



1 a key success factor for its future that allows it to find better ways to meet customer  
2 needs.

3

4 Customers expect and deserve reliable power at reasonable rates. Hydro One  
5 Distribution's strategy and business plan must ensure rates that can finance needed  
6 investment in infrastructure while maintaining affordable and reliable service. While  
7 customer satisfaction with the Company's performance remains strong, customers face a  
8 growing array of changes and challenges, and they increasingly look to Hydro One  
9 Distribution help them manage their use of power, maintain high levels of service  
10 reliability and keep prices reasonable. With the introduction of smart meters and the  
11 upward pressure on electricity prices in the coming years, Hydro One Distribution will  
12 face increasing demands from its customers. The Company is prepared to meet their  
13 expectations.

14

## 15 **1.2 Strategic Goals and Performance Targets**

16

17 The company's strategic objectives commit it to:

- 18 • Creating an injury-free workplace and maintaining public safety.
- 19 • Satisfying our customers' needs for affordable, reliable power.
- 20 • Focusing on continuous innovation to ensure a modern, flexible and smart  
21 electricity grid capable of delivering new, clean power.
- 22 • Building and maintaining reliable and cost effective transmission and distribution  
23 systems.
- 24 • Protecting and sustaining the environment for future generations.
- 25 • Developing critical skills and knowledge retention in the face of demographic  
26 change.
- 27 • Achieving productivity improvements and cost effectiveness.

- Maintaining a commercial culture that increases value for our shareholder while achieving the commitments above.

These strategic objectives do not stand alone and are inextricably linked. They drive the fulfillment of the Company’s mandate and the achievement of its vision, which is:

*“Hydro One will be the leading electricity delivery company in North America“.*

The company will operate with clear operational and financial performance targets. Where data is available, Hydro One will benchmark its performance against that of other North American utilities and will put plans and programs in place to achieve our vision of being the leading delivery company in North America. The five-year goals associated with the company’s strategic objectives are shown in Table 1.

**Table 1**

<b>STRATEGIC OBJECTIVES</b>	<b>FIVE-YEAR VISION</b>
Injury-Free Workplace	Achieve zero lost-time injuries
Satisfying Our Customers	90% Customer Satisfaction
Continuous Innovation	Develop and meet Smart Grid goals
Reliable, Distribution Systems	Achieve top-quartile distribution reliability (like with like)
Protecting the Environment	Reduce our environmental footprint through oil spill management and greenhouse gas reduction
Recruitment Knowledge Transfer	Achieve and maintain top-quartile employee engagement
Shareholder Value	Achieve the ROE allowed by the Ontario Energy Board and maintain “A” credit rating category
Productivity	Achieve top-quartile unit costs in Distribution

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The strategic objectives identified in Table 1 underpin and drive the Company's business planning process and all of its activities going forward.

## **2.0 SYSTEM BACKGROUND**

The Hydro One Distribution system has evolved over almost 100 years. At Dec. 31, 2008, Hydro One Distribution managed \$4.1 billion in fixed assets supplying electricity to customers across the province of Ontario. The assets consist of about 120,200 circuit kilometers of distribution line and 1005 distributing and regulating stations. The system delivers electricity at voltages below 50 kV from Ontario's transmission and generation systems to 32 Local Distribution Companies, approximately 1.2 million Retail Customers and 47 directly connected large users (> 5MW). The system is also likely to be used increasingly to serve distributed generators. As of the first quarter of 2009, the Ontario Power Authority's ("OPA's") Renewable Energy Standard Offer Program had resulted in about 2,300 projects exploring the feasibility of developing new renewable generation up to 10 MW connecting to Hydro One's distribution system. It is expected that many of these will go forward and connect to the system.

The Hydro One Distribution system is mainly radial in design, with very little redundancy in supply to customers, which is consistent with other rural systems. Because of this configuration, most component failures require immediate repair to restore service. To effectively manage the response to trouble calls from customers, initial problem assessment and dispatching of a response is handled through the single Ontario Grid Control Centre ("OGCC").

1 The Hydro One Distribution system typically operates in a service territory characterized  
2 by low customer densities. To cost-effectively provide operating, maintenance and  
3 restoration services there are a number of Service Centers located throughout the  
4 Province. These Service Centers provide base locations for field crews and related  
5 materials, tools and equipment.

### 6 7 **3.0 DISTRIBUTION SYSTEM COMPONENTS**

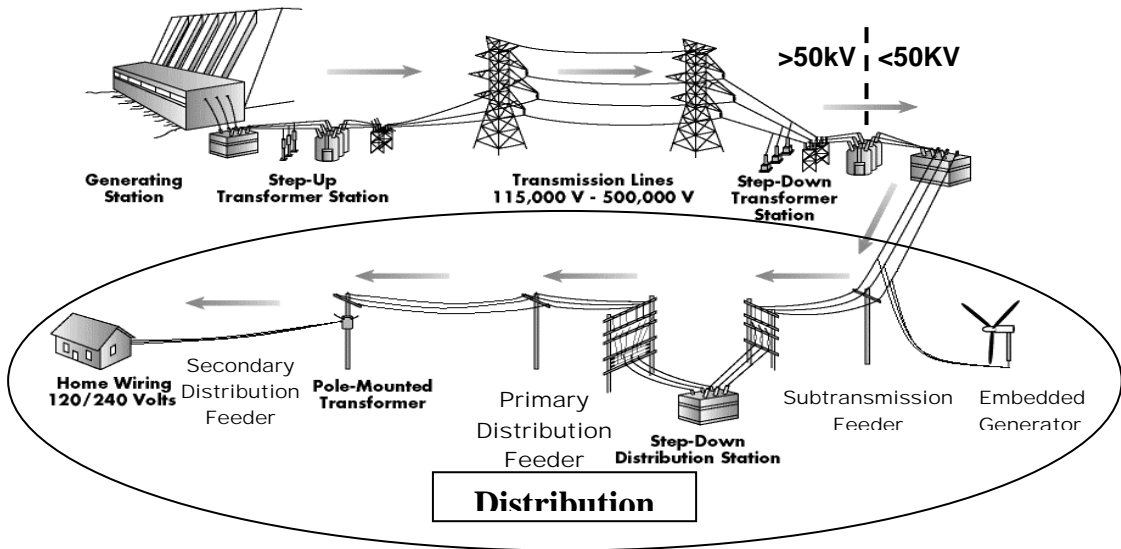
8  
9 The Hydro One Distribution system receives wholesale electricity from the transmission  
10 system and delivers it to consumers at lower voltages through a series of radial assets. It  
11 is also used to take electricity from smaller distributed generators connected directly to  
12 the distribution system, or connected to load customer systems which are connected to  
13 the distribution system. The system consists primarily of the following assets:

- 14
- 15 • Subtransmission feeders
  - 16 • Distribution Stations
  - 17 • Primary Distribution Feeders
  - 18 • Pole top and pad mounted transformers
  - 19 • Secondary distribution feeder
- 20

21 Figure 1 provides a simplified illustration of Hydro One Networks' distribution system.  
22

Figure 1: Hydro One Networks' Distribution System <sup>1</sup>

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### 3.1 Subtransmission Feeders

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Hydro One's 24,700 circuit kilometers of subtransmission feeders predominately originate at transmission transformer stations and in some cases at distribution stations and provide a link between Hydro One Networks' system and large distribution connected customers, (e.g. generators, distribution LDCs) and other end use customers. Typically, subtransmission feeders supply service at 44 kV, 27.6 kV, 25 kV, 22 kV and 13.8 kV directly to end-use customers or deliver service to distribution stations owned by either LDCs or Hydro One Distribution where further voltage transformation takes place.

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14

In some cases, regulating stations are used to maintain subtransmission feeder voltages within the prescribed limits. This is needed because the line voltage increases or

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<sup>1</sup> For illustrative purposes only, actual configuration may vary from case to case.

1 decreases depending on the loading variations at the distribution stations supplied by the  
2 sub-transmission feeders.

### 3 4 **3.2 Distribution Stations**

5  
6 Distribution stations step down voltage from transmission or sub-transmission levels to  
7 primary distribution voltage for distribution to commercial, industrial, farm, year-round  
8 residential and seasonal residential customers. In future, where the output of distributed  
9 generation served from a distribution station exceeds the demand of load customers  
10 served by that station, the distribution station will also be required to step up voltages as  
11 the flow reverses from the normal direction of serving load.

12  
13 Distribution stations typically consist of one or two transformers, depending on the load  
14 that needs to be supplied. A loss of any one element (such as a transformer or a feeder) at  
15 a distribution station will normally result in the interruption of service to all customers  
16 served from that station until the failed component is repaired or replaced, or until an  
17 alternate service is enabled.

### 18 19 **3.3 Primary Distribution Feeders**

20  
21 Hydro One Distribution has 95,500 circuit kilometers of primary distribution feeders  
22 operating from 4 kV to 13.8 kV. These feeders are radial circuits that deliver power from  
23 distribution stations to individual customers via pole top and pad mounted transformers  
24 and include overhead circuits, underground cables and submarine cables. These feeders  
25 are also likely to be used to serve increasing numbers of smaller new generators in future.

26

1     **3.4     Pole Top and Pad Mounted Transformers**

2  
3     Hydro One Distribution's 440,000 pole top transformers are used to step down primary  
4     distribution voltages to secondary voltage level, the voltage level used by residential and  
5     small commercial customers. Hydro One's system also has 45,000 pad mounted  
6     transformers which perform the same function when power is supplied by underground  
7     feeders.

8  
9     Depending on the proximity of adjacent customers, each single-phase pole top or pad  
10     mounted transformer may supply several customers at 240/120 volts whereas a three-  
11     phase pole top or pad mounted transformer supplies a single customer at 600/347 volts or  
12     208/120 volts.

13  
14     **3.5     Secondary Distribution Feeders**

15  
16     Hydro One Distribution's system has approximately 49,000 kilometers of secondary  
17     distribution feeders connect pole top or pad mounted transformers with individual  
18     customers at the secondary voltage levels described in the previous section. These feeders  
19     could be either underground or overhead when originating from a pole top transformer  
20     and underground only when originating from a pad mounted transformer.

21  
22     **4.0     WORK PLANNING AND SYSTEM OPERATIONS**

23  
24     Hydro One Distribution's investment needs are determined as part of the corporate  
25     business planning process discussed in Exhibit A, Tab 14, Schedule 1. Individual  
26     investments are developed taking into account various factors such as asset condition  
27     assessment studies, historical performance data, asset criticality, availability of spare  
28     equipment and material, asset demographics, load growth and future capacity

1 requirements using the process described in Exhibit A, Tab 14, Schedule 5. Individual  
2 investments are submitted for further evaluation against all other investments proposed  
3 by the Company using the prioritization approach described in Exhibit A, Tab 14,  
4 Schedule 6.

5  
6 The annual work plan is broadly grouped into Sustaining, Development and Operations  
7 categories, as further described below.

#### 8 9 **4.1 Sustaining**

10  
11 Asset sustaining work is defined as the work required to maintain existing infrastructure  
12 and facilities such that they operate at their required performance level. Hydro One  
13 Distribution plans and executes asset sustainment work to maintain customer delivery  
14 reliability system-wide while meeting applicable legislative, regulatory, safety and  
15 environmental requirements. The capital component of sustaining work deals primarily  
16 with refurbishment or replacement of end of life components or systems. The OM&A  
17 component of sustaining work addresses preventive and breakdown (corrective)  
18 maintenance within the useful life span of the asset.

19  
20 The Sustainment OM&A and Capital components of the investment plan are described in  
21 Exhibit C1, Tab 2, Schedule 2 and Exhibit D1, Tab 3, Schedule 2 respectively.

#### 22 23 **4.2 Development**

24  
25 Hydro One Distribution plans and executes development work on the distribution system  
26 to connect new load customers and generators, and to ensure that the system has  
27 sufficient capability to supply existing and forecast loads. Included in the Development  
28 category is work to improve the reliability of service to customers, ensure that service is

1 within acceptable utility standards, and in some cases mitigate risks associated with  
2 deteriorated assets, where a different network configuration is preferable to like-for-like  
3 asset replacement. The work is largely driven by load and generator customer demand  
4 and involves both short-term and long-term system reinforcement projects. Funding  
5 levels are based on meeting requirements of the Distribution System Code and Hydro  
6 One Distribution's Conditions of Service, and addressing the most critical system  
7 reinforcement needs.

8  
9 The Development OM&A and Capital components of the investment plan are described  
10 in Exhibit C1, Tab 2, Schedule 3 and Exhibit D1, Tab 3, Schedule 3 respectively.

### 11 12 **4.3 Operations**

13  
14 The Operations category primarily includes work to operate the distribution system on a  
15 day-to-day basis. As noted above, the distribution system is operated through a  
16 combination of central control and dispatch via the OGCC, and local response by field  
17 crews operating from service centers across Hydro One Distribution's service territory.  
18 This approach allows for efficient problem-identification and dispatch of personnel as  
19 well as timely customer notification. Currently the Hydro One Distribution system relies  
20 on power-off calls by customers to identify interruptions except at locations where a sub-  
21 transmission feeder originates at a transformer station. Real time monitoring exists at  
22 these transformer stations, but not on other locations on the distribution system, however  
23 this is changing with the introduction of Smart Meters. The operating environment is  
24 also evolving quickly due to the impact of Smart Grid and Distributed Generation.

25  
26 The Hydro One Distribution system covers an extensive geographic area and its customer  
27 base is both urban and rural resulting in large density differences. The company's  
28 response capability is dependent on service center location, fault location and terrain. In  
29 general, high-density areas are served within 2 hours and in rural areas response times

1 can be up to 4 hours due to travel requirements. This scale and diversity in the  
2 distribution system has a direct impact on Hydro One Distribution's costs and system-  
3 average interruption measures for both frequency and duration.

4  
5 The Operations OM&A and Capital components of the investment plan are described in  
6 Exhibit C1, Tab 2, Schedule 4 and Exhibit D1, Tab 3, Schedule 4,

7  
8 **5.0 ASSET MANAGEMENT MODEL**

9  
10 Hydro One has adopted an Asset Management model in designing the processes used to  
11 plan, approve and implement work. The key principles include having functions primarily  
12 responsible for defining the work requirements (Asset Management functions) and  
13 functions primarily responsible for delivering asset and customer based services in  
14 accordance with the defined work (Work Execution functions). Primary responsibility for  
15 planning and decision making associated with the management of distribution assets falls  
16 under the Asset Management functions, whereas primary responsibility for providing  
17 engineering, design, estimating, construction, maintenance, operating, and customer care  
18 services falls under the Work Execution functions.

19  
20 Both components of the business actively participate in all phases of work planning and  
21 implementation. However, the focus created by this approach allows Hydro One  
22 Distribution to better create the competencies and cost-efficiencies to effectively plan and  
23 implement the work.

1 **5.1 Asset Management Functions**

2  
3 Hydro One manages its distribution assets using two main processes, Strategy  
4 Development and System Investment.

5  
6 **5.1.1 Strategy Development**

7  
8 The Strategy Development function provides a managed approach for developing  
9 strategies, policies, and standards associated with the operation, maintenance and  
10 expansion of the distribution system. This function is specifically responsible for  
11 designing programs to:

- 12
- 13 • Ensure compliance with regulatory requirements;
  - 14 • Achieve business objectives such as public and employee safety, reliability,  
15 productivity and customer service;
  - 16 • Provide feedback for continually improving process effectiveness and  
17 asset/business performance; and
  - 18 • Incorporate new methodologies and refining existing methodologies to improve  
19 effectiveness and productivity of processes in place.
- 20

21 The Strategy Development function provides the strategies and framework used by the  
22 System Investment function to develop programs and investments for Hydro One's  
23 distribution assets.

24  
25 **5.1.2 System Investment**

26  
27 Hydro One's distribution business strives to continually improve the efficiency and  
28 effectiveness of the regulated wires assets. This involves asset management processes and  
29 practices to ensure that the asset related decisions are consistent, cost-efficient and

1 effective. These decisions are aimed at developing a prioritized and rationalized  
2 investment plan for the operation, maintenance and upgrade of existing assets, and the  
3 addition of new assets.

4  
5 Hydro One utilizes a planning approach which recognizes that the distribution business  
6 encompasses a portfolio of assets that must be managed over the long term and reflects  
7 the fact that not all assets have the same life cycle characteristics or the same criticality  
8 with respect to achieving business values and performance.

9  
10 In preparing investment plans, the planning function utilizes Asset Condition Assessment  
11 information (described in Exhibit D1, Tab 2, Schedule 1), historical performance data,  
12 asset criticality, availability of spares and asset demographics to develop a detailed list of  
13 specific work needs.

14  
15 Each specific work need is evaluated against the business values, described in Exhibit A,  
16 Tab 14, Schedule 6, to establish the benefit of the work and the associated risks of not  
17 conducting it. Solutions are developed to mitigate these risks on a program-by-program  
18 basis. For each program the costs, benefits and risks are assessed to determine the impact  
19 ratings for each business value and all investments are then prioritized in accordance with  
20 the process described in Exhibit A, Tab 14, Schedule 6. This prioritized list of programs  
21 is then detailed, scheduled and implemented by the work execution functions.

22  
23 Substantial new generation is anticipated to connect to Hydro One's distribution system  
24 over the next few years, and the distribution planning function is evolving to proactively  
25 accommodate this new generation, while continuing to maintain reliability and power  
26 quality for other customers, and ensuring the necessary operational and planning  
27 flexibility to respond to changing system needs.

28

1     **5.2     Work Execution Functions**

2

3     The work execution functions provide engineering, design, estimating, construction,  
4     maintenance, and operating services. Customer relationship management and support  
5     services and supporting research, environmental, and public/employee health and safety  
6     programs are also provided by these functions. These activities are performed by a multi-  
7     disciplined workforce capable of performing tasks related to operating, maintaining and  
8     expanding the distribution business. There are three primary work execution functions  
9     within Hydro One: Customer Operations, Grid Operations and Engineering and  
10    Construction.

11

12    **5.2.1    Customer Operations**

13

14    The Customer Operations function is responsible for the design, estimating, scheduling  
15    and completion of line construction and maintenance work for lines, including forestry  
16    and customer care support services. As well, the Customer Operations function has  
17    accountability for planning and connecting new retail customers to the distribution  
18    system and to address local system planning issues. The work activities are managed  
19    through the following core processes:

20

- 21       • Estimating Process,
- 22       • Planning and Scheduling Process,
- 23       • Project Management Process,
- 24       • Customer Connection Process,

- 1 • Condition Assessment, Line Maintenance, and Lines Sustaining Capital work
- 2 execution,
- 3 • Lines Trouble Response and Correction Action Process,
- 4 • Lines Development Capital work execution,
- 5 • Work Program Management, and
- 6 • Work Reporting Processes.

7

8 Lines and Forestry services provide for the maintenance of overhead and underground  
9 distribution lines and for vegetation management. The vegetation management program  
10 is necessary to ensure that clearances to energized equipment are maintained and that  
11 these clearances provide a sustainable level of reliability.

12

13 Customer care services may be divided into the following high-level functions: meter  
14 reading; billing; settlements; customer contact handling; and collections.

15

#### 16 5.2.2 Grid Operations

17

18 The Grid Operations function provides maintenance and technical services for stations  
19 and protection and control. This function also provides central operations and services for  
20 distribution which includes distribution system operation from the OGCC. The work  
21 activities are managed through the following core processes:

22

- 23 • Estimating Process,
- 24 • Planning and Scheduling Processes,
- 25 • Condition Assessment, Station Maintenance, and Station Sustaining Capital work
- 26 execution,
- 27 • Trouble Response and Corrective Action Process,
- 28 • Work Program Management, and

- Work Reporting Processes.

The OGCC coordinates an extensive outage program with various internal stakeholders and external customers to support Hydro One's distribution expansion and maintenance programs. Required outages are assessed and coordinated to minimize their impact on reliability and customer operation.

Grid Operations also maintains back-up operating facilities which serve as a fully redundant back-up to the OGCC.

### 5.2.3 Engineering and Construction

The Engineering and Construction function provides services ranging from engineering and design to the construction and commissioning of new or enhanced facilities. These projects include the engineering, estimating, project management, and construction of stations, system protection and control, as well as engineering services as required. The work activities are managed through the following core processes:

- Estimating Process,
- Planning and Scheduling Process,
- Project Management Process, and
- Project/Program Controls Process.

## **6.0 RELIABILITY**

The reliability of the distribution system and its ability to deliver power to customers without interruption is measured using the following two OEB and industry metrics:

- 1       • System Average Interruption Duration Index (“SAIDI”)
- 2       • System Average Interruption Frequency Index (“SAIFI”)

3

4 SAIDI is a measure that indicates the amount of time without power that an average  
5 customer on Hydro One Distribution’s system experienced in a given year. SAIFI is a  
6 measure that indicates the number of times that an average customer on Hydro One  
7 Distribution’s system was interrupted in a given year.

8

9 Reliability performance is affected by the level of equipment maintenance and  
10 replacement programs, which ensure assets remain in good operating condition, and by  
11 the level of vegetation management, which ensures that outages caused by tree contacts  
12 are minimized. In addition, the time required to respond to a power interruption has a  
13 direct impact on restoration time and therefore impacts the SAIDI measure.

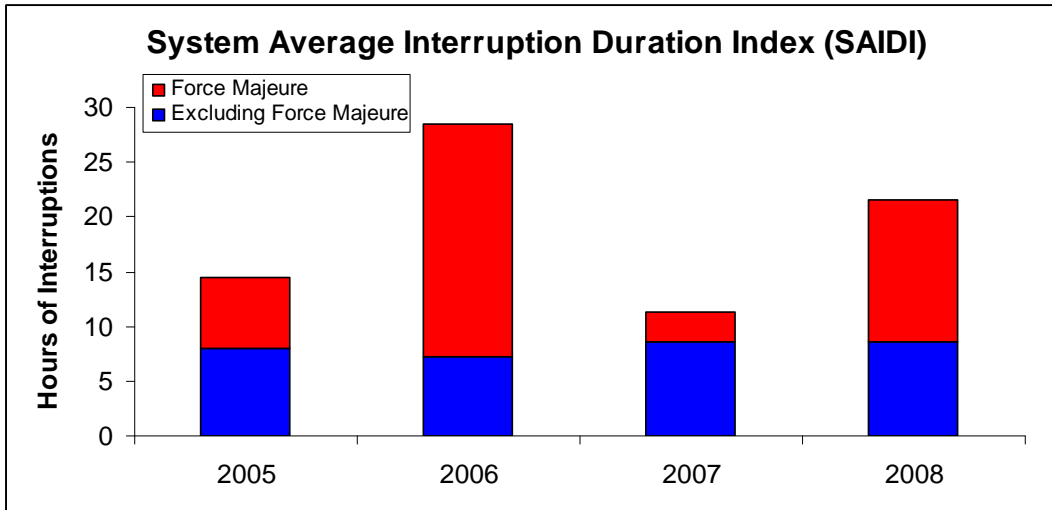
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15 The following two figures illustrate Hydro One Distribution’s reliability performance  
16 over the 2005 to 2008 period. Note that an event is considered *force majeure* when it  
17 impacts more than 10% of customers serviced by Hydro One Distribution.

18

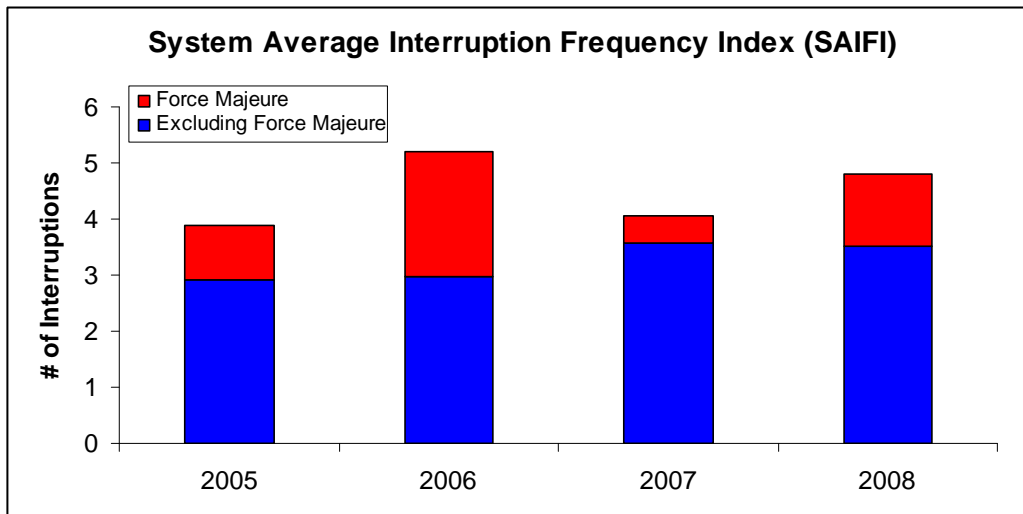
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**Figure 2: Yearly SAIDI Performance**



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**Figure 3: Yearly SAIFI Performance**



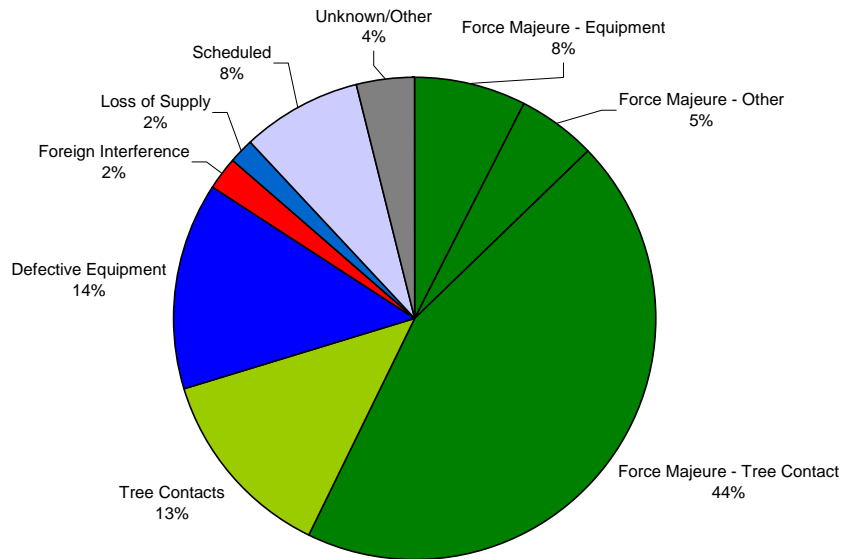
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9 Excluding *force majeure* events, performance for SAIDI has remained relatively  
10 consistent during the 2005 to 2008 period and SAIFI has deteriorated in 2007 and 2008.  
11 This deterioration was due to a shift in the customers impacted by storms in 2007 and  
12 2008 compared to 2005 and 2006. Including *force majeure* events, performance has

1 varied significantly from year to year due to variations in the number and severity of  
2 storms that have affected the Hydro One Distribution system in a given year.

3  
4 Figure 4 below illustrates the factors that contributed to the SAIDI performance over the  
5 2005 to 2008 period.

6  
7 **Figure 4: Contributions to SAIDI - Four Year Average 2005 – 2008**  
8

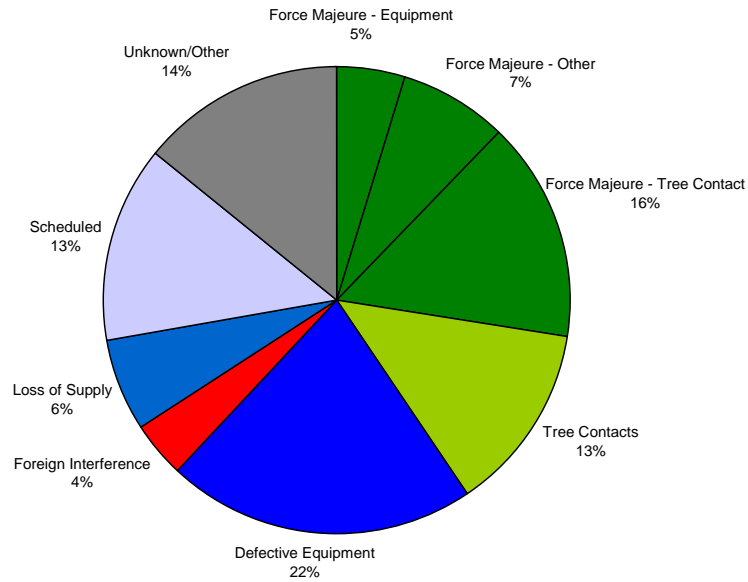


9  
10  
11 Outages attributed to *Force majeure* events (e.g. high winds, ice or snow) contributed to  
12 57% of SAIDI. With a focus on specific causes, it is noted that tree contacts account for  
13 57% of total SAIDI (44% *force majeure* and a further 13% excluding *force majeure*).  
14 The next largest contributor to SAIDI was defective equipment at 22%. (8% *force*  
15 *majeure* and a further 14% excluding *force majeure*).

16  
17 Figure 5 below illustrates the factors that contributed to the SAIFI performance over the  
18 2005 to 2008 period.

1  
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**Figure 5: Contributions to SAIFI - Four Year Average 2005 - 2008**



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4

5 Tree contact was the main contributor to SAIFI totaling 29% (i.e. 16% *force majeure* and  
6 a further 13% excluding *force majeure*). The other significant contributor was defective  
7 equipment at 27% (i.e. 5% *force majeure* and a further 22% excluding *force majeure*).