4 Line Clearing.

8  
9 Line clearing includes:

- 10 1) Removal of damaged or diseased trees along the edge of and on the rights-of-way  
11 that pose a threat of falling into a line;  
12 2) Tree trimming required to maintain clearances to energized facilities, thereby  
13 reducing the likelihood of power interruptions.

14  
15 On average there are more than 50 trees per kilometer that need to be removed or  
16 trimmed on the distribution system, and during 2008 Hydro One Distribution removed or  
17 trimmed approximately 700,000 trees in total. This program maintains tree clearances  
18 and reduces risks of danger trees, and as such has a great potential to improve reliability.

19  
20 For 2010, Hydro One Distribution is proposing an accomplishment of 13,500 km, which  
21 is to be increased to 14,300 km in 2011. 14,300 kilometres represents the annual  
22 accomplishment level necessary to achieve a 7-year vegetation maintenance cycle and is  
23 aligned with Hydro One Distribution's strategy of improving the reliability of the  
24 distribution system under both normal conditions and during storm events.

25  
26 As detailed at the beginning of this section, the impact of trees on Hydro One  
27 Distribution's system is significant. The planned 35% increase in the volume of work  
28 will target the rights-of-way contributing most to unreliability on Hydro One

1 Distribution's system, and should make appreciable improvements over time to the  
2 benefit of all customers. Hydro One believes its plan demonstrates good utility practice,  
3 addresses customer reliability, mitigates safety risks, and over the long term will reduce  
4 unit costs. Hydro One Distribution will continue to monitor the performance of the  
5 distribution system along with the performance of the Vegetation Management Program  
6 and will continue to assess the need for further program improvements and cycle  
7 adjustments. This topic is further discussed as part of the ACA in Exhibit D1, Tab 2,  
8 Schedule 1.

9  
10 The 2010 and 2011 spending requirements for the line clearing activity are \$84.0 and  
11 \$91.6 million respectively. The increase over recent historic years (i.e. 2007 and 2008) is  
12 attributed to an 11% increase in accomplishments in 2010 and a 17% increase in 2011  
13 with reference to same historic time frame.

14  
15 Reduced funding for line clearing will impede reliability improvement progress and will  
16 perpetuate the current situation of highly variable reliability performance. Furthermore,  
17 the system will remain very vulnerable to tree storm damage in the short term.  
18 Reductions in this program will also increase the life cycle costs for vegetation  
19 management and thereby create future inefficiencies.

#### 20 21 2.4.5 Brush Control

22  
23 Brush control involves the management of specific plant types on the right-of-way floor  
24 to minimize the presence of trees that can grow tall enough to contact the overhead lines.  
25 This program also provides a right-of-way that will facilitate access of equipment,  
26 inspection and maintenance activities, and emergency response.

1 Costs to control brush increases significantly once the brush height exceeds 3 meters and  
2 can more than double in cost if the brush is allowed to grow within the electrical limits of  
3 approach. Mechanical brush control methods and the requirement to use work  
4 procedures to ensure worker safety are the primary reason for the increase in cost. These  
5 methods are increasingly required as a result of community resistance to herbicide use.  
6 The level of accomplishment proposed for 2010 and 2011 is the same as for line clearing  
7 and involves clearing brush on 13,500 km of rights-of-way in 2010 and 14,300 km.

8

9 The 2010 and 2011 spending requirements for this activity is \$33.3 and \$36.2 million  
10 respectively. These expenditures are greater than historic expenditures during the 2007  
11 and 2008 period and are attributed to accomplishment increases of 25% and 32% over  
12 those years.

13

14 Reduced funding in this program will increase unit cost for brush control and the overall  
15 life cycle cost. Reduced brush control also makes it more difficult to access the rights-of-  
16 way, which hampers emergency restoration and consequently increases outage durations.