ATTACHMENT 2-1

DISTRIBUTION SYSTEM PLAN

MILTON HYDRO DISTRIBUTION INC.

MILTON HYDRO DISTRIBUTION INC.

2016 -2020 Distribution System Plan

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Introduction

Milton Hydro Distribution Inc. ("MHDI" or "Milton Hydro") is an electricity distributor licensed by the Ontario Energy Board (OEB). In accordance with its Distribution License ED-2003-0014, Milton Hydro is responsible for distributing electricity to approximately 36,000 business and residential customers within the Town of Milton. Milton Hydro is a wholly-owned subsidiary of Milton Hydro Holdings Inc., which is owned by the Town of Milton. Milton Hydro has been providing safe, reliable, and affordable electricity service for over a century.

Milton Hydro is supplied electricity from four Hydro One owned and operated transformer stations and one Oakville Hydro owned and operated transformer station, at voltages of 44kV and 27.6kV. MHDI is transmission connected at two of the 5 transformer stations and as such is considered a partially embedded distributor. Milton Hydro supplies electricity at three voltage levels, 27.6kV, 13.8kV, and 8.32kV. MHDI utilizes low voltage distribution assets including three phase, two phase and single phase circuits, transformers, poles and four distribution substations. Revenue is earned by MHDI by delivering electric power to the homes and businesses in the Town of Milton. The key industrial sectors in Milton are automotive, advanced manufacturing, distribution and food production. The distribution rates charged and the performance standards that the energy delivery system must meet are regulated by the OEB.

Milton Hydro is a mixed urban/rural utility and continues to expand and reinforce its distribution system in order to meet the demand of new and existing customers in its service territory. The increase in demand has been driven by the growth being experienced by the Town of Milton, growth which is projected to continue to 2031. In addition Milton Hydro upgrades existing plant that is at the end or approaching the end of its useful life.

MHDI is responsible for maintaining distribution and infrastructure assets deployed over 371 square kilometers (including 549 kilometers of overhead lines and 416 kilometers of underground lines – data as of October 1, 2014) extending to the boundaries of the Town of Milton consisting of 315 square kilometres of rural service area and 56 kilometres of urban service area.

Milton Hydro's Distribution System Plan (DSP) is designed to support the four key OEB objectives from the "Report of the Board – A Renewed Regulatory Framework for Electricity":

1. Customer focus
2. Operational effectiveness
3. Public policy responsiveness
4. Financial performance

Milton Hydro's Distribution System Plan was developed for the 2016 to 2020 period based on its existing asset management processes and capital expenditure planning. The DSP documents the practices, policies and processes that are in-place to ensure that investment decisions support MHDI's desired outcomes in a cost effective manner and provides value to the customer. The Distribution System Plan integrates information which results in an optimal investment plan covering:

- System expansion considerations
- System renewal considerations
- Regional planning considerations
- Renewable generation considerations
- Smart grid considerations

- Customer value considerations
- Alignment with public policy objectives

MHDI has adopted good utility practices of the electricity distribution industry. This has included adhering to the OEB's Distribution System Code that sets out both good utility practices, minimum performance standards for electricity distribution systems in Ontario, and minimum inspection requirements for distribution equipment. Consistent with good practices, over the years MHDI has maintained its equipment in safe and reliable working order and upgraded or replaced its equipment often in conjunction with government and regulatory customer centered themes (e.g. smart grid development).

In developing the long-term DSP, MHDI's objective is to ensure that the future distribution system is designed to deliver power at a quality and reliability level that balances customer's cost and service expectations and optimizes asset lifetime cost by balancing preventative maintenance, and end-of life replacement.

MHDI considers performance-related asset information including, but not limited to, data on reliability, asset age and condition, loading, customer connection requirements, and system configuration, to determine investment needs of the distribution system.

MHDI's DSP demonstrates prudence in the pacing and prioritizing of non-discretionary investments, specifically those related to system renewal (e.g. planned pole replacement) system service (e.g. smart grid development) and general plant (e.g. fleet and information technology).

Distribution System Plan (5.2)

Distributors are encouraged to organize the required information using the section headings indicated. If a distributor's application uses alternative section headings and/or arranges the information in a different order, the distributor shall demonstrate that these requirements are met by providing a table that clearly cross-references the headings/subheadings used in the application as filed to the section headings/subheadings indicated below.

MHDI's Distribution System Plan has been prepared in accordance with Chapter 5 of Filing Requirements for Electricity Transmission and Distribution Applications ("DS Plan Filing Requirements").

MHDI has organized the required information using the section headings in the DS Plan Filing Requirements. Investment projects and activities have been grouped into one of the four OEB defined investment categories listed below, based on the 'trigger' driver of the expenditure:

System access - investments are modifications (including asset relocation) to the distribution system MHDI is obligated to perform to provide a customer (including a generator customer) or group of customers with access to electricity services via MHDI's distribution system

System renewal - investments involve replacing system assets to extend the original service life of the assets and thereby maintain the ability of MHDI's distribution system to provide customers with electricity services.

System service - investments are modifications to MHDI's distribution system to ensure the distribution system continues to meet MHDI operational objectives while addressing anticipated future customer electricity service requirements

General plant - investments are modifications, replacements or additions to MHDI's assets that are not part of the distribution system; including land and buildings; tools and equipment; rolling stock and electronic devices and software used to support business and operations.

The electric distribution system is capital intensive in nature and prudent capital investments and maintenance plans are essential to ensure the sustainability of the distribution network. MHDI's Distribution System Plan documents the practices, policies and processes that are in-place to ensure that decisions on capital investments and maintenance plans support MHDI's desired outcomes in a cost effective manner and provides value to the customer.

This Distribution System Plan documents the capital and maintenance activities that MHDI has completed in the 2010 – 2014 period, MHDI capital plans for 2015, and the MHDI plans for the 2016 – 2020 forecast period.

Distribution System Plan overview (5.2.1)

This section provides the Board and stakeholders with a high level overview of the information filed in the DS Plan, including but not limited to

a. Key elements of the Distribution System Plan that affect its rates proposal (5.2.1 a)

key elements of the DS Plan that affect its rates proposal, especially prospective business conditions driving the size and mix of capital investments needed to achieve planning objectives

It is expected that the operational and service requirements driving MHDI's capital expenditures, and found within its DSP, will generally remain consistent through the 2016 to 2020 planning window. The projected expenditures for 2016 and going forward reflect the spending needs of a distribution electric utility serving a growing customer base with a diverse collection of physical assets. Specific investment category requirements are;

- System Access spending due to customer connection needs and 3rd party infrastructure needs requiring non-discretionary plant relocation;
- System Renewal investments required to replace aging pole assets and other discrete renewal needs;
- System Service investments that promote the continual growth and development of MHDI's WiMAX based Smart Grid.
- System Service investments to provide for feeders for a new transformer station in 2020;
- General plant investments to meet the needs in areas such as Fleet and IT.

A summary of Milton Hydro's proposed capital investments for the 2016 – 2020 forecast period is provided in **Table 1**.

Table 1 – Capital Expenditures Forecast

OEB Investment Category	Capital Expenditures Forecast ($'000)					Average Annual Investment	% of Annual Investment
	2016	**2017**	**2018**	**2019**	**2020**	**2016 - 2020**	**2016 - 2020**
System Access	$7,906	$8,092	$6,212	$6,411	$6,878	$7,100	65.1%
System Renewal	$1,863	$1,821	$1,790	$1,800	$1,725	$1,800	16.5%
System Service	$1,139	$1,225	$1,350	$1,350	$1,500	$1,313	12.0%
General Plant	$720	$701	$711	$676	$696	$701	6.4%
Total	$11,628	$11,839	$10,063	$10,237	$10,799	$10,913	100.0%

Table 2 – 2016 Capital Expenditures

OEB Investment Category	2016 Investment ($'000)	% of Annual Investment	Average Annual Investment	% of Annual Investment
	2016	**2016**	**2016 - 2020**	**2016 - 2020**
System Access	$7,906	68.0%	$7,100	65.1%
System Renewal	$1,863	16.0%	$1,800	16.5%
System Service	$1,139	9.8%	$1,313	12.0%
General Plant	$720	6.2%	$701	6.4%
Total	$11,628	100.0%	$10,913	100.0%

From **Table 1** and **Table 2** it can be seen that the major driver of Milton Hydro's capital expenditures over the forecast period will be System Access driven investments.

The following section highlights some of the factors influencing the proposed spend by OEB Investment Category. More detailed project information is provided in the **Capital Expenditures** section.

System Access

System Access projects are driven by customer connection needs and 3rd party infrastructure needs requiring non-discretionary plant relocation.

As shown in **Table 2**, 68% or $7.9 million of Milton Hydro's planned capital expenditures for 2016 are System Access specific. As can be seen in **Table 1** this is typical of the capital expenditures distribution for the 2016 – 2020 forecast period.

Milton Hydro's proposed System Access investments are driven by 3 primary project types:

1. New Subdivisions
2. Customer Connection (other than new subdivisions)
3. Roadway Relocations

New Subdivisions are the single largest proposed investment in the System Access category. In 2016 Milton Hydro projects a gross investment of $3.78 million will be required for New Subdivisions in the Town of Milton. This represents approximates 47.8% of the 2016 System Access investment and approximately 32.5% of the 2016 capital budget. The investment represents a connection of 1,500 new residential units in 2016.

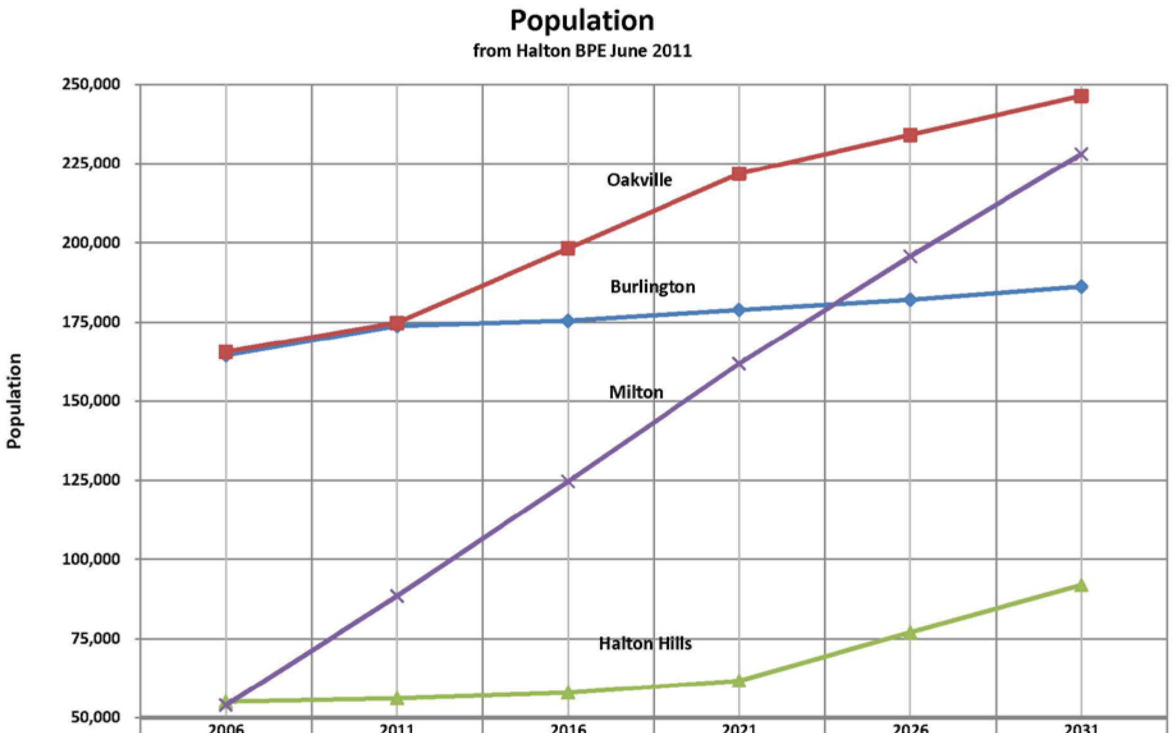
Customer Connections represents approximately a $0.98 million investment in 2016. Accounting for approximately 12.36% of the System Access budget this amount represents the customer demand work Milton Hydro must accommodate. This cost represents over 100 new connections ranging from individual stand-alone residential connections to new industrial - commercial customers requiring dedicated three phase transformation.

Roadway Relocations are primarily driven by the Region of Halton and the Town of Milton and in 2016 represent a $3.35 million investment or 39.9% of the total System Access investment. In 2016, collectively, the Town of Milton and Region of Milton have indicated a total of 9 (nine) projects requiring Milton Hydro investments ranging from $90,000 to $1,000,000 will be required.

Business Conditions – The Town of Milton has seen steady growth in Industrial, Commercial and Institutional (ICI) activities. The 2008 – 2013 period saw an annual average of 163 building permits issued representing ~$149M in annual construction value. Residential construction has also been steady over the years but did see a drop off in 2013. Milton is still building out and has been identified as an Urban Growth Centre and as such ICI and residential development is expected to continue. Of significant interest is the Milton Education Village. This 400 acre integrated neighbourhood will include a university campus, an innovation centre, the Milton Velodrome, a transit hub, student and residential housing. A link to Halton Region's Economic Review web site has been included in **Appendix A – Document Links**.

Town of Milton Road Projects – A multi-year schedule (2014-2024) has been published by the Town and is reflected in Milton Hydro's capital projects. A list of the Town of Milton Road Projects has been included in **Appendix B – Road Works**.

Halton Region Road Projects – A multi-year schedule (2014-2031) has been published by the Region and is reflected in Milton Hydro's capital projects. A list of the Halton Region Road Projects has been included in **Appendix B – Road Works**.



	2006	2011	2016	2021	2026	2031
Burlington	164,446	173,761	175,438	178,847	182,034	186,169
Oakville	165,529	174,780	198,205	221,826	234,121	246,400
Halton Hills	54,978	56,066	57,922	61,672	77,003	91,885
Milton	53,938	88,438	124,645	161,750	195,735	228,084

Figure 1 – Town of Milton BPE Population Growth Projections 2016 to 2031

System Access projects are intimately tied to the growth being experienced by the Town of Milton. The Region of Halton has published Best Planning Estimates (BPE) for the Region of Halton, including the Town of Milton's BPEs. **Figure 1** details the projected population growth the Town of Milton can expect to 2031. This level of growth is a strong indicator that ongoing System Access investments will be required by Milton Hydro.

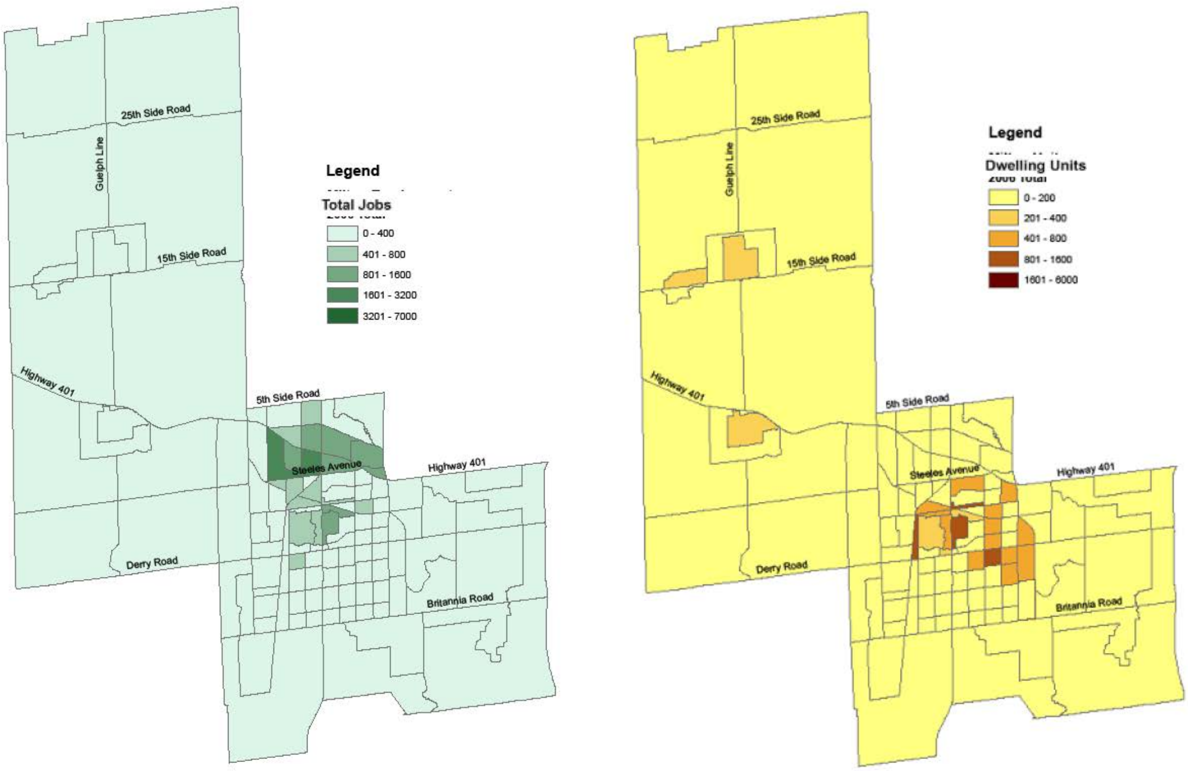


Figure 2 – Town of Milton Growth to 2006

Extracted from the Region of Halton's BPEs **Figure 2**, **Figure 3**, **Figure 4** and **Figure 5** further demonstrate the level of growth the Town of Milton can expect to 2031.

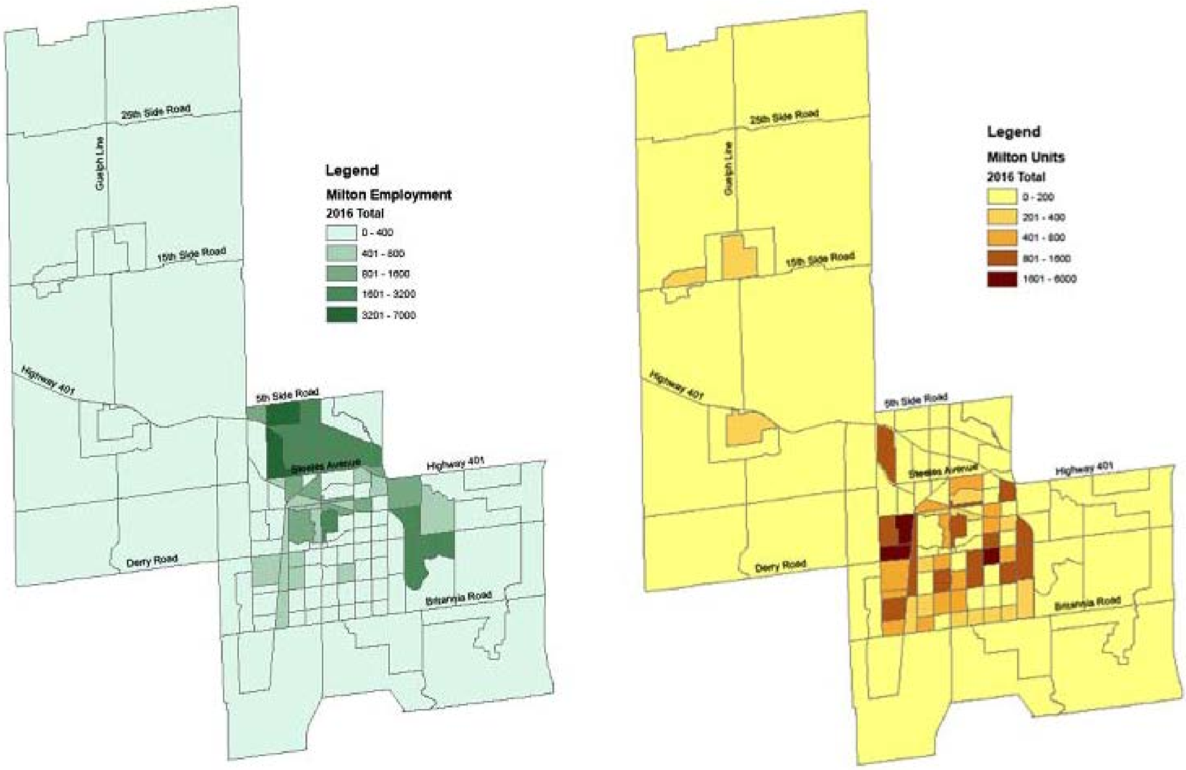


Figure 3 – Town of Milton Growth to 2016

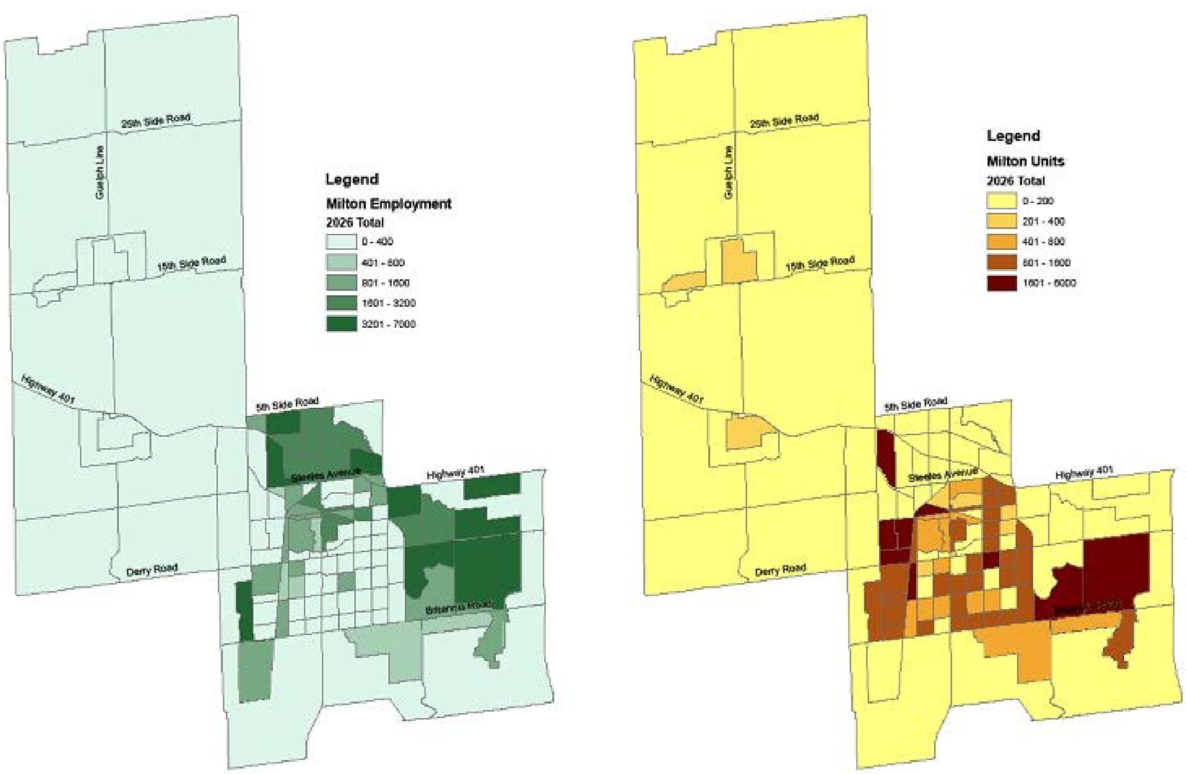


Figure 4 – Town of Milton Growth 2026

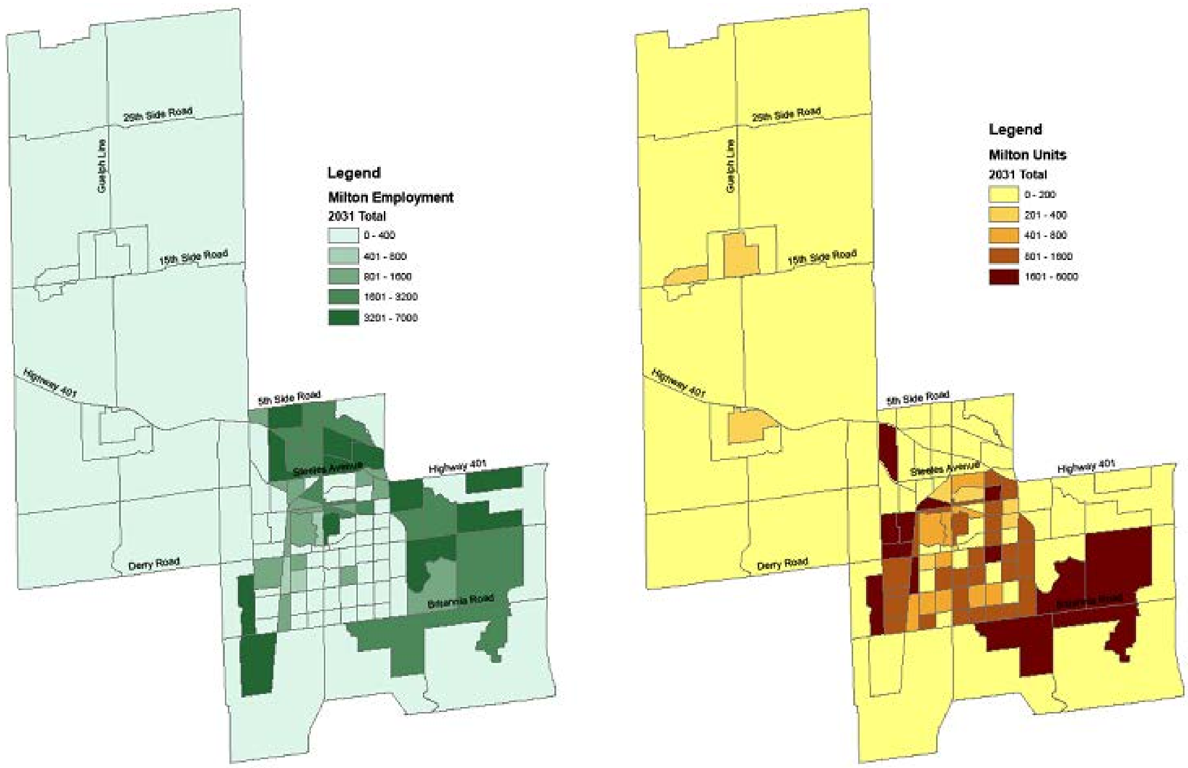


Figure 5 – Town of Milton Growth to 2031

Halton Region Official Plan (March 2015)

Milton is expected to continue to grow from a population of 59,800 in 2007 to 147,400 in 2021 and 228,000 by 2031. The Halton Region Official Plan (ROP) also identifies Intensification Areas that consist of Urban Growth Centres, Major Transit Station Areas and Intensification Corridors. Intensification Corridors are intended to be planned to function as urban main streets that have a compact, mixed use, well designed, pedestrian friendly and transit-oriented built form.

The Milton Urban Centre is one of five Urban Centres identified in the Halton Region Official Plan. The Urban Centre boundary is defined in the ROP and implements the Urban Growth Centre identified in the Growth Plan. Significant intensification growth around Milton is identified in both the 2012 - 2021 period and 2021 – 2031 period of the ROP.

Milton is identified as a major mobility hub and an additional major transit station is proposed for the Trafalgar/407 area.

Future strategic employment areas have been identified along the 407 and 401 highway corridors and southwest Milton. They are strategically located with respect to major transportation facilities such that they are best suited for employment purposes to meet employment land needs beyond the planning horizon of 2031.

A stated goal in the ROP is to encourage and ensure the conservation and wise economic use of energy and to minimize adverse effects caused by its provision. A key Region objective is to take an active part in decisions regarding the planning and development of utility corridors. The link to the complete Halton Region Official Plan is in **Appendix A – Document Links**.

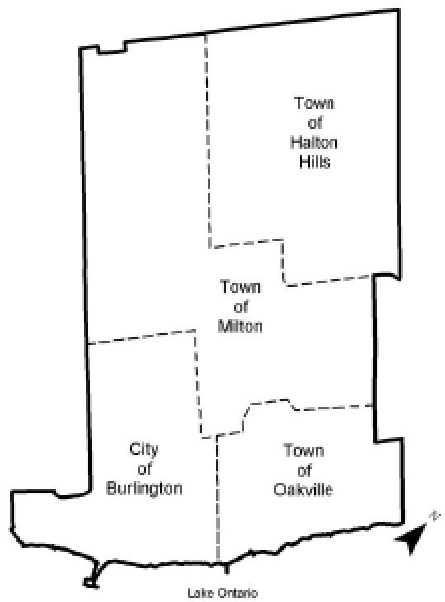


Figure 6 – Local Municipalities in Halton Region

Other key elements that will influence System Access investments through the period of the DSP:

Ontario Places to Grow Act (“The Growth Plan”) – The Town of Milton has been identified as one of the Urban Growth Centres in the Greater Golden Horseshoe. As an urban growth centre, Milton is expected to be planned:

1. as a focal area for investment in institutional and region-wide public services, as well as commercial, recreational, cultural and entertainment uses;
2. to accommodate and support major transit infrastructure;
3. to serve as a high density major employment centre that will attract provincially, nationally or internationally significant employment uses;
4. to accommodate a significant share of Halton Region population and employment growth.

The Growth Plan loosely defines the Milton Urban Growth Centre (136.8 hectares) as downtown Milton, primarily along Main St. The Growth Plan mandates that Urban Growth Centres will account for a significant amount of the municipality’s future population and employment growth. The Growth Plan also mandates that the Milton Urban Growth Centre be planned to achieve a minimum density of 200 residents and jobs combined per gross hectare by year 2031.

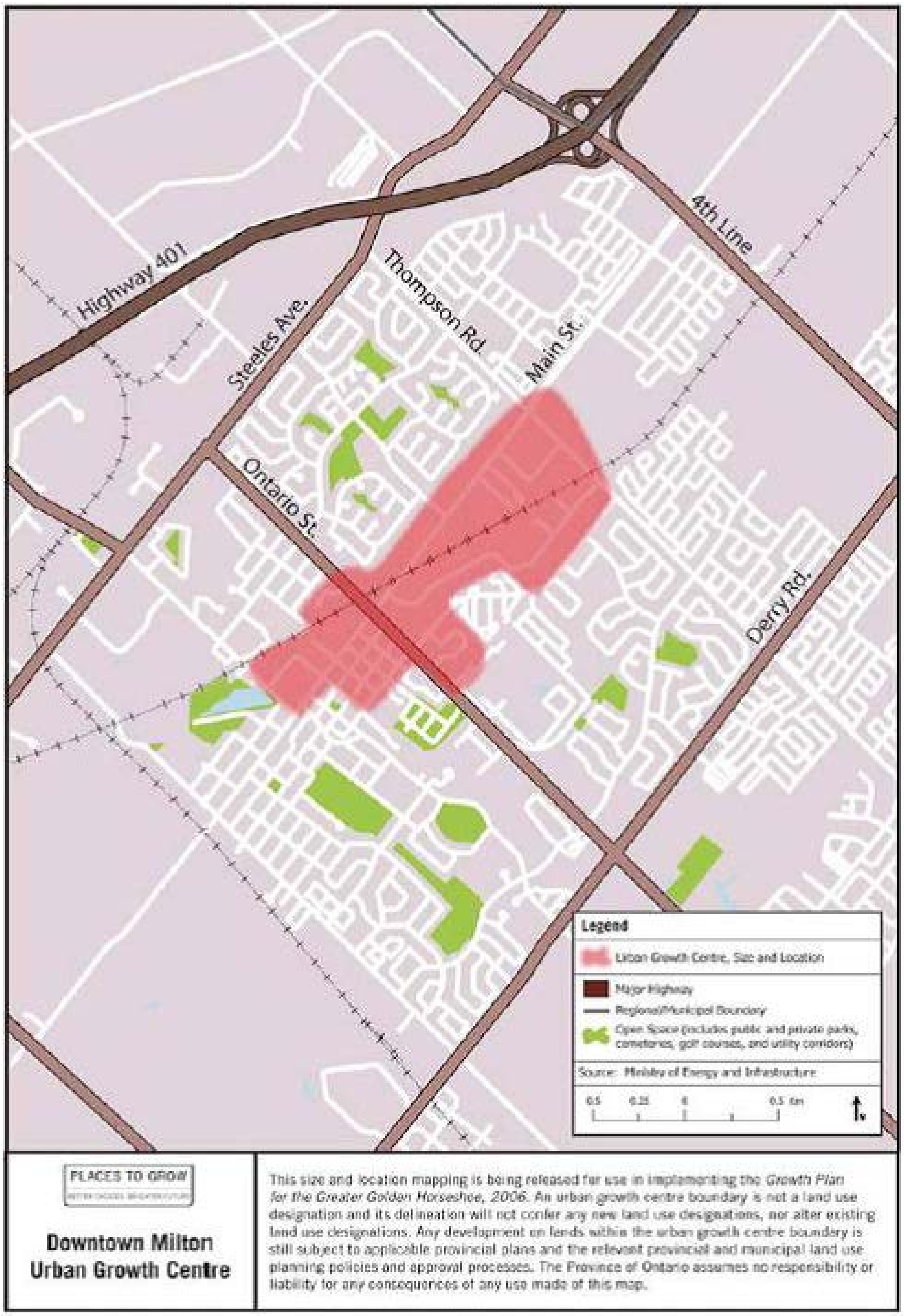


Figure 7 – Downtown Milton Urban Growth Centre

The Growth Plan also recognizes Major Transit Station Areas as areas that will be planned to achieve increased residential and employment densities. Transit plans will provide for inter-regional transit links between the Milton, Mississauga and Toronto Urban Growth Centres. The Milton GO Rail and Bus Station is considered a Major Transit Station Area (Mobility Hub). The Growth Plan states that these locations will be planned to achieve a mix of residential, office, institutional and commercial development as appropriate to support ridership along these routes.

Town of Milton Strategic Plan – Destiny Milton 2 (DM2) (2006)

The Town of Milton Strategic plan is composed of three components: visioning, service area plans and land use. The plan encourages the location of high density development on major arterial roads, transit corridors and employment areas along with infilling and intensification in the existing urban area.

Town of Milton Master Transit Plan 2013-2017

This plan focuses on the transit services to serve the Urban Growth Centre needs.

Town of Milton Intensification Study – 2010

This study was performed in 2010. Intensification is defined as development of a property, site or area at a higher density than currently exists through:

- redevelopment, including the reuse of brownfield sites;
- the development of vacant and/or underutilized lots within previously developed areas;
- infill development; and,
- the expansion or conversion of existing buildings.

The Intensification Strategy implements the Province's and the Region of Halton's intensification requirements consistent with the Town of Milton Official Plan. The study assumes a 250 residents and jobs/hectare figure, higher than the OPGA target.

The study notes that:

"Site and building services and utilities such as waste storage facilities, loading, air handling equipment, hydro and telephone transformers and switching gears and metering equipment, shall be located and/or screened from public streets and adjacent residential areas or other sensitive land uses, in order to buffer their visual and operational effects."

In a number of development areas, new buildings are expected to have reduced setbacks and be located at or close to the street line.

This may present funding, location and operational issues for electricity infrastructure renewal.

Town of Milton Official Plan (OPA31) (2010)

The Town of Milton Official Plan – OPA31 implements the Urban Centres and Regional Corridors policies of the Provincial Growth Plan and the Halton Region Official Plan through the identification of the Urban Growth Centre in downtown Milton and the Milton GO Station as the Major Transit Station.

The plan requires all utilities to be placed underground except on major arterial streets.

Metrolinx Rapid Transit – Downtown Milton is identified as an Anchor Hub in the Greater Toronto & Hamilton Area (GTHA). Anchor Hubs are major transit station areas associated with an urban growth centre (as defined in the Province's Growth Plan for the Greater Golden Horseshoe). The Downtown Milton anchor hub includes the Milton GO Station and bus bays for Milton Transit. This anchor hub is planned to have integrated Express Rail, Rapid Transit and local service.

System Renewal

System Renewal investments involve replacing system assets to extend the original service life of the assets and thereby maintain the ability of MHDI's distribution system to provide customers with electricity services.

As documented in **Table 2**, 16% or $1.7 million of Milton Hydro's planned capital expenditures for 2016 are System Renewal projects. As can be seen in **Table 1** this is typical of the capital expenditures distribution for the 2016 – 2020 forecast period.

Milton Hydro's proposed System Renewal investments are driven by 3 primary project types:

1. Pole Replacements
2. Overhead Line Rebuilds
3. Underground Line Rebuilds

These 3 project types reflect the need to proactively manage the replacement of assets that are at or near end of life. Replacement plans ensure that planning objectives related to reliability, customer satisfaction and operating cost control are achieved.

Pole Replacements refer to replacing individual poles that are found to be at the end of their useful service life. Milton Hydro inspects 1/3 of its pole population on an annual basis and based on those results ether:

- Replaces the pole immediately
- Schedules poles for replacement during the next budget year
- Rates the pole and inspects the pole during future inspection cycles

In 2016 Milton Hydro proposes to spend $500,000 on Pole Replacements. This represents approximately 26.8% of the System Renewal budget and 4.3% of the total capital spend for 2016

Overhead Line Rebuilds are the replacement of entire sections of overhead pole lines. These projects are driven by end of useful life factors in conjunction with pacing of capital investments to ensure reliability, safety and a sustainable investment schedule. In 2016 Milton Hydro is proposing 3 Overhead Line Rebuilds totalling $798,400 or 42.8% of the System Renewal budget.

Underground Line Rebuilds are the replacement of entire sections of underground primary distribution circuits. These projects are driven by end of useful life factors in conjunction with pacing of capital investments to ensure reliability, safety and a sustainable investment schedule. In 2016 Milton Hydro is not proposing any material Underground Line Rebuild projects. In 2017 Milton Hydro is proposing 1 Underground Line Rebuild totalling $350,000. This represents 19.2% of the 2017 System Renewal budget or 3.0% of the total 2017 capital expenditure.

System Service

System Service investments are made to ensure the distribution system continues to meet operational objectives while addressing current and future customer and regulatory requirements. These investments help to maintain and improve reliability and safety measures associated with the distribution system and improve operational system efficiencies. Milton Hydro continues to make System Service investments that promote the growth and development of MHDI's WiMAX based Smart Grid.

In 2016 Milton Hydro is proposing to invest approximately $1.14 million in System Service projects. This proposed investment may be categorized into 2 primary project types:

- WiMAX Communication Investments
- Automated Equipment Investments

WiMAX Communication Investments refer to the deployment of a WiMAX based communication infrastructure utilizing the 1.8 GHz band allocated by Industry Canada for utility operations. Milton Hydro will utilize this communication infrastructure as the primary means of remotely accessing:

- Automated distribution switches
- Smart fault Indicators
- Metering points

In 2016 Milton Hydro plans to invest $770,000 in WiMAX Communication infrastructure. This represents 67.6% of the System Access budget or 6.6% of the proposed total 2016 capital investment.

Automated Equipment Investments refers to the deployment of automated switches and smart fault indicators throughout Milton Hydro's service territory. The ability to remotely operate and monitor the distribution system will help to maintain and improve reliability and safety measures associated with the distribution system and improve operational system efficiencies. In 2016 Milton Hydro proposes to invest $369,000 in automated equipment. This represents 32.4% of the System Service budget or 3.2% of the proposed 2016 capital budget.

Milton Hydro's automation efforts will strive to satisfy the government's smart grid requirements while introducing a level of automation that enhances MHDI's ability to respond to system events and maintains a focus on the needs of Milton Hydro's customers. Smart grid development will enhance MHDI's ability to provide a variety of energy services, including conservation and demand management, and distributed generation, in support of provincial energy policy and community energy plans.

General Plant

General plant investments are investments that are not part of its distribution system. These investments meet the needs in areas such as Fleet and IT.

As listed in **Table 1**, Milton Hydro proposes to invest $720,000 on General Plant in 2016, primarily in its fleet. Milton Hydro proposes to invest $510,000 to acquiring a transit van, one squirt boom truck and a 46' single bucket truck. These trucks are used for the construction and maintenance of overhead/underground plant, and for the emergency restoration services.

The remainder of the 2016 General Plant investment ($210,000) is comprised of investments in computer software, computer hardware, major tools and stores equipment.

b. Sources of cost savings (5.2.1 b)

the sources of cost savings expected to be achieved over the forecast period through good planning and DS Plan execution

MHDI planning and investment processes follow good utility practices that are executed through the Distribution System Plan. Good utility practices have inherent cost efficiencies through sound decision making, thoughtful compromises, right timing and optimum expenditure levels. Some specific MHDI Distribution System Plan cost efficiencies are expected to be achieved through the following:

- Proactive maintenance and replacement of plant will reduce reactive maintenance costs and improve service to the customer that will result in fewer and shorter duration outages that will have a beneficial impact on the cost of outages to customers.
- The use of software (e.g. Spidacalc software to be purchased in 2015) to optimize plant designs will reduce overdesign and ensure that current CSA standards for non-linear design of pole loading and structural stability are adhered to. CYME software is already in use to optimize distribution system configuration and loading.
- Improved use of the GIS to capture/access plant attribute data (e.g. nameplate data, condition, inspection/maintenance histories, etc.) will aid in cost control through optimization of the asset's lifecycle.
- Prudent investment in distribution automation (e.g. remotely operated switches), as part of MHDI's Smart Grid development, will improve day to day switching operations and have a positive impact on improving outage restoration times thereby mitigating customer outage costs.
- Mobile equipment (i.e. laptops) are in use that provide paperless and timely access to MHDI GIS maps and service orders for work crews. During the period of the DSP it is intended to add GIS information, inspection programs and report forms to the mobile devices to facilitate electronic transmission of information versus paper processes.
- Elimination of MS#4 in 2015 through conversion to 27.6kV supply. This will eliminate incremental losses of substation transformation losses and will allow for redistribution of maintenance resources to other system needs. Contract work associated with the substation will also be eliminated. Environmental risk due to potential transformer oil spill/fire will also be eliminated.
- Optimized distribution feeder costs through the agreement to use feeder positions and station capacity at Oakville's Glenorchy MTS.
- Ongoing conversion of CableCAD data to the ESRI GIS has been contracted out to Guelph Hydro.
- Control room functions have been contracted out to Guelph Hydro beginning in November 2014. This is expected to save MHDI building, equipping and staffing a control room. MHDI's head office will be moving to a new location in 2015 due to lease expiry and availability of existing facilities. The new location is an existing building being renovated to meet MHDI's needs.

c. Period covered by the Distribution System Plan (5.2.1 c)

the period covered by the DS Plan (historical and forecast years)

For the purposes of this Distribution System Plan, 2010 to 2014 is the historical period, 2015 is the Bridge Year, 2016 is the Test Year and the forecast period is for 2017 to 2020.

d. Vintage of the information (5.2.1 d)

an indication of the vintage of the information on investment 'drivers' used to justify investments identified in the application (i.e. the information should be considered "current" as of what date?

The information generally used throughout the DSP is based on available information established between late-2013 to late-2014, and should be considered as current. Specific variances from this time frame are as noted. MHDI statistics are based on 2014 RRR filings.

e. MHDI asset management process (5.2.1 e)

where applicable, an indication of important changes to the distributor's asset management process (e.g. enhanced asset data quality or scope; improved analytic tools; process refinements; etc.) since the last DS Plan filing

This is the first Distribution Plan filed by MHDI and as such there are no changes from any previously filed plan. Previous information with respect to MHDI's Asset Management processes was filed in MHDI's 2011 COS application along with MHDI's 2010-2015 Asset Management Plan.

In 2012, MHDI procured an ESRI based GIS to replace its outdated CableCAD system. The GIS system will be leveraged for asset management, customer service, operations, executive dashboards and project planning processes. It is planned to integrate the GIS system with MHDI's WO management system to automatically estimate job costs by selecting the GIS plant to be replaced and using embedded unit costs to generate the project cost. The current GIS development focus is on asset lifecycle information which is used to support MHDI's IFRS efforts. Asset data quality continues to improve with the population of plant attribute data in the GIS.

In 2012, MHDI procured a Survalent SCADA system to facilitate the deployment of automated switches, smart fault indicators and a WiMAX based communications infrastructure. The SCADA system consists of the hardware and software necessary to monitor and control the entire distribution system from one central location. The SCADA investment enables the abilities of a smart infrastructure in systematic manner that incorporates operational standards that address reliability, security, process, and safety.

In 2014, MHDI contracted out its control room operations to Guelph Hydro to fully realize the benefits associated with a smart infrastructure and to address the operational/switching intricacies associated with MHDI's growing, dynamic distribution system.

Since the last COS application, Milton Hydro has modified its tree trimming policy effective May 26, 2014. The revised policy reflects the experience of the December 2013 ice storm and subsequent discussions with customers regarding effective tree trimming objectives.

Non-discretionary capital investments are automatically included in the budget year they are required/scheduled. It is recognized that non-discretionary projects (i.e. legal, regulatory, etc.) are not displaced for discretionary projects. This occurs during the budgeting part of the planning process.

f. Contingent activities/events affecting the Distribution System Plan (5.2.1 f)

aspects of the DS Plan that relate to or are contingent upon the outcome of ongoing activities or future events, the nature of the activity (e.g. Regional Planning Process) or event (Board decision on LTLT) and the expected dates by which such outcomes are expected or will be known

There are a number of ongoing and future activities in the MHDI service areas that may/will impact on capital project prioritization and spending as outlined in the Distribution System Plan.

Customer Connections - The number and timing of new connections is dependent on customer location and service requirements. Best estimates for annual customer connections (Subdivision development) investments have been provided.

Road Projects – Both the Region and Town road project list do cover beyond the 2016 planning period of the DSP and is subject to change. MHDI will be required to react to schedule additions/changes as they occur during the period of the DSP. The road authorities are required to give as little as 6 months' notice to MHDI for work that would affect MHDI plant.

GTA West – Northwest Sub-Region supply study

Milton Hydro participated in the IESO/OPA led GTA West – Northwest Sub-Region supply study. The Integrated Regional Resource Plan (IRRP) which addresses needs for the Northwest Sub-Region was completed in April 2015. A link to the Northwest GTA sub-region Integrated Regional Resource Plan (IRRP) has been included in **Appendix A – Document Links**

The final IRRP determined there will be is a need for new transformation facilities to service Milton Hydro load growth by 2020. See **Final deliverables of the Regional Planning process (5.2.2 b)**. A copy of the Hydro One planning status letter has also been included in **Appendix G – Regional Planning Status Letter**.

Long Term Load Transfers

As of December 2014, MHDI had 91 load transfer customers where Milton Hydro is the physical distributor and the surrounding utilities are the geographic distributors. Any LDC activity, during the period of the DSP, to become the physical distributor would result in minor removal of MHDI plant.

Milton Hydro is also the geographic distributor to 159 LTLT customers supplied by other LDCs.

MHDI is aware of the OEB's proposed amendments to the Distribution System Code (DSC) outlined in the OEB letter dated February 20, 2015 (EB-2015-0006) and intended to facilitate the elimination of remaining LTLT arrangements between LDCs. MHDI's DSP as filed does not include any work for MHDI to become the physical distributor for any of the LTLT customers. MHDI will eliminate LTLT arrangements as prescribed by any amendments to the DSC.

Coordinated Planning with third parties (5.2.2)

To demonstrate that a distributor has met the Board's expectations in relation to coordinating infrastructure planning with customers, the transmitter, other distributors and/or the OPA or other third parties where appropriate, a distributor must provide

a. Description of the consultations (5.2.2 a)

a description of the consultation(s), including

- **the purpose of the consultation (e.g. Regional Planning Process);**
- **whether the distributor initiated the consultation or was invited to participate in it;**
- **the other participants in the consultation process (e.g. customers; transmitter; OPA);**
- **the nature and prospective timing of the final deliverables (if any) that are expected to result from or otherwise be informed by the consultation(s) (e.g. Regional Infrastructure Plan; Integrated Regional Resource Plan); and**
- **an indication of whether the consultation(s) have or are expected to affect the distributor's DS Plan as filed and if so, a brief explanation as to how.**

Milton Hydro serves the Town of Milton, a municipality expecting to see significant growth through to 2013. As the Local Distribution Company (LDC) Milton Hydro consults with various stakeholder to ensure input from those stakeholders is taken into consideration by Milton Hydro when developing the DSP. Milton Hydro has considered the input from the following stakeholders when preparing the DSP:

- Customers
- Town of Milton and Region of Halton
- Development Community
- Hydro One (the local Transmitter)
- Independent Electricity System Operator (IESO and former OPA roles)

Customer Consultation

Innovative Research Consultations Specific to the Application

In response to the Board's Filing Requirements to engage customers on the specific proposals contained in this Application, in May 2015 Milton Hydro retained Innovative Research Group, Inc. ("Innovative") to design, collect feedback and document its customer engagement and consultation process as part of the development of this Application. Milton Hydro asked that customers be engaged on both Milton Hydro's capital infrastructure and operational plans.

A complete copy of the Innovative Customer Consultation Report has been included in **Appendix I – Customer Consultation Report**.

In general, the consultation encompassed four core elements of customer engagement.

1. **Online Workbook**: The online workbook was promoted through traditional print advertising, email blasts to Residential and General Service < 50 kW customers, as well as Twitter and Milton Hydro's website. This first phase of the consultation was available to any Milton Hydro customer who wanted to participate

2. **General Service and Residential Consultation Focus Groups:** Similar to the online workbook, this qualitative phase of the consultation was designed to educate customers, assess their preferences and priorities, gauge reaction to proposed rate changes, and ultimately inform the quantitative phases of the consultation. The customer focus groups were randomly recruited by Innovative and met at Milton Hydro's offices. A workbook was used to provide the participants with core information about the provincial and local electricity system, Milton Hydro's proposed capital investment and operating spend to maintain system reliability, as well as the rate impact for each respective rate class. Participants were provided incentives in recognition of their time commitment and to help ensure diverse participation among Milton Hydro's customers.

3. **Mid-Market & Large Business Workshop**: General Service customers over 50 kW (GS > 50kW) were engaged through a Milton Hydro organized breakfast meeting workshop. This workshop included a presentation delivered by Milton Hydro's Director, Engineering on the utility's proposed capital and operating plans, its DSP and rate implication for this rate class, a Q&A session with Milton Hydro senior management, and the administration of an Innovative survey to collect customer preferences and needs as related to Milton Hydro's proposed plans, DSP and rate implications.

4. **Random Telephone Surveys**: Innovative conducted telephone surveys among Residential and General Service (GS < 50 kW) customers to provide a generalizable assessment of Milton Hydro's system plan and rate implications. Customers were randomly selected by Innovative from a customer list provided by Milton Hydro. The outcome of the consultations resulted in findings on the needs and the preferences of Milton Hydro's Residential, General Service <50 kW and General Service > 50 kW customer base. The overview includes feedback from customers who participated in the *qualitative stage* of the consultation where Innovative explored the range of issues related to Milton Hydro's rate application, as well as feedback from customers who responded to the quantitative stage where Innovative documented the incidence of *needs* and *preferences* across the customer population. Some of the highlights from each segment are presented below with direct customer comments in quotations.

Online Workbook

Milton Hydro and Innovative collaborated in May and June 2015 on the development of a workbook that would be used in the customer consultations and that would serve as the basis of the online workbook phase of the customer engagement program.

The objective of the workbook was to provide customers with information about the provincial electricity system, Milton Hydro's role within it, and the OEB rate application process. The workbook also included information on cost drivers, and Milton Hydro's response to these drivers, their investment plan for the next five years, and the impact this investment would have on customer rates. Survey questions embedded in the workbook allowed us to identify customer preferences and priorities, seek customer feedback on rate increases, and to inform the subsequent telephone survey phase of the consultation.

The Online Workbook was accessible to all Milton Hydro customers from June 17th to July 1st, 2015. Milton Hydro promoted the online workbook consultation to its customers in a number of ways:

- Ads were run in the local newspaper – The Milton Canadian Champion (print and online versions)
- E-mails were sent to 20,000 Milton Hydro customers for whom email addresses were available
- Details and a link to the consultation website were provided on the Milton Hydro website and Twitter

The breakdown of Online Workbook responses are as follows:

- 642 customers (including 18 business respondents) completed the entire Online Workbook

The results of the Online Workbook include:

- Almost nine-in-ten (88%) of respondents indicate being either *very* (43%) or *somewhat* (46%) satisfied with the service they receive from Milton Hydro. Only one-in-ten are either *somewhat* (7%) or *very* (3%) dissatisfied with their service. (Page 48)

- Asked how Milton Hydro might improve their service, only 234 of the 624 total respondents provided a response, which supports the high level of stated satisfaction with the utility. Of those who did provide a response, one-in-five (19%) said there is "nothing" Milton Hydro can do to improve service, and slightly fewer (16%) asked that they "reduce rates". Other mentions included "better customer service" (9%), "better online/website service" (6%), and "reduce outages" (6%). All other suggestions for improvement were mentioned by fewer than five percent of those who responded. (Page 49)

When it came to System Investments and Outages, customers responses were:

- Generally speaking, survey respondents have no issue with the frequency of outages they have recently experienced. Almost three quarters of respondents say the number of power outages they experienced over the last 12 months is either *very* (42%) or *somewhat* (31%) reasonable. Seven percent say the number of outages they experienced is *not very reasonable*, while another two percent say it is *not reasonable at all*. The remainder (12%) say they did not have any power outages. (Page 58)

- Considering the December 2013 ice storm, of the 624 Residential respondents, only 223 provided specific feedback on how Milton Hydro could have improved their service during the ice storm. Three-in-ten (30%) mention "better communication with customers", followed by "nothing" (15%), "did a good job" (9%) and "was not affected (7%). (Page 54)

- When dealing with aging equipment in the grid, three-quarters (75%) feel the best approach is to replace the equipment before it breaks down to avoid power outages, even if it means not getting all the use possible from each piece of equipment. Conversely, only one-in-five (19%) prefer a "run-to-failure" approach in which equipment breaks down before it is replaced in order to get the full value from each piece of equipment. (page 63)

- Almost nine-in-ten (88%) feel it is either *very* (35%) or *somewhat* (53%) important for Milton Hydro to invest now to modernize the grid, even though there are many other areas of needed investment, such as connecting new customers, replacing aging equipment and expanding system capacity for long-term growth. Only one-in-ten (9%) feel it is *not very important* (7%) or *not important at all* (2%) to invest in modernizing the grid at this point. (Page 64)

Milton Hydro's Planning:

- After reviewing the information provided in the workbook most (87%) feel Milton Hydro is planning for the future either very (38%) or somewhat (49%) well. Fewer than one-in-ten disagree (6% not very well, 2% not well at all). (Page 69)

Having gone through the workbook, respondents are then asked how they feel about the rate increase associated with Milton Hydro's investment plan. The results show:

- The total level of social acceptance to just over two thirds (67%). About one-in-seven (14%) say *the rate increase is reasonable and I support it*, but more than half (52%) say *I don't like it, but I think the rate increase is necessary*. Fewer than three-in-ten (28% say *the rate increase is unreasonable and I oppose it*, and the remaining five percent don't know how they feel about it. (Page 70)

Workbook-based Facilitated Discussions

Innovative conducted focus groups with Residential and General Service under 50 kW customers. The purpose of these focus groups was to provide customers with some education about their local distribution system, and then to garner their feedback on Milton Hydro's proposed investments for the next five years.

The consultation sessions were held in Milton on June 10th, 2015. A total of 15 General Service < 50 kW and Residential Customers participated in these consultation sessions which were separate for each rate class.

General Service under 50 kW Rate Class 7 participants

Residential Rate Class 8 participants

All customer recruitment lists were randomly generated and provided to Innovative by Milton Hydro. Customers were then contacted by telephone and screened by Innovative to determine whether or not they were appropriate participants for the research.

Summary of responses from customers (page 9) included:

- Overall, satisfaction with Milton Hydro is rated highly among both Residential and General Service customers who participated in the focus groups. In response to the question asked in the participant workbook, only two participants in each group indicated dissatisfaction with the service they receive from Milton Hydro. Furthermore, participants were also quite satisfied with how Milton Hydro responded to the ice storm of 2013.

- The majority of General Service participants experienced three or more outages in the year prior, however only two found this frequency to be unreasonable. It was also noted that system reliability depends on service area; one participant from the West side reported having no issues in regards to reliability or power quality.

- Residential participants are, for the most part, unconcerned with the reliability of the system, finding the number and duration of outages they experience to be acceptable.

- Suggested improvements from the General Service group focused largely on customer service. There was some dissatisfaction expressed when it came to connecting and resolving issues with Milton Hydro. Residential participants were most concerned with communication and education regarding their electricity consumption. These participants felt they would benefit from accessing real-time data so they can better manage their monthly expenditures.

- After reviewing the plan as presented in the workbook, participants from both groups are comfortable that Milton Hydro is planning for the future. With only one exception, all participants who offered an opinion felt that Milton Hydro is planning at least *somewhat well*.

- Furthermore, social acceptance is high in both groups. Only one participant in each group found the rate increase to be unreasonable; and while the majority of participants do not like the idea of an increase, they acknowledge its necessity for Milton Hydro to continue providing the level of service they are accustomed to.

- When asked how do you think Milton Hydro should address the number of customer unexpected power outages, 8 out of 15 responded either 'spend what is needed to reduce the number of unexpected power outages' or 'spend what is needed to maintain the current level of unexpected outages'. The remaining four customers replied either 'don't know' or left the response blank. No customer answered 'accept more unexpected power outages in order to help keep customer costs from rising'. (Page 26)

- When asked about *replacing equipment before it breaks down* 13 out of 15 responded in agreement while 2 respondents did not know and no one responded to wait until it breaks down. (Page 27)

Mid-Market & Large Business Workshops

Milton Hydro conducted the Innovative survey of Mid-Market and Large Business Customers (General Service over 50 kW) following a presentation by Milton Hydro to this customer group. The purpose of this presentation and survey was to provide these customers with some education about their local distribution system, and then to gather their feedback on Milton Hydro's proposed investments in the Application. The General Service >50 kW customers were invited to attend through an email from Milton Hydro's President and CEO. The presentation was held in Milton on June 17th, 2015. A total of 14 people representing 10 General Service >50 kW customers attended this consultation session.

In the presentation to Mid-Market Large Business customers, Milton Hydro projected a 24.8% increase to the distribution portion or 1.4% of the total bill for the General Service 50 – 999 kW customers and 30.0% increase to the distribution portion or 1.13% of the total bill for the General Service 1000 – 4999 kW customers, based on its investment plans in the 2016 Application.

Results of the survey:

- Despite some hesitation, social acceptance of the proposed rate increase is very high; only one participant is in opposition. Three participants support the increase outright while ten participants don't like the increase but think the increase is necessary. One participant opposed the increase. (Page 38)

- The majority of customers at the consultation 11 out of 14 were satisfied with the service they receive from Milton Hydro. (Page 34)

- When asked what Milton Hydro might do to improve the number or duration of outages 7 responded to spend what is need to reduce unexpected outages while 5 felt Milton Hydro should spend to maintain the duration of unexpected outages with one respondent prepared to accept longer outages to reduce costs. (Page 36)

- All respondents agreed it was important (11) or somewhat important (3) for Milton Hydro to modernize the grid. (Page 36)

- Asked whether to replace distribution assets before they breakdown 12 out of 14 respondents agreed while 2 felt Milton Hydro should wait until they break down. (Page 37)

- Of the respondents participating 13 out of 14 felt Milton Hydro's investment plan is definitely or might be going in the right direction. 9Page 37)

Customer Telephone Surveys

Innovative conducted two random-digit dialing customer telephone surveys for Milton Hydro:

- A Residential Customer (RS) Survey was conducted among 504 respondents between June 17 and June 20, 2015. Respondents were randomly selected from a customer list provided by Milton Hydro (26,733 Residential records). A sample of 500 Residential customers is considered accurate to within ±4.4 percentage points, 19 times out of 20.

- A General Service Customer (GS <50 kW) Survey was conducted among 200 respondents between June 18 and June 30, 2015. Respondents were randomly selected from a customer list provided by Milton Hydro (2,142 GS<50 kW records). A sample of 200 GS<50 kW customers is considered accurate to within ±8.9 percentage points, 19 times out of 20

The Residential and GS<50 kW questionnaires were designed to simulate the journey that respondents to the online workbook and participants in the Customer Consultation Focus Groups experienced.

Results of the Telephone Surveys include:

- The majority (86%) of Residential customers (83% General Service) are satisfied with Milton Hydro's management of the distribution system; two-in-five (40%) are *very satisfied* (33% for General Service). Less than one-in-ten (9%) expressed dissatisfaction (15% for General Service). (Page 86-87)

- The two most common suggestions for improvement are shared by both Residential and General Service customers. The most commonly cited improvement was a reduction of rates (RS: 32%; GS: 18%), followed by a reduction of outages (RS: 6%; GS: 11%). (Page 88).

- Regardless, of whether or not their households or organizations were affected, customers were asked to rate their level of satisfaction with Milton Hydro's response to the storm. Seven-in-ten (69%) Residential customers indicated satisfaction. More than one third (37%) said they were *very satisfied*. Of the nearly six-in-ten (57%) General Service customers who were satisfied, 27% were *very satisfied* with Milton Hydro's response to the storm. (Page 94-95)

- In regards to improving service specifically during the ice storm, Residential and General Service customers are once again of the same opinion. The two most common suggestions were better communication (RS: 8%; GS: 4%) and faster response time (RS: 4%; GS: 9%). For Residential customers communication is more important than response time, while the reverse is true for General Service customers. (Page 96)

- More than half (54%) of Residential customers (46% for General Service) think Milton Hydro should spend what is needed to *maintain* the number of power outages and one-in-five (21%) think Milton Hydro should spend what is needed to *reduce* the number of power outages (26% General Service). (Page 101-102)

- More than half (56%) of Residential customers (53% General Service) feel that Milton Hydro should invest what it takes to replace the system's aging infrastructure, even if that results in an increase to their monthly bills. One-third (33%) feel that investment should be lowered to lessen the impact of any bill increase (33% General Service).

- When asked whether they think non-critical infrastructure should be replaced before or after it breaks down, the majority of Residential (70%) feel that equipment should be replaced before it breaks down. (68% for General Service).

- The majority (68%) of Residential customers support the proposed estimated rate increase, whether they support it outright (33%), or acknowledge it as a necessity (36%). One-quarter (25%) of Residential customers are opposed.

- Overall General Service customers support the proposed estimated rate increase to the same degree (68%) as Residential customers, however the proportion that supports it outright (37%) is slightly higher. Roughly three-in-ten customers acknowledge it as a necessity (32%), and 28% oppose the increase.

In all four survey cases customers, to some degree, were interested in conservation and demand management ("CDM") programs as a means of reducing their bills. Customers felt Milton Hydro should be doing more to support them with CDM programs.

Milton Hydro's Response to Customer Preferences

Through its comprehensive customer engagement activities which are summarized above, Milton Hydro has identified five key customer preferences. Below Milton Hydro has summarized how it takes each of those preferences into account in the operation of its business.

1. Affordable Electricity Costs

Milton Hydro regularly hears from its customers about the importance of affordable electricity. At the same time customers also ask for services and have an expectation that when they touch a switch the lights will come on.

When it comes to the impact on household finances and the bottom line, a number of customers indicate that their electricity bill has a significant impact:

- 57% of Residential customers agree that "The cost of my electricity bill has a major impact on my finances and requires I do without some other important priorities"

- While 64% of GS customers agree that "The cost of my electricity bill has a major impact on the bottom line of my organization and results in some important spending priorities and investments being put off"

Yet, at the same time, most claim to be able to pay more for electricity but have concerns about the impact a rate increase will have on others.

- 56% of Residential and 57% of GS customers agree that "I [my organization] can personally afford to pay more for electricity, but I am worried about the impact this will have on others [some of my suppliers and customers]"

Finally, a large majority support spending more to maintain the local distribution system for future generations.

- 75% of Residential and 69% of GS customers agree that "We should invest in our electricity system infrastructure now or we will end up paying more the longer we delay our system renewal"

Milton Hydro is proposing a Cost of Service Application that balances the needs for Customer Focus, Operational Effectiveness (safety and reliability), Public Policy Responsiveness and solid Financial Performance. The rate impact on the customer was always considered when budgeting future plans in order to be affordable for its customers while at the same time having the ability to provide a reliable distribution system and excellent customer service.

Milton Hydro is also actively looking for ways to find efficiencies and cost savings including automating work processes to decrease manual tasks, improving coordination and planning of capital projects and being prudent with staffing levels.

Milton Hydro is proposing stable capital and operating expenditures in this Application. This helps to smooth rates and avoid significant year over year changes.

2. Reliability of Service - Reduce or Maintain Current Level of Outages

When it comes to addressing power outages, a majority of Residential and GS customers want to see continued spending on upgrades and maintenance. Feedback regarding the Spending on the Number of Power Outages:

- The majority of Residential and General Service respondents think Milton Hydro should spend what is needed to reduce or at least maintain the number of power outages.

Feedback regarding Spending and the Length of Power Outages:

- Again the majority of Residential and General Service respondents think Milton Hydro should spend what is needed to either reduce or at least maintain the length of power outages

It is clear from the results of Milton Hydro's customer consultations that cost and reliability are foremost in the customer's mind. These customer priorities have been directly addressed in Milton Hydro's Distribution System Plan (DSP). Milton Hydro is investing in maintaining reliability of the system whether it is by renewal of deteriorating assets before they impact customer reliability or by smart technologies to more quickly identify outages, isolate the fault and restore power to affected areas. Milton Hydro continuously monitors and analyzes reliability data for performance issues. Analysis of fault location and cause identification allow investments, whether they are O&M or capital, to be focused directly on the problem areas. This is in line with the majority of customers surveyed that agree Milton Hydro should replace aging assets before failure and modernized its distribution system.

Milton Hydro is investing in technologies such as fault indicators and system monitors along with the increased use of the resulting reporting capabilities in order to provide more quantitative analysis in its planning and investment decision process.

All of these investments are focused on providing better service and controlling distribution costs.

3. Proactive Communications when there are Unplanned Outages

Customers identified a need for communication effectiveness during power outages. Milton Hydro recognized before this Application that improvements in this area were warranted. In 2014 Milton Hydro made investments in a number of areas including the rollout of Social Media ("Twitter") in response to the December 2013 ice storm and the acquisition and implementation of an integrated Outage Management System ("OMS").

Milton Hydro plans to go live on September 15, 2015 with a 24/7 outage phone number (1-844-NOHYDRO) that will be advertised as the phone number to call for all power outages. The Interactive Voice Response ("IVR") system will direct customers to hang up and dial the outage phone number. Milton Hydro's contracted answering service can provide up to ninety-nine dedicated phone lines and up to thirty agents during a power outage. The communications company will update the OMS system with customer calls.

Once the 'outage' information is confirmed as accurate by an operator in the Guelph Hydro Control Room the OMS map will be published on Milton Hydro's website and available to Milton Hydro customers and a Twitter message will be posted. As an example – if Milton Hydro is experiencing an outage, calls come in from customers which are logged in the OMS system and a map can then be generated based on the customer information and OMS algorithms. The control room operator authenticates the outage manually and the outage map and estimated restoration times are published. Milton Hydro plans to go live in 2015.

Milton Hydro has also developed a Crisis Communication Manual and is in the process of hiring a Communication Specialist in recognition of the importance of communicating with customers.

4. Continued Delivery of High Quality Services

The UtilityPULSE Survey in June 2014 stated "Almost all Milton Hydro customers are satisfied with the job the utility is doing at running the electricity distribution system. This pattern was consistent across all rate classes in all phases of the customer consultation." Milton Hydro works hard every day to provide high quality services that ensure the safe, reliable and affordable provision of electricity distribution services.

Milton Hydro benchmarks very well against Ontario averages on key customer service quality metrics:

Table 3 – Customer Survey

	Milton Hydro	Ontario
Deals professionally with customer problems	87%	78%
Pro-active in communicating changes and issues affecting customers	82%	73%
Quickly deals with issues that affect customers	84%	74%
Customer-focused and treats customers as if they are valued	82%	72%
Milton Hydro is a company that is easy to do business	86%	75%
Delivers on its service commitments to customers	87%	82%

Milton Hydro is planning to increase the current level of service with the hiring of a Communications Specialist. Milton Hydro has also signed an agreement with its answering service which has increase costs. Milton Hydro does not want to reduce or weaken the level of service provided to customers.

Future Activities

Many steps have been taken to create the foundation for future customer engagement particularly on the role of Milton Hydro serving its customers and the broader community.

The Innovative Report in **Appendix I – Customer Consultation Report**. states that customers "generally felt positive regarding the consultation process. Customers generally agreed that they learned valuable information regarding the services that Milton Hydro offers." This feedback is important for Milton Hydro and will continue to provide ongoing engagement to better inform customers of its plans.

Milton Hydro will continue its ongoing customer engagement activities and will continue to take customer preferences into consideration in its business planning.

Town of Milton and Region of Halton Consultation

As part of its ongoing processes Milton Hydro consults with both the Town of Milton and the Region of Halton on a regular basis. Consultation with these local governments takes on different forms depending on the nature of the issue; however the exchange of information resulting from the ongoing dialogue is critical to the long term plan of all three organizations. Examples of the consultation process include:

<u>Public Utilities Coordinating Committee (PUCC)</u>

A monthly event, PUCC meetings are used by stakeholders to review existing and proposed Right Of Way (ROW) projects. These projects may be stand-alone projects (such as a road widening to accommodate increasing traffic volumes) or a coordinated effort in response to some other driver (such as new infrastructure to accommodate a specific residential development). This group coordinates the various activities required by the member stakeholders to ensure effective project planning and construction phases. In addition to the local governments this groups includes representation from all other local utilities such as gas, cable and communication companies. This ensures that all ROW stakeholders are involved in a coordinate effort from project inception to project completion.

Draft Plan and Zoning Amendments

Milton Hydro receives regularly Draft Plan and Zoning Amendment proposals to provide comments where appropriate and to act as a notification of the status of future projects. Detailed in scope this process provides a formal communication protocol between the Town of Milton and MHDI on projects which are still in the approval stage.

Annual Consultation

As part of an ongoing cycle The Town of Milton and Region of Halton provide their latest project plans to Milton Hydro for incorporation into Milton Hydro's internal planning needs. These plans which are available annually (or longer) include:

- Specific development plans and projects and their proposed timing
- Infrastructure plans – scope and timing of road widening's, water & sewer and other infrastructure works
- Official Plans – Regional and Town Official Plans

Specific Consultation

In addition to the cyclical consultation processes described above Milton Hydro often consults with the local municipalities on an issue specific basis. This may take the form of a group meeting or a telephone discussion. Examples of this include queries from the Town's Economic Development Department regarding Milton Hydro's ability to accommodate large customers at a specific location or discussion with the municipalities regarding Milton Hydro's ability to respond to special events such as the Pan Am and Parapan Am Games. More typical are the many one to one meetings Milton Hydro has with the municipal governments and their consultants regarding specific infrastructure related projects. As a growing community these types of projects are a major component of the focus within the Town of Milton and impact Milton Hydro's DSP.

Impact on DSP

Milton Hydro's DSP has been informed and partially shaped by the consultation with the Town of Milton and Region of Halton. MHDI has incorporated both infrastructure plans (see **Appendix B – Road Works**) and development projections (see growth projection in **Figure 1** to **Figure 5** and the Halton Region Official Plan link in **Appendix A**) into its proposed budget within the System Access category of the capital budget for the duration of the forecast period.

Development Community Consultation

As previously indicated the Town of Milton is expecting to see continual development and growth through to 2031. As indicated above Milton Hydro regularly consults with the municipal governments about the projected level of growth, however Milton Hydro also consults directly with the development community about their needs. Milton Hydro consults with the Development Community in the following ways:

Official Plans

While the Region and Town's Official Plans are not formally a Development Community document it does provide an overview of the long term servicing requirements within the Town of Milton by development phase. Official Plans are the official development guide and enable additional consultation to take place regarding staging and specific project milestones. Milton Hydro uses this information in combination with more project specific data to help formulate a response within the DSP.

Draft Plan Circulations and Approvals

This process provides additional subdivision specific information during the subdivision approval process. In addition to allowing Milton Hydro to comment on subdivision plans this process ensures there is a continual flow of information regarding specific subdivision developments.

Developer Plans

Milton Hydro has reached out to the Development Community and asked for specific subdivision development plans within the larger development areas. Although not all developers were able to accommodate MHDI's request, the response did provide additional insight into the timing of subdivision supply requirements and the number of individual connections projected by the developer.

Developer Consultation

As required Milton Hydro will consult with the development community on specific development related issues. These issues can range from financial obligations under Milton Hydro's Conditions of Service and the OEB's Distribution System Code to technical specifications for new subdivision installations. These discussions can be in the form of personal meetings or email correspondence. As an example Milton Hydro has met with different developers to review the responsibilities associated with subdivision maintenance periods once the subdivision is energized.

Project Specific Details

These discussions tend to yield the most benefits for subdivision specific projects. Dependent on the project timing these discussions can be initiated by both the development community and Milton Hydro. The ultimate goal of these discussions is to ensure both Milton Hydro and the developer are meeting their respective obligations and deliverables to ensure the subdivision is energized on time and the individual residences are connected on schedule. Issues ranging from temporary subdivision supply points to servicing layouts are discussed at this point.

Impact on DSP

Milton Hydro's DSP has incorporated the Development Community's input into the preparation of the DSP. Taken in conjunction with the municipal input, the aggregate outcome of the consultation process provides a more robust picture of the needs associated with the Development Community in Milton. On a practical level the DSP reflects the Development Community's input in the budgetary provisions incorporates into the DSP. In 2016 Milton Hydro has allocated approximately $3.8 million ($1.8 million after capital contributions) for subdivision developments. This is typical of the proposed investment for the forecast period.

Hydro One Consultation

Hydro One is the transmitter suppling Milton Hydro's service area. Milton Hydro receives power from four Hydro One supply points. Most of Milton Hydro's interactions with Hydro One are related to operational issues relating to Hydro One supply points. The notable exception to this is MHDI's and Hydro One's joint participation in the GTA West Region (Group 1) Integrated Regional Resource Plan (IRRP). In addition to Hydro One, the IRRP consultation process included the following regional distributors:

- Burlington Hydro Inc.
- Enersource Hydro Mississauga Inc.
- Halton Hills Hydro Inc.
- Hydro One Brampton Networks Inc.
- Hydro One Networks Inc.
- Oakville Hydro Electricity Distribution Inc.

The IRRP process was led by the Ontario Power Authority (OPA), now the Electricity System Operator (IESO), and the final results are discussed in **Final deliverables of the Regional Planning process (5.2.2 b)**.

On an operating basis Milton Hydro meets with Hydro One twice per year in Hydro One hosted distributor sessions:

Large Customer Conference

The Large Customer Conference provides an opportunity for an exchange of information between the transmitter and local utilities. The session provides an opportunity to review system concerns, pending changes to the transmission system and the possible impact on local distributors.

Hydro One Customer Conference to Discuss the Annual Outage Plan

This provides an opportunity to coordinate any outage requirements and therefore minimize interruptions and multiple switching operations.

Daily Operations

On a continual basis Milton Hydro coordinates system requirements with Hydro One. This ranges from form of daily operational needs to information exchanges at the system planning level.

Impact on DSP

There is no impact on Milton Hydro's DSP from consultation with Hydro One regarding daily operational matters. See **Final deliverables of the Regional Planning process (5.2.2 b)** for results of the IRRP process.

Oakville Hydro Consultation

In addition to the four Hydro One supply points that deliver power to Milton Hydro, Oakville Hydro also supplies power to Milton Hydro from the Oakville Hydro owned Glenorchy MTS.

On a daily basis Milton Hydro coordinates all operational activities at Glenorchy MTS through Oakville Hydro. On a weekly basis Oakville Hydro provides Milton Hydro operational measures associated with the supply from Glenorchy MTS.

On an ongoing basis Milton Hydro provides any relevant information regarding projected loads and operational changes and solicits feedback to confirm acceptance of any proposed system changes or resolve any concerns those changes may generate.

Impact on DSP

For the forecast period there is no impact on Milton Hydro's DSP arising from the consultation with Oakville Hydro.

Independent Electricity System Operator Consultation

Milton Hydro has consulted with the Independent Electricity System Operator (IESO) in two significant areas the GTA West Region (Group 1) Integrated Regional Resource Plan (IRRP) and Conservation and Demand Management (CDM).

For the results of the GTA West Region (Group 1) Integrated Regional Resource Plan (IRRP) See **Final deliverables of the Regional Planning process (5.2.2 b)**

Conservation and Demand Management

Milton Hydro actively offered the IESO Province-Wide Conservation and Demand Management (CDM) programs from 2011 to 2014. Milton Hydro has now transitioned to the new 2015 – 2020 Conservation First framework.

Milton Hydro continues to consult with its stakeholders including customers, consultants, other distributors and the IESO in an effort to effectively promote and deliver the CDM programs.

Impact on DSP

Milton Hydro continues to plan its system based on a number of factors captured within the System Access, System Renewal and System Service categories. Milton Hydro's plan is driven by the needs associated with the applicable OEB categories which in turn can be affected by factors such as development timing and economic conditions, there is no identifiable impact of CDM on Milton Hydro's DSP.

b. Final deliverables of the Regional Planning process (5.2.2 b)

where a final deliverable of the Regional Planning Process is available, the final deliverable; where a final deliverable is expected but not available at the time of filing, information indicating:

- **the role of the distributor in the consultation;**
- **the status of the consultation process; and**
- **where applicable the expected date(s) on which final deliverables are expected to be issued.**

Regional Planning

Regional Planning is conducted as per the OEB framework outlined in the Transmission System Code and Distribution System code. For planning purposes, Milton Hydro is in the GTA West region (Group 1). Milton Hydro is also embedded in the Kitchener-Waterloo-Cambridge-Guelph Region.

Within the GTA West region (Group 1), the other service providers in this region are:

- Burlington Hydro Inc.
- Enersource Hydro Mississauga Inc.
- Halton Hills Hydro Inc.
- Hydro One Brampton Networks Inc.
- Hydro One Networks Inc.
- Oakville Hydro Electricity Distribution Inc.

The GTA West region has been divided into 2 sub-regions; the Northwest Sub-Region and the Southwest Sub-Region. Milton Hydro is in both the Northwest Sub-Region and Southern Sub-Region.

Northwest Sub-Region

Planning activities for the Northwest Sub-Region are led by the IESO/OPA and were underway prior to the introduction of the OEB's new structured planning process and as such some of the initial published documents differ from those required under the OEB process. Separate reports for screening and scoping were not explicitly developed as required under the new OEB structured planning process.

Terms of Reference for the planning activities were initiated in 2012 and completed in 2013. The Terms of Reference include screening and scoping information for the region.

The final deliverable of the Regional Planning consultation process is the development of an Integrated Regional Resource Plan (IRRP) to meet supply needs of specific pockets of the GTA West - Northwest Sub-Region at various time horizons. The study integrates load growth projections, bulk system needs, relevant community plans, FIT and other generation uptake, as well as local constraints to ensure that system adequacy needs arising from assessment of projected load growth are appropriately captured.

The completed Integrated Regional Resource Plan (IRRP) dated April 28, 2015 considers all options to address electricity supply needs in the GTA West – Northwest Sub-Region over the next 20 years. A link to the Northwest GTA sub-region Integrated Regional Resource Plan (IRRP) has been included in **Appendix A – Document Links**. A copy of the Hydro One planning status letter has been included in **Appendix G – Regional Planning Status Letter**.

The IRRP findings include a need for new transformation facilities to service MHDI load growth by 2020. The overall impact of the IRRP, from all regions, on the DSP is discussed at the end of this section.

Below, **Figure 8** shows the Northwest Sub-Region.

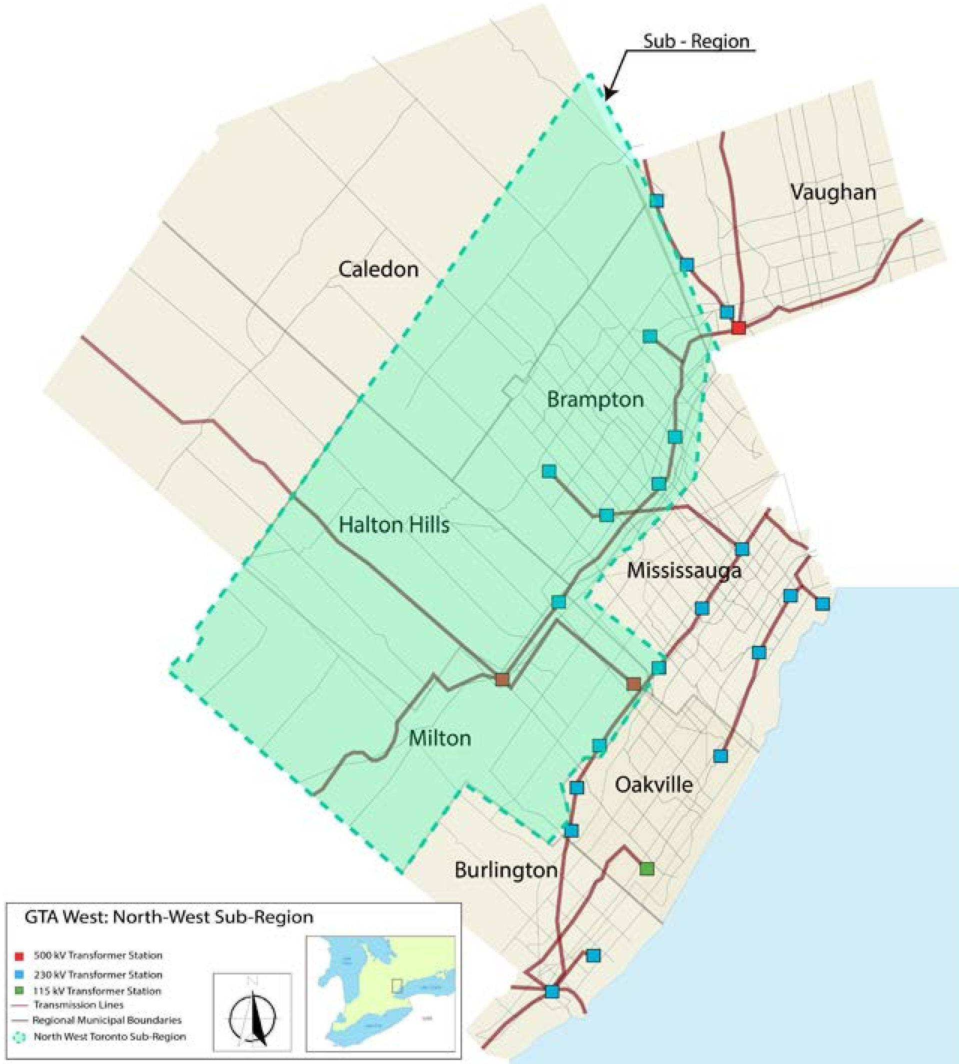


Figure 8 – GTA West – Northwest Sub-Region

Southern Sub-Region

Planning activities for this sub-region were undertaken as per the OEB Regional Planning framework.

Needs screening activities were led by Hydro One. A Needs Screening report was completed by Hydro One in May 2014.

Scoping Assessment activities were led by the IESO/OPA. A Scoping Assessment was completed in September 2014. Two major categories of needs were identified for the GTA West Southern Sub-Region: Capacity, and Load Restoration. The Capacity issues are limited to Enersource and a bulk system planning study is being conducted by the IESO for the West GTA to address the Load Restoration concern. Based on the review neither issue impacts Milton Hydro's DSP.

A copy of the Hydro One planning status letter has been included in **Appendix G – Regional Planning Status Letter**.

Below, Figure 9 shows the Southern Sub-region.

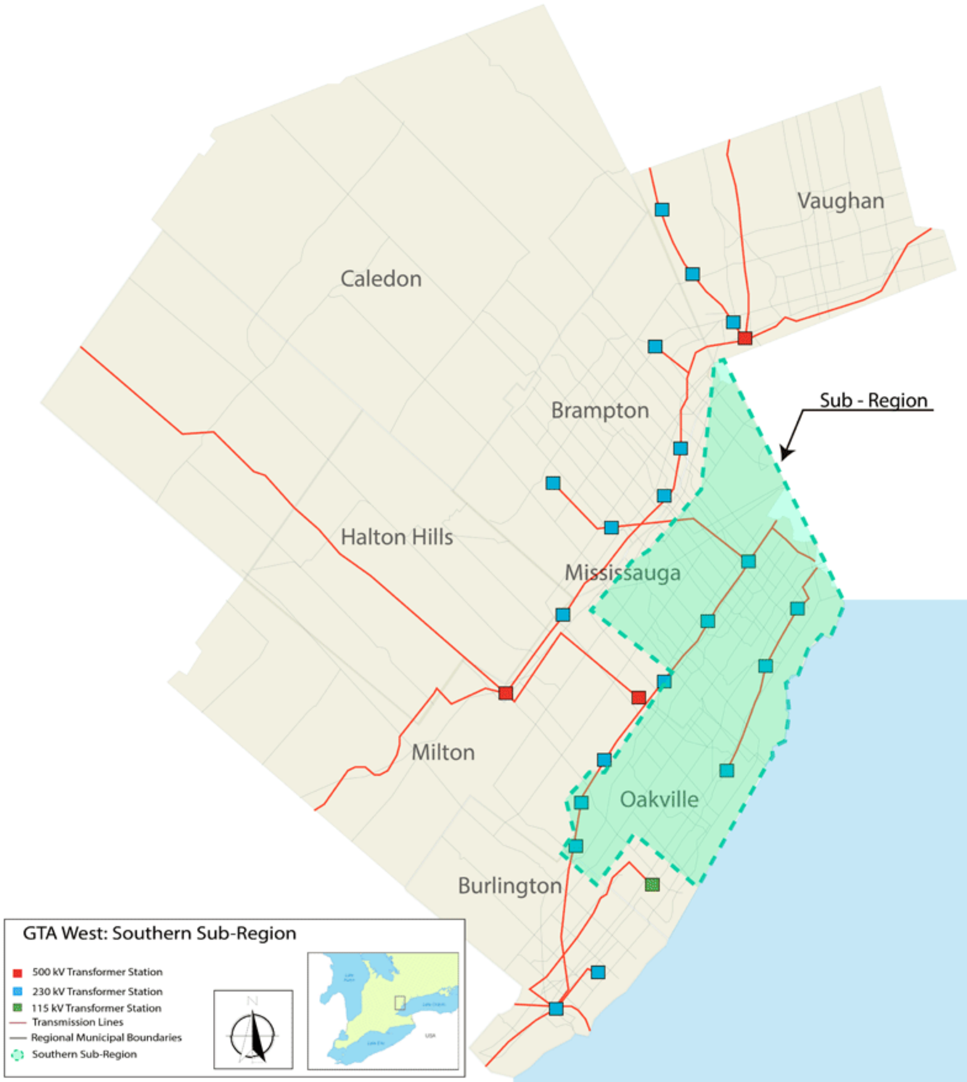


Figure 9 – GTA West – Southern Sub-Region

Kitchener-Waterloo-Cambridge-Guelph Integrated Regional Resource Plan

Milton Hydro is an embedded LDC served by Fergus TS which is located in the Kitchener-Waterloo-Cambridge-Guelph (KWCG) Region. A link to the Northwest KWCG IRRP has been included in **Appendix A – Document Links**.

Two transmission projects have been identified in this region to address the near- and medium-term needs in this region: the first being the Guelph Area Transmission Reinforcement (GATR) project, and the second being the installation of switches on circuits M20D and M21D. Execution of the first project is already underway while the second in the project development phase.

One component of the GATR project involves the installation of two load interrupter switches on 230 kV circuits D6V/D7V at Guelph North Junction. The switches will minimize the impact of interruptions to

Milton Hydro customers in the event of the loss of both circuits D6V and D7V. The investments associated with the GATR project are proposed as a network pool cost, and there is no impact to Milton Hydro's DSP. A copy of the Hydro One planning status letter has been included in **Appendix G – Regional Planning Status Letter**.

Impact on DSP

As described above the Northwest Sub-Region IRRP findings include a need for new transformation facilities to service MHDI load growth by 2020, the final year of Milton Hydro's forecast period. This will require a significant investment by Milton Hydro. Factors such as transformer station location and ownership (Milton Hydro or Hydro One), the loading schedule and transformer station design will impact the investment Milton Hydro will need to make in the transformer station. Due to the timing of the IRRP, the DSP preparation and the timing of the proposed transformer station Milton Hydro has not had an opportunity to investigate the options available for a new transformer station. As a result Milton Hydro has not yet proposed budgetary amount for the new station. Milton Hydro plans to explore the possible options available for a new transformer station and establish a preliminary budgetary target in 2016.

c. Comment Letter provided by the IESO in relation to REG investments (5.2.2 c)

the comment letter provided by the OPA in relation to REG investments included in the distributor's DS Plan, along with any written response to the letter from the distributor, if applicable.

Milton Hydro is not required to make any investments in support of renewable energy projects. No provisions for renewable energy investments have been included in the DSP. Milton Hydro's Renewable Energy Generation Plan and the IESO's Letter of Comment can be found in **Appendix H – IESO Comment Letter**. Based on the IESO's evaluation and response to Milton Hydro's Renewable Energy Generation Plan, no follow up response was required from Milton Hydro.

Performance Measurement for continuous improvement (5.2.3)

a. Metrics used to monitor distribution system planning performance (5.2.3 a)

identify and define the methods and measures (metrics) used to monitor distribution system planning process performance, providing for each a brief description of its purpose, form (e.g. formula if quantitative metric) and motivation (e.g. consumer, legislative, regulatory, corporate). These measures and metrics are expected to address, but need not be limited to:

• customer oriented performance (e.g. consumer bill impacts; reliability; power quality);

• cost efficiency and effectiveness with respect to planning quality and DS Plan implementation (e.g. physical and financial progress vs. plan; actual vs. planned cost of work completed); and

• asset and/or system operations performance.

MHDI has been and continues to be, focused on maintaining the adequacy, reliability and quality of service to its distribution customers. MHDI reviews plan performance on an ongoing basis through various mechanisms such as:

Customer Oriented Performance

- Biennial customer survey
- Service Reliability
- Power Quality
- O&M cost per customer/Customers per employee
- Bill impacts
- Billing Accuracy

Customer Oriented Performance - Biennial customer survey

In 2014, MHDI undertook its first customer satisfaction survey to obtain feedback on the overall value of service offered to customers. Customers were engaged to provide high level feedback on their perceptions of MHDI performance and where they think MHDI could improve service. The survey incorporated a number of performance metric aspects of OEB proceeding EB-2010-0379 Report of the Board: Scorecard Approach, specifically those related to Customer Satisfaction and Service Quality. This survey will be performed every two years going forward.

Customer Oriented Performance - Service Reliability

Milton Hydro monitors and relies on its monthly service quality and reliability indices (SQIs) as a means of measuring system performance. Milton Hydro's commitment to stakeholders is to ensure "highest standards of performance and business excellence for the safe, reliable provision of service". An SQI report, comparing the annual monthly results of SAIDI and SAIFI and the 5 year average, is prepared and presented at Milton Hydro's Board of Directors meetings.

Milton Hydro also tracks the cause of outages from which Milton Hydro is able to determine whether corrective action is required to prevent or reduce similar occurrences. This information is also presented at Milton Hydro's Board of Directors meetings.

Service reliability is monitored on a regular basis. All Trouble Reports are reviewed by the Operations Director. Meetings and discussions are held to review issues of an exceptional nature.

The previous 5 year rolling average for SAIDI, SAIFI and CAIDI (excluding loss of supply and major event days) are used as default targets for reliability performance expectations in the current year. SAIDI, SAIFI and CAIDI are defined as:

SAIDI = System Average Interruption Duration Index

$$= \frac{\text{Total Customer-Hours of Interruptions}}{\text{Total Customers Served}}$$

SAIFI = System Average Interruption Frequency Index

$$= \frac{\text{Total Customer Interruptions}}{\text{Total Customers Served}}$$

CAIDI = Customer Average Interruption Duration Index

$$= \frac{\text{SAIDI}}{\text{SAIFI}}$$

These indices provide MHDI with an annual measure of its service performance for internal benchmarking and for comparisons with other distributors. In accordance with Section 7.3.2 of the OEB Electricity Distribution Rate Handbook, MHDI records and reports SAIDI, SAIFI and CAIDI figures annually.

Outages are classified according to cause code, as per OEB reporting requirements, to provide further insight into the root cause of the outage.

Table 4 – Interruption Causes

Code	Cause of Interruption
0	**Unknown/Other** Customer interruptions with no apparent cause that contributed to the outage.
1	**Scheduled Outage** **Customer interruptions** due to the disconnection at a selected time for the purpose of construction or preventive maintenance.
2	**Loss of Supply** Customer interruptions due to problems associated with assets owned and/or operated by another party, and/or in the bulk electricity supply system. For this purpose, the bulk electricity supply system is distinguished from the distributor's system based on ownership demarcation.
3	**Tree Contacts** Customer interruptions caused by faults resulting from tree contact with energized circuits.
4	**Lightning** Customer interruptions due to lightning striking the distribution system, resulting in an insulation breakdown and/or flash-overs.
5	**Defective Equipment** Customer interruptions resulting from distributor equipment failures due to deterioration from age, incorrect maintenance, or imminent failures detected by maintenance.

6	**Adverse Weather** Customer interruptions resulting from rain, ice storms, snow, winds, extreme temperatures, freezing rain, frost, or other extreme weather conditions (exclusive of Code 3 and Code 4 events).
7	**Adverse Environment** Customer interruptions due to distributor equipment being subject to abnormal environments, such as salt spray, industrial contamination, humidity, corrosion, vibration, fire, or flowing.
8	**Human Element** Customer interruptions due to the interface of distributor staff with the distribution system.
9	**Foreign Interference** Customer interruptions beyond the control of the distributor, such as those caused by animals, vehicles, dig-ins, vandalism, sabotage, and foreign objects.

Tracking outage performance by cause code can provide valuable information on specific outage causes that need to be addressed to improve negative trending. As with the reliability indices, the past 5 year historical performance range is used as a target and results outside this range indicate positive or negative trending. The 5 year average in each cause code is used as a minimum target for the current year.

Customer Oriented Performance - Power Quality

Milton Hydro monitors system level power quality issues and responds to customer specific concerns.

System Level Power Quality

At the system level Milton Hydro monitors primary system voltages to ensure that values are in compliance with Canadian Standards Association (CSA) standard C235-83. At the system level Milton Hydro coordinates system values with Hydro One and Oakville Hydro to ensure that the power quality at Milton Hydro's five supply points (four Hydro One supply points and one Oakville Hydro supply point) are in compliance with the applicable standards.

In addition to the system level voltages, and as described above, Milton Hydro monitors SAIDI, SAIFI and CAIDI. An annual measure of its service performance these measures are used for internal benchmarking and for comparisons with other distributors.

Customer Specific Power Quality

Normal Voltage Levels - As with the system voltages Milton Hydro designs its secondary system to meet the applicable CSA C235-83 voltage standards. In particular the secondary distribution system is designed to deliver voltages at the customer Service Entrance within the Normal Operating range. In situations where the operating voltage levels violate the CSA standard, Milton Hydro will investigate to determine the cause of the voltage issue and resolve the problem. If the voltage problem is a result of Milton Hydro owned equipment Milton Hydro assumes the responsibility for correcting the issue. If the voltage problem is result of the customers owned equipment or installation Milton Hydro will supports the customer's efforts to identify and resolve the issue.

Customer Specific Power Quality – Milton Hydro responds to customer specific power quality issues on an as required basis. Power quality issues can range from momentary under and over (transient) voltages to harmonic related problems. These issues are typically separate from issues associated with normal operating voltage levels. When a customer complains about a power quality issue Milton Hydro will investigate the concern with the ultimate goal of identifying the issue and responding to the customers concerns. Where appropriate Milton Hydro will install a power quality meter at the customer service entrance to help identify and quantify the issue. Should the power quality issue be a result of Milton Hydro's system, Milton Hydro will resolve the issue, however it has been Milton Hydro's experience that most customer specific transient voltage concerns are a result of customer equipment or the customer's electrical infrastructure. Issues ranging from undersized secondary cables to compressor induced voltage dips are examples of issues that have been identified by Milton Hydro. Once the issue is identified Milton Hydro will consult with the customer to ensure there is a common understanding regarding the source of the problem and, where appropriate help determine next steps.

<u>Customer Oriented Performance - O&M cost per customer/Customers per employee</u>

MHDI monitors their O&M cost per customer and customers per employee relative to other LDC's and uses it as a reference when reviewing the Operating budget. Specifically MHDI tracks and compares their OM&A cost per customer to the Ontario Industry averages of LDCs. It is MHDI Board's "intent" that MHDI strive to be cost efficient with respect to OM&A expenses relative to the other Region of Halton LDCs and Milton Hydro's Peer Group as defined in the Pacific Economic Group ("PEG") study as Mid-Size GTA Medium-High & High Undergrounding (Benchmarking the Costs of Ontario Power Distributors, March 20, 2008.

<u>Customer Oriented Performance - Bill impacts</u>

Over 80% of a residential customer's bill is due to factors (i.e. Electricity, Transmission, Debt Retirement, Market Charges, Global Adjustment, etc.) outside the control of the LDC. Notwithstanding that, surveys indicate that it is the overall cost of the bill, not the individual components, that are of concern to the customer.

<u>Customer Oriented Performance - Billing Accuracy</u>

In the 2014 MHDI survey, billing related issues have been identified as a key identifier of customer satisfaction. Billing is one of the principal forms of communication with the customer. Starting in October in 2014, MHDI began tracking billing accuracy statistics as per OEB requirements.

<u>Cost Efficiency and Effectiveness</u>

- Planning Quality
- DS Plan Implementation

<u>Cost Efficiency and Effectiveness – Planning Quality</u>

MHDI considers a number of factors when assessing distribution system Planning Quality including

- o Plan Input
- o Plan Management
- o Budgetary Performance

Plan Input – In addition to third party consultation (see Description of the consultations (5.2.2 a)) Milton Hydro consults internally, obtaining feedback from field crews to ensure technical plans incorporate input from an operational perspective. Every job is jointly reviewed by the designing technologist and an operations supervisor.

Plan Management – During the budget year joint by-weekly meetings are held with Engineering and Operations staff to review the project schedule. At these meetings project updates/schedules are reviewed and any required program spending/scheduling corrections are addressed. Milton Hydro is using Microsoft Project as an informal project management tool. Microsoft Project is being considered as a means of formally tracking the status of projects throughout the budget year on a trial basis. In conjunctions with these meetings the Directors of Engineering and Operations review the budget to reconcile and manage any required program changes. .

Budgetary Performance - As a tool to assist in managing the capital budget, Milton Hydro has implemented an intranet based, project specific capital spend summary which is updated daily. In 2016 Milton Hydro will implement a similar report tool for the operating budget. As mentioned previously the Directors of Engineering and Operations review the budget vs actual capital and operating spending on a regular basis at both the project and program spending level.

At a corporate capital and operating expenditures regularly to ensure they are on budget and on schedule. Expenditure summary reports are provided to the MHDI Board on a periodic basis.

Going forward Milton Hydro will be monitoring and reporting budgetary performance based on the new OEB categories, System Access, System Renewal, System Service and General Plant.

<u>Cost Efficiency and Effectiveness – DS Plan Implementation</u>

Milton Hydro is looking at formal means to capture DS Implementation during the forecast period. Milton Hydro will be considering its options for reporting the DS Plan Implementation with the revised reporting commencing in 2016.

<u>Asset/System Operations Performance</u>

- Safety
- Reg. 22/04
- System Losses
- Renewed Regulatory Framework for Electricity (“RRFE”) Performance Scorecard
- Feeder Loading
- System Losses
- Renewed Regulatory Framework for Electricity (“RRFE”) Performance Scorecard

<u>Asset/System Operations Performance – Safety</u>

Maintaining a high level of employee safety is a key corporate objective. Safety is monitored on an ongoing basis. Monthly summaries of incidents and accidents are provided to the MHDI Executive and the Board (see **Appendix C – Safety Report**). Any safety related incidents would require additional information and discussion at the Board level as warranted by the specific incident.

MHDI has engaged Springboard Management Inc. to provide safety reporting services. Safety issues are documented on Springboards proprietary software and emails are distributed for information purposes. E-mails provide a brief commentary and access to the Springboard Management Inc. website to get more detailed information.

Asset/System Operations Performance – Reg. 22/04

As with every other Ontario distributor, MHDI's design, construction, inspection and maintenance practices are audited on a yearly basis as required by Ontario Regulation 22/04. The utility can be deemed to be in one of three performance categories:

1. In compliance
2. Needs Improvement
3. Not in compliance

MHDI's target is to remain in compliance in all categories being audited.

Asset/System Operations Performance – Feeder Loading

As part of MHDI design and operating philosophy, the 27.6kV, 13.8kV and 8.32kV feeders are loaded to 50% of capacity to ensure that contingency situations can be addressed with the minimal amount of service interruption to the customer. Feeder loading is collected and reviewed on a monthly basis. The feeder loading indicates the effectiveness of MHDI's asset utilization planning and contingency capability.

Asset/System Operations Performance – System Losses

System design and operation is managed such that system losses are maintained within OEB thresholds as defined in the OEB Practices Relating to Management of System Losses. Losses are monitored to ensure that the OEB threshold of 5% is not exceeded.

Asset/System Operations Performance – Renewed Regulatory Framework for Electricity ("RRFE") Performance Scorecard

The OEB RRFE performance scorecard is reviewed annually to ensure performance trending aligns with regulatory targets. Underperformance trending would result in measures being taken to realign performance trending with expectations.

b. Summary of historical performance (5.2.3 b)

provide a summary of performance and performance trends over the historical period using the methods and measures (metrics/targets) identified and described above. This summary must include historical period data on: 1) all interruptions; and 2) all interruptions excluding loss of supply' for a) the distribution system average interruption frequency index; b) system average interruption duration index; and c) customer average interruption duration index.

Where performance assessments indicate marked adverse deviations from trend or targets (including any established in a previously filed DS Plan), provide a brief explanation and refer to these instances individually when responding to provision 'c)'

Customer Oriented Performance

- Biennial customer survey
- Service Reliability
- Power Quality
- O&M cost per customer/Customers per employee
- Bill impacts
- Billing Accuracy

Customer Oriented Performance - Biennial customer survey

Key customer survey results for 2014, that provide National and Ontario comparisons, are shown in **Table 5** below:

Table 5 – 2014 Customer Survey Results Comparison

	Milton Rating	National Average	Ontario Average
Customer Care	B+	B+	B
Company Image	A	B+	B+
Management Operations	A	A	A
Customer Centric Engagement Index (CCEI)	83%	79%	76%
Customer Experience Performance Index (CEPI)	86%	82%	79%
Outage Problems	34%	47%	49%
Billing Problems	11%	16%	25%

The survey results indicate a positive customer perception of MHDI in key performance categories. In 2014, MHDI scored higher than National and Ontario benchmarks in almost all of the performance categories. High CCEI and CEPI numbers reflect customer satisfaction in their relationship with MHDI. Future surveys will provide additional data for trending purposes.

Customer Oriented Performance - Service Reliability

The history of all interruptions categorized by interruptions excluding loss of supply and interruptions excluding loss of supply and planned outages are shown in **Table 6** below:

Table 6 – MHDI Interruption history

Year	All interruptions	All interruptions excluding loss of supply	All Interruptions excluding loss of supply and planned outages
2010	284	275	190
2011	312	304	199
2012	260	253	181
2013	402	384	312
2014	424	419	198
5 year avg.	**336**	**327**	**216**

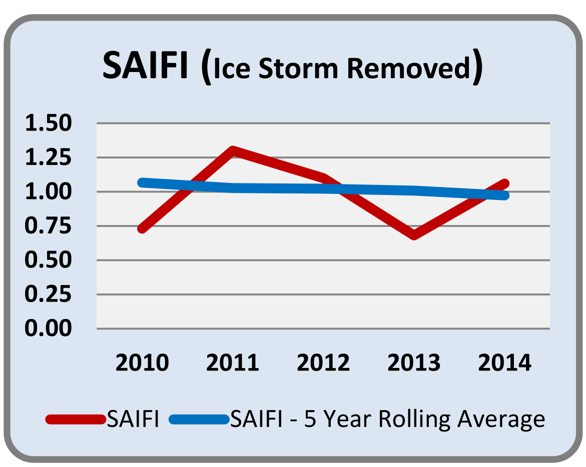
Service reliability statistics are compiled monthly (see sample reliability statistics summary in **Appendix D - Reliability**).

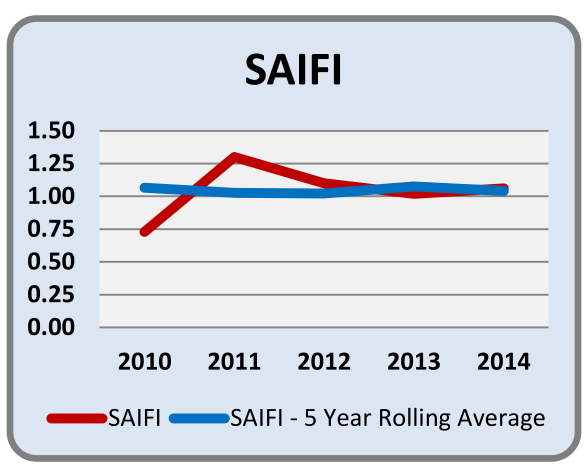
Total interruptions increased significantly in 2013 and 2014 compared to previous years primarily due to the storm activity including the December 2013 ice storm and a planned switch replacement program. Close to half the 2014 outages were scheduled outages.

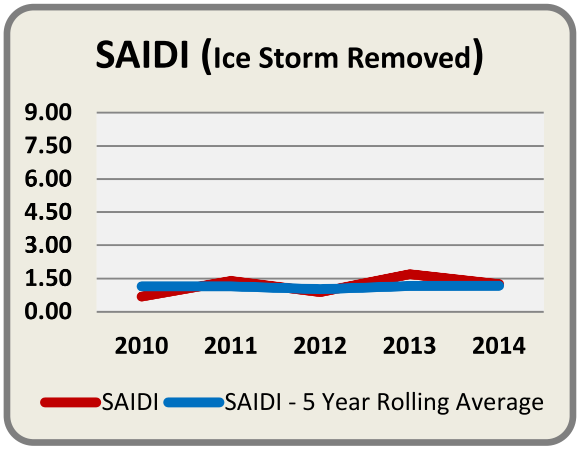
MHDI's SAIFI, SAIDI and CAIDI statistics for the 2010 – 2014 historical period are shown in **Table 7** below:

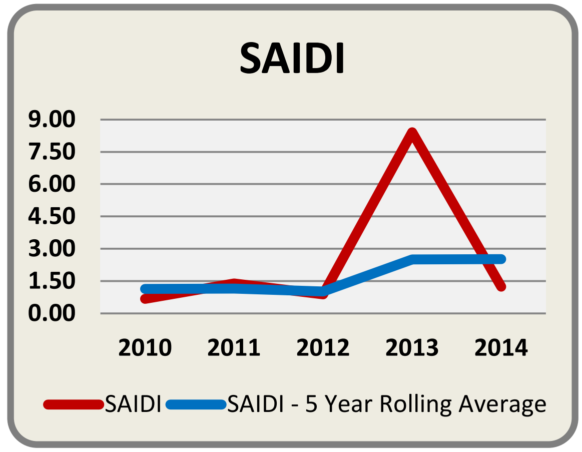
Table 7 – 2010 – 2014 Reliability Statistics

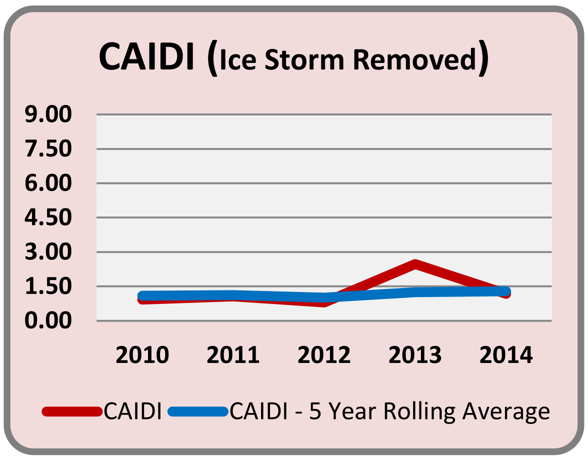
Year	SAIFI	SAIDI	CAIDI
2010	0.73	0.68	0.93
2011	1.30	1.39	1.07
2012	1.10	0.88	0.80
2013	1.02	8.41	8.29
2014	1.06	1.24	1.17
5 year avg.	**1.04**	**2.52**	**2.45**

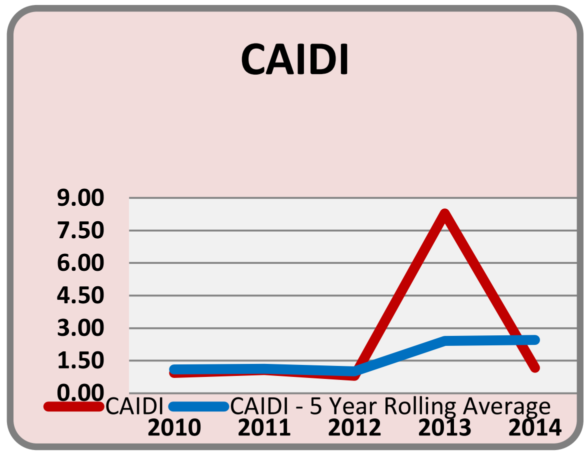












The reliability statistics indicate a relatively stable trending over the historical period except for 2013. The reliability numbers in 2013 are due to the effects of the 2013 ice storm that swept across southern Ontario in December 2013. If we exclude the December 2013 Ice Storm (Major Event Day) from the 2013 reliability statistics, the revised numbers are shown in **Table 8** below:

Table 8 – 2013 Reliability statistics – Ice Storm impact excluded

Year	SAIFI	SAIDI	CAIDI
2013	0.68	1.69	2.48
5 year avg.	**0.97**	**1.18**	**1.29**

The impact of the ice storm has been discussed in detail in Milton Hydro's 2014 Z-Factor application (EB-2003-0014) to the OEB.

Using the December 2013 Ice Storm excluded statistics, SAIFI has been averaging approximately 0.97 over the historical period. This equates to a MHDI customer experiencing an outage once every year.

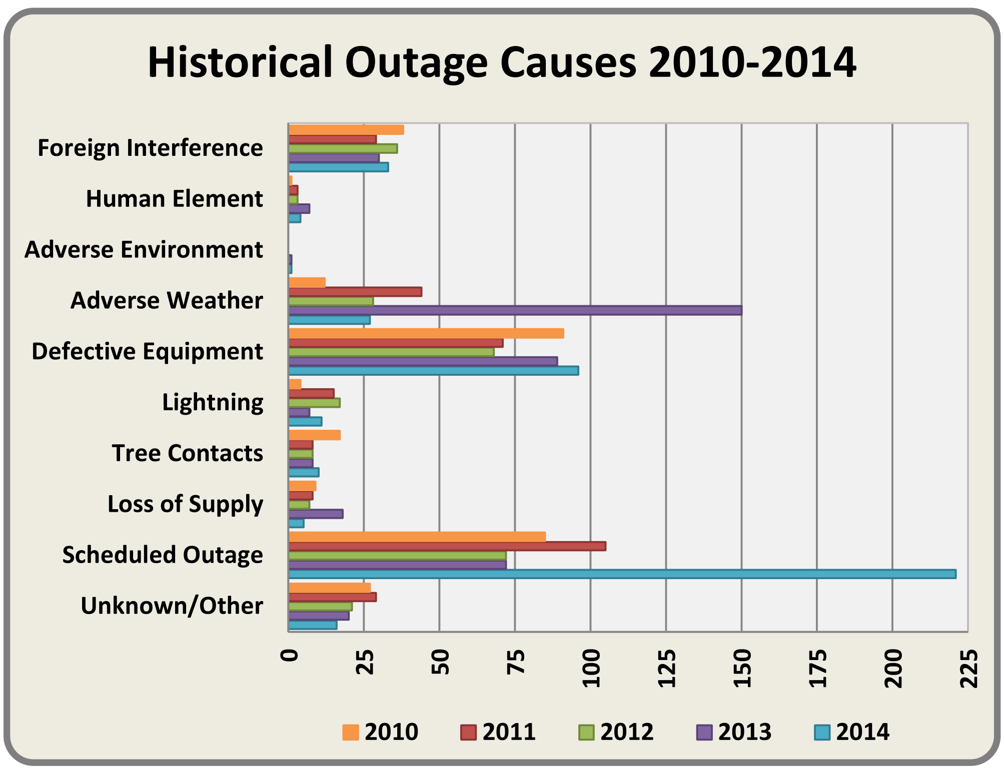
Using the December 2013 Ice Storm excluded statistics, SAIDI has been averaging approximately 1.18 over the historical period. This equates to a MHDI average of 71 minutes of outages per customer.

Using the December 2013 Ice Storm excluded statistics, CAIDI has been averaging approximately 1.29 over the historical period. This equates to a MHDI customer experiencing an average duration outage of 77 minutes.

Historical outage causes are listed in **Table 9** below:

Table 9 – 2010 – 2014 Outage Causes

Code	Primary Cause	2010	2011	2012	2013	2014	Average
0	Unknown/Other	27	29	21	20	16	23
1	Scheduled Outage	85	105	72	72	221	111
2	Loss of Supply	9	8	7	18	5	9
3	Tree Contacts	17	8	8	8	10	10
4	Lightning	4	15	17	7	11	11
5	Defective Equipment	91	71	68	89	96	83
6	Adverse Weather	12	44	28	150	27	52
7	Adverse Environment	0	0	0	1	1	0
8	Human Element	1	3	3	7	4	4
9	Foreign Interference	38	29	36	30	33	33



Excluding cause numbers attributed to the 2013 Ice Storm, most trends have been stable in the historical period. In 2014 MHDI proactively replaced porcelain switches. A 2010 ESA serious incident report study identified porcelain as a "know equipment weakness" and contributor to hazards affecting public safety. For the scheduled outages in 2014, 94 outages were due to porcelain switch replacements. There were less than 5 scheduled outages for this in previous years. Adverse weather trends indicate that climate change issues are increasingly impacting the ability of the distribution system to delivery power reliably. Code 3 and 5 causes are mitigated through effective maintenance programs and renewal programs for any assets that are at end of useful life.

Customer Oriented Performance - Power Quality

Milton Hydro captures and reports system level reliability as discussed in **Summary of historical performance (5.2.3 b)** and further documented in **Appendix D - Reliability**).

Milton Hydro responds to all power quality issue reported by individual customers. Historically Milton Hydro has not captured statistics detailing the number of power quality issues investigated on an annual basis. Milton Hydro will implement a tracking mechanism to capture power quality issues arising during the forecast period.

Customer Oriented Performance - O&MA cost per customer/customers per employee

MHDI's OM&A cost per customer were slightly higher than the peer group averages during the historical period. The peer group consists of 12 LDCs including MHDI. Statistics for the 2010 – 2014 period are shown in **Table 10** below:

Table 10 – 2010 – 2014 LDC peer group OM&A/customer comparators

Year	2010	2011	2012	2013
MHDI OM&A/customer	$192	$210	$209	$248
LDC peer group average	$192	$203	$234	$245
MHDI peer group ranking	6th	8th	3rd	7th

MHDI's customers per employee numbers were superior to the peer group averages during the historical period. Statistics for the 2010 – 2014 period are shown in **Table 11** below:

Table 11 – 2010 – 2014 LDC peer group customers/employee comparators

Year	2010	2011	2012	2013
MHDI customers/employee	649	663	673	655
LDC peer group average	578	564	555	553
MHDI peer group ranking	3rd	3rd	3rd	3rd

Milton Hydro also compares its performance to the year book results for all distributors. In 2013, the first year of comparison when all distributors should have made the OEB mandatory MIFRS changes, Milton Hydro ranked nineteenth out of seventy-three distributors for OM&A per customer, and tenth out of sixtynine distributors for the number of customers served per employee (four distributors do not report or report one employee in the year book statistics).

In the Pacific Economics Group ("PEG") Report to the OEB on the 2013 Benchmarking Update, Milton Hydro's efficiency stretch factor improved from 0.40% to 0.15% for Milton Hydro's 2015 IRM Rate Application.

Customer Oriented Performance - Bill impacts

MHDI's rebased and harmonized rates through a Cost of Service application in 2011. IRM applications were filed resulting in modest rate adjustments for 2012, 2013 and 2014 that were deemed reasonable by the OEB Board. Milton Hydro deferred its COS application by one year from 2015 to 2016 and is seeking 2015 rates based on 4^{th} Generation IRM principles. Annual rate impacts are shown in **Table 12** below:

Table 12 – Annual Customer Rate Impacts

Class	2011	2012	2013	2014
Residential	+0.74%	+0.88%	+0.48%	+1.4%
GS < 50kW	+2.34%	+0.88%	+0.48%	+1.4%
GS > 50kW	+1.82%	+0.88%	+0.48%	+1.4%

Customer oriented performance - Billing Accuracy

MHDI has received general feedback on billing accuracy through the 2014 customer survey. 2014 statistics are shown in **Table 13** below:

Table 13 - Respondents indicating that they had a billing problem last 12 months

	Milton	National	Ontario
2014	11%	16%	25%

Accuracy issues would be related to incorrect information or miscalculated balances. MHDI performance exceeds Ontario and National performance levels. MHDI has begun collecting billing accuracy statistics in October 2014. These statistics will be reported on MHDI annual performance scorecard published by the OEB.

Cost Efficiency and Effectiveness

- Planning Quality
- DS Plan Implementation

Planning Quality

Currently Milton Hydro does not capture Planning Quality data on a historical basis. Milton Hydro will be looking at possible tracking mechanisms/tools to capture Planning Quality data during the forecast period, starting with 2016.

DS Plan Implementation

This is the first DS Plan Milton Hydro has submitted to the OEB. Milton Hydro will be looking at possible tracking mechanisms/tools to measure the DS Plan Implementation during the forecast period, starting with 2016.

Asset/System Operations Performance

- Safety
- Reg. 22/04
- System Losses
- Renewed Regulatory Framework for Electricity ("RRFE") Performance Scorecard
- Feeder Loading
- System Losses
- Renewed Regulatory Framework for Electricity ("RRFE") Performance Scorecard

Asset/System Operations Performance – Safety

There was one minor lost time injury over the historical period of the DSP. This and all other safety related issues encountered (e.g. slips in adverse weather) are considered controllable through continued education, awareness and application of safe work practices.

Asset/System Operations Performance – Reg. 22/04

During the 2010 – 2014 historical period, MHDI has achieved compliance in this portion of the audit. Issues noted as "Needs Improvement" are addressed to ensure that they are "In Compliance" for the following year audit. Exceptions to "In Compliance" audit findings are shown in **Table 14** below:

Table 14 – ESA Audit Results

Audit Year	Not in Compliance	Needs Improvement
2010	0	3
2011	0	2
2012	0	1
2013	0	1
2014	0	1

Asset/System Operations Performance – Feeder loading

The 27.6kV, 13.8kV and 8.32kV feeders loading is shown in section 5.3.2 d. 27.6kV feeder loadings average 95% of planning capacity (300amps). The 13.8kV and 8.32kV feeder loadings average 53% of planning capacity. In most cases there is considerable capacity on the 27.6kV feeder system to accommodate incremental load growth (e.g. EVs). All 13.8kV feeders will gradually be replaced by 27.6kV fed infrastructure.

Asset/System Operations Performance – System Losses

MHDI system losses over the historical period are shown in **Table 15** below:

Table 15 – MHDI System Losses

2010	2011	2012	2013	2014
3.21%	3.36%	3.60%	2.00%	3.87%

Losses were trending in the 3.2% – 3.9% range over the historical period and within the OEB 5% threshold.

RRFE Performance Scorecard

The RRFE performance scorecard metrics indicate that MHDI is effective in achieving the RRFE performance outcomes. Most measures show historical performance is within target values. MHDI is currently ranked in Group 2 with respect to Efficiency Assessment (stretch factor = 0.15%).

c. Effect of performance information on the plan (5.2.3 c)

explain how this information has affected the DS Plan (e.g. objectives; investment priorities; expected outcomes) and has been used to continuously improve the asset management and capital expenditure planning process.

The results of the performance measures are a contributing factor in determining the direction and investment priorities of the Distribution System Plan.

Customer Survey Results

MHDI conducted its first customer satisfaction survey in 2014. The survey show that the customers are very satisfied with MHDI's performance. MHDI reviews the survey results to determine if adjustments to corporate programs and strategies are warranted. Any significant change to program/strategies would affect the DSP. The 2014 top 3 suggestions to improve service to customers are:

1. Better prices/lower rates
2. Better online presence
3. Better communication with customers

To improve online presence and customer communication, a Communication Specialist position (1 FTE) will be created. The Communication Specialist will support the development of MHDI's website information and social media management.

Customer oriented performance - Service Reliability

The reliability indices indicate that equipment failure and adverse weather are two of the key contributors to customer outages. While the number of equipment failure related outages has been fairly steady over the historical period, there has been an increase in the frequency of adverse weather related outages. Climate change models indicate that adverse weather conditions are expected to increase putting additional strain on the design and operation of the distribution system. This highlights the need for MHDI to continue to manage its assets through its Asset Management Plan and investigate the impact of climate change on the design and operation of the distribution system.

To progressively improve outage response and restoration, through the period of the DSP, MHDI will continue the development of its Smart Grid. Installation of automated switches and fault sensing devices communicating through MHDI's WiMAX system will mitigate the impact of outages.

Outage cause codes and the December 2013 ice storm indicate that increased vegetation management, requires attention in the DSP. Vegetation management spending has been increased from $330k to $500k annually during the period of the DSP. Failure to address system renewal needs will affect long term system performance and not address the customer values identified through the customer survey process.

MHDI has contracted Control Room operations to Guelph Hydro. The availability of 24/7 Control Room presence is expected to provide for more timely after-hours outage response and reduced power restoration times.

Customer oriented performance - Billing Accuracy

Survey results support customer perceptions that MHDI billing accuracy is relatively high compared to Ontario and National levels. At this time there are no specific investment needs in the DSP to improve billing accuracy. Compilation of annual billing accuracy statistics over the initial period of the DSP will indicate if investments to improving billing accuracy are warranted. If so, then this may change investment priorities in the later years of the DSP.

Cost Efficiency and Effectiveness – Program spending

The DSP has been prepared in consideration that program spending must be achievable with the resources that are available (i.e. suppliers, design services, municipal approvals, contract labour, vehicles, etc.) in a timely manner. Programs are to be completed in the year they are budgeted.

Asset/System Operations Performance – Safety

MHDI continues to promote continued education, awareness and application of safe work practices and as such safety continues to play a key role in project prioritization.

Asset/System Operations Performance – Reg. 22/04

MHDI continues to demonstrate prudent compliance with O. Reg. 22/04 and as such ESA compliance continues to play a key role in project prioritization.

Asset/System Operations Performance – Feeder loading

Existing performance is within planning capacity thresholds and as such there is no specific impact on the DSP.

Asset/System Operations Performance – System Losses

Existing performance is within performance targets and as such there is no specific impact on the DSP.

RRFE Performance Scorecard

The RRFE Performance Scorecard supports the key plan objectives of maintaining current reliability levels and low overall cost to the customer during the forecast period. The current scorecard is shown in **Table 16** below:

Table 16 – Milton Hydro RRFE Performance Scorecard

Performance Outcomes	Performance Categories	Measures	2009	2010	2011	2012	2013	Trend	Industry Target	MHDI specific Target 2015
Customer focus	Service Quality	New Residential Services Connected On Time (DSC	93.6%	99.1%	99.0%	98.6%	98.0%		90%	
		Scheduled Appointments Met On Time	100%	100%	100%	100%	99.7%		90%	
		Telephone Calls Answered On Time	70.0%	79.0%	76.8%	82.6%	74.5%		65%	
	Customer Satisfaction	First Contact Resolution							-	-
		Billing Accuracy	N/A	N/A	N/A	N/A	N/A	N/A	98%	98%
		Customer Satisfaction Survey Results	N/A	N/A	N/A	N/A	N/A	N/A	A	A
Operational Effectiveness	Safety	Public Safety							-	-
	System Reliability	Average Number of Hours that Power to a Customer is Interrupted	1.02	0.55	1.05	0.81	7.94			At least within 0.55 – 1.05
		Average Number of Times that Power to a Customer is Interrupted	0.86	0.40	1.12	1.05	0.99			At least within 0.40 – 1.12
	Asset Management	Distribution System Plan Implementation Progress (% completed)	N/A	N/A	N/A	N/A	N/A	N/A	-	100%
	Cost Control	Efficiency Assessment				3	2			
		Total Cost per Customer	$665	$659	$676	$644	$654		-	
		Total Cost per Km of Line	$20,977	$20,478	$21,698	$21,166	$22,402		-	-
Public Policy Responsiveness	Conservation and Demand Management	Net Annual Peak Demand Savings (% of target achieved)			13.0%	7.0%	9.0%		-	8.05MW
		Net Cumulative Energy Savings (% of target achieved)			49.0%	60.0%	72.9%		-	33.50GWh
	Connection of Renewable Generation	Renewable Generation Connection Impact Assessments Completed On Time (%)			100%	100%			OR 326/09	100
		New Micro-embedded Generation Facilities Connected On Time					100%		90%	
Financial Performance	Financial Ratios	Liquidity: Current Ratio	1.25	1.64	1.56	1.59	1.68		-	-
		Leverage: Total Debt	0.53	0.72	0.79	0.90	0.92		-	-
		Profitability: Regulatory Return on Equity – Deemed			9.58%	9.58%	9.58%		-	-
		Profitability: Regulatory Return on Equity – Achieved			4.90%	8.15%	10.6%		-	-

Asset Management Process (5.3)

As noted in the Introduction, a distributor's asset management process is the systematic approach used to plan and optimize ongoing capital and operating and maintenance expenditures on its distribution system and general plant. The purpose of the information requirements set out in this section 5.3 is to provide the Board and stakeholders with an understanding of the distributor's asset management process, and the direct links between the process and the expenditure decisions that comprise the distributor's capital investment plan.

This section of the Distribution System Plan (DSP) provides a high level overview of MHDI's asset management process.

MHDI's asset management process is a systematic approach used to plan and optimize ongoing capital and operating and maintenance expenditures on the distribution system and general plant. Electricity distributors are capital intensive in nature and prudent capital investments and maintenance plans are essential to ensure the sustainability of the distribution network.

MHDI has developed an Asset Management Plan which outlines the capital and operating expenditures necessary to ensure that Milton Hydro continues to provide high standards for the safe, reliable supply of electricity at the lowest cost.

The 2016 – 2020 Asset Management Plan provides for:

- Replacement and voltage conversion of old plant
- Construction of new plant required to service the Town of Milton's rapid growth
- Town of Milton and Region of Halton road work
- Inspection and testing of existing plant
- Maintenance of the high standard of service to the Town of Milton Hydro residents and businesses

Milton Hydro's Asset Management Plan has been developed with due regard to the different Acts, Regulations, Codes and Guidelines and the continual updating of good utility practice to ensure the needs of the Town of Milton and Milton Hydro customers are met. A copy of the 2016 – 2020 Asset Management Plan is in **Appendix J 2016 – 2020 Asset Management Plan**.

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Asset Management Process overview (5.3.1)

This section provides the Board and stakeholders with a high level overview of the information filed on a distributor's asset management process, including key elements of the process that have informed the preparation of the distributor's capital expenditure plan and therefore are referred to in response to requirements for more detailed information supporting the overall capital expenditure plan, budget allocations to categories of investments, or material projects/activities proposed for recovery in rates. The information provided should include but need not be limited to:

a. Asset Management Objectives (5.3.1 a)

a description of the distributor's asset management objectives and related corporate goals, and the relationships between them; where applicable, show and explain how the distributor ranks asset management objectives for the purpose of prioritizing investments;

MHDI's asset management objectives align with MHDI's corporate goals which are stated in MHDI's Commitment to Stakeholders which is shown in **Appendix E – Commitment to Stakeholders**:

> "We will adhere to the highest standards for the safe, reliable delivery of services. We will protect our environment, our employees, our customers and the people of the communities in which we do business.
>
> We will strengthen our business by making reliability, safety, health and environmental issues an integral part of all business activities and by continuously striving to align our businesses with an appropriate balancing of stakeholder expectations."

The key outcome is delivering reliable, safe service through balanced management of stakeholder expectations.

MHDI's Commitment to Stakeholders forms the foundation for MHDI's Asset Management Objectives which are:

- Construct, maintain and operate all assets in a safe manner to meet a goal of zero injuries, illnesses and incidents
- Design, build, operate and maintain all MHDI facilities and transportation equipment so they are reliable, safe, and acceptable to local communities.
- MHDI asset management plans align with stakeholder needs and expectations
- Timely completion of annual planning, inspecting, reporting and implementation activities
- Achieve the 2015 – 2020 CDM targets allocated to MHDI
- Minimize waste generation, emissions and impact on the environment through prudent asset management and operation.

The Corporate and Asset Management objectives form the high-level philosophy framework for MHDI's investment program and are implicitly embedded in MHDI's capital investment planning process and maintenance program. MHDI has identified six asset management objectives that align with the corporate objectives.

The table below shows the linkages between RRFE Outcomes, Corporate Objectives and Asset Management objectives.

Table 17 – RRFE Outcomes -Corporate Objectives-Asset Management Linkage

RRFE Outcomes	Corporate Objectives	Asset Management Objectives	AM Objective Measure	AM Objective Target
Operational Effectiveness	Safety	Construct, maintain and operate all assets in a safe manner to meet a goal of zero injuries, illnesses and incidents	1. Workplace Injuries, illness, incidents 2. ESA Non-Compliance	1. Zero 2. Zero (Max 1 Needs Improvement)
Operational Effectiveness	Reliability in electricity delivery	Design, build, operate and maintain all MHDI facilities and transportation equipment so they are reliable, safe, and acceptable to local communities.	1.SAIDI 2.SAIFI	1.SAIDI within range of past 5 year performance 2.SAIFI within range of past 5 year performance
Customer Focus	Stakeholder/MHDI alignment	MHDI asset management plans align with stakeholder needs and expectations	Customer Survey	Customer survey results => previous year for : a) Customer Care b) Company Image c) Mgmt Operations
Financial Performance	Financial integrity and accountability	Timely completion of annual planning, inspecting, reporting and implementation activities	1.Investment spending 2. Investment scheduling	1. OM&A expenditure +/- 5% to estimate; Capital expenditure +/- 5% to estimate 2.=>80% annual projects/ programs completed on time
Public Policy Responsiveness	Conservation of Energy	Achieve the 2015 – 2020 CDM targets allocated to MHDI	1. Energy (GWH) saved through annual CDM programs	1. 45.36 GWh saved by 2020
Public Policy Responsiveness	Environmental stewardship	Minimize waste generation and emissions through prudent asset management and operation.	1. Reportable spills to the MOE	1. Zero reportable spills to MOE from Code 5 events

An integral part of achieving the asset management objectives is a maintenance program to ensure system performance is sustained during the entire asset service life. MHDI has in place inspection and routine maintenance programs to achieve this.

b. Asset Management process components (5.3.1 b)

information regarding the components (inputs/outputs) of the asset management process used to prepare a capital expenditure plan, identify and briefly explain the data sets, primary process steps, and information flows used by the distributor to identify, select, prioritize and/or pace investments; e.g.

- **asset register**
- **asset condition assessment**
- **asset capacity utilization/constraint assessment**
- **historical period data on customer interruptions caused by equipment failure**
- **reliability-based 'worst performing feeder' information and analysis**
- **reliability risk/consequence of failure analyses.**

Use of a flowchart illustration accompanied by explanatory text is recommended.

MHDI's Asset Management planning cycle is detailed in the flowchart shown below.

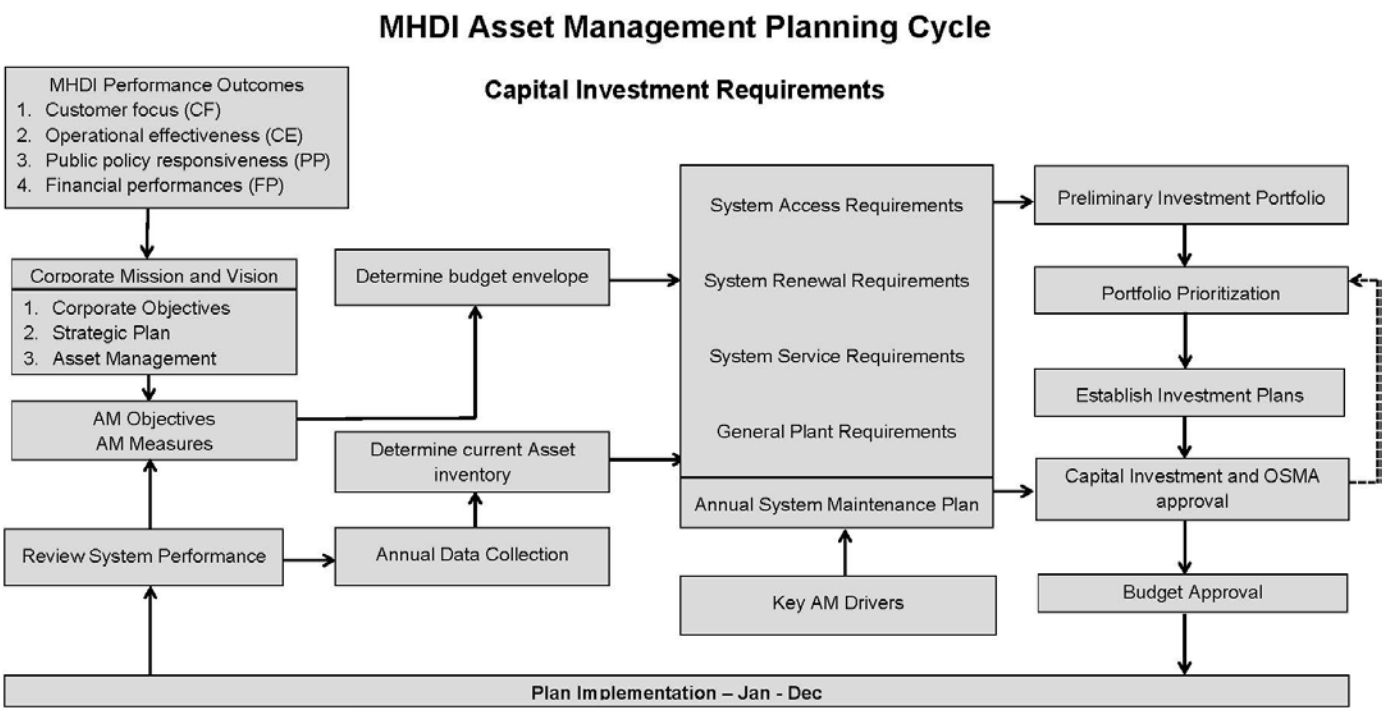


Figure 10 – MHDI Asset Management Planning Cycle

The Asset Management planning cycle is a process designed to achieve MHDI's Asset Management Objectives. The process is a cyclical one that begins with a review of system performance and whether current performance meets MHDI's asset management objectives. Asset performance information and annual asset data collection is used to update MHDI's asset register for the investment planning part of the cycle. Performance data normally reflects the previous year's data. Data collection is ongoing as new/replaced assets are added to the system.

The investment planning part of the asset management process begins with updated asset register information and a proposed budget envelope. The proposed budget envelope consists of capital and operating funds determined by:

1. Financial stability considerations (financing, depreciation stability, debt/equity ratio, etc.)
2. Historical spending considerations
3. Regulatory/government directives/policy
4. Resource capability considerations
5. Investment drivers(asset state; sustainable level of service; critical assets; design and operations)

The proposed budget envelope provides the required information on organizational financial capability for ranking, prioritizing and pacing of investment projects that result in the achievement of the four RRFE performance outcomes.

With the proposed budget envelope as a guide, investment planning then proceeds. Capital Investments are place in one of the four investment categories:

1. System Access
2. System Renewal
3. System Service
4. General Plant

Investment needs are determined by the key asset management process drivers that lead to the achievement of the asset management objectives. MHDI's asset management process identifies four key fundamental drivers of investment:

1. The current state of the assets
2. Assets critical to performance
3. MHDI's desired level of service and mandated deliverables
4. MHDI's design and operating philosophies
5. From this a preliminary portfolio of capital investments is produced.

Non-discretionary capital projects are automatically included as per scheduled need. In general, non-discretionary projects are defined as:

- New/modified customer service connections (System Access)
- Road authority required plant relocation projects (System Access)
- Mandated service obligations (System Access)
- Renewable energy projects (System Access)
- Safety related projects (System Service)
- Emergency replacement of failed equipment (System Renewal)

The investment schedule may indicate that to optimize system performance, the capital envelope may require adjustment – defer, accelerate, remove or add projects. Reasons for adjustment consider factors such as:

- Project interdependencies
- Resource (labour, material, etc.) availability
- Cost and benefit uncertainties/risks
- Capital availability

In this case a revised capital budget envelope may be considered and the capital investment would be re-evaluated to optimize system performance.

Following final investment plan approval, the asset management process would then proceed to the plan implementation stage. Investment plans would be executed and resulting system performance outcomes would be collected and reviewed starting the asset management planning cycle over again.

Asset Register

The asset management process has at its foundation an asset register where asset information is held. For MHDI, the asset register is not a single information source but is composed of the GIS, electronic files and paper files.

MHDI's distribution assets were historically recorded on a CableCad system. In 2012, MHDI procured an ESRI based Geographic Information System ("GIS") system. Conversion of asset data from the CableCad system to the GIS has been completed with primary and secondary assets information transferred to the ESRI GIS. The CableCAD system will be discontinued once the remaining civil information is transferred to the GIS and all quality assurance checks have been completed.

MHDI staff will use AutoCAD to design plant layouts and develop drawings for field installation purposes. Completed "as-built" AutoCAD drawing information will be converted into the GIS.

The GIS asset data is used to help establish inspection cycles and track asset information. As assets are replaced, pole and transformer details are captured in detail on the GIS. Other assets' details are captured as part of installation drawings and project documentation. MHDI's plans to migrate additional asset specific information to the ESRI GIS system will enhance its asset management efforts through greater accessibility to asset specific details.

All inspection results are captured electronically, inspection results are either scanned into Milton Hydro's document management system or stored as part of some other software package; as an example, an Access database is used to document pole testing results. Milton Hydro also utilizes its mapping capabilities to geographically define maintenance programs resulting in an ability to generate printouts for field inspectors or contractors.

The GIS is intended to be the primary geospatial asset register component for all non-general plant assets. The GIS system is used for mapping, representing and displaying distribution plant information for capital and maintenance activities, information necessary to provide underground utility locates, and for design and construction activities including new capital projects and customer connections. At the present time, the GIS holds only primary voltage asset data (pole location, age, circuit voltage and phases) but draws (or will) on other sources of asset information as a means of extracting and displaying asset details. Other asset attribute information is held in other databanks (electronic and paper). See below for example of potential pole attributes information:

Pole attributes information

- Class
- Material Type
- Species
- Treatment Type
- Height
- Supplier
- Purchase Order number
- Cost
- Date Stamp
- Date Installed
- Work Order Number
- Ownership
- Pole Number
- Framing Type
- Attachments (e.g. joint use, etc.)
- Inspection history dates
- Inspection reports
- Maintenance history

Table 18 – MHDI Asset Register

Asset Register			
Asset register component	**Owner/Location**	**Asset Information**	**Asset Information format**
GIS	-Engineering	- Pole location - Pole age - Circuit conductor size, voltage and phase(s) - OH switch, transformer, switchgear location and nomenclature	- electronic data
MS Access Pole database	-Engineering	-Pole test results -Pole and conductor inspections -Pole condition -Pole attachments -OH/padmount transformer inspection & visual condition -OH switch inspection & visual condition	- electronic data
MS Excel spreadsheet	-Engineering	-Padmount switchgear inspection	-electronic data
Northstar database	-Operations (Stores)	-transformer data	- electronic data
Financial system	-Finance	- IFRS financial asset value - asset useful life studies	-paper reports, electronic database
	-Finance	- purchase history - installation history - removal history	-paper forms
ACA report	-Engineering	-annual asset condition assessment	-spreadsheet
Outage history	-Engineering	-SAIFI, SAIDI stats database	-paper format
Maintenance Records	-Engineering -Operations	-tx, swgr, poles, stns -	-paper/spreadsheet format
Inspection Records	-Engineering -Operations	- tx, swgr, poles, stns -	-paper/spreadsheet format
Asset utilization records	- Engineering	-stn, fdr loading	- spreadsheet format
General plant	-Operations -I/S -I/S -Finance -Finance	-Fleet history -computers -software -land -buildings	-paper/spreadsheet format

As can be seen, there is a significant amount of attribute information that can be collected from even the simplest of field assets. Going forward, the GIS will hold pertinent geospatial information on the asset including location, history, condition information, etc. The MHDI GIS is a new system and the long term plan is to have the GIS linked to databases containing all distribution plant information. General Plant assets (other than land and buildings) are non-geospatial assets and managed separately.

Asset Condition Assessment

Milton Hydro's asset condition assessments are based on field inspections, testing & maintenance programs, historical equipment information and equipment performance. Incorporating manufacturer's recommendations, industry best practices, historical findings and Milton Hydro's experience these programs are delivered by both in-house personnel and contract help. The result of these programs is asset condition information which is used to update the Asset Register. Milton Hydro also takes into consideration other areas of asset performance such as equipment vintage, past reliability performance and system impact. Assets that are inspected are rated and scheduled for maintenance, refurbishment, replacement or future inspections.

Table 19 – Minimum Inspection Requirements (OEB DSC Table C-1)

Major or Substantial Distribution Facility*	**Patrol**	**Patrol**
Distribution Transformers	**Urban**	**Rural**
Overhead	3	6
Submersible	3	6
Vault	3	6
Pad Mounted	3	6

Stations (see note below)	**Outdoor Open**	**Outdoor Enclosed**	**Indoor Enclosed**	**Outdoor Open**	**Outdoor Enclosed**	**Indoor Enclosed**
Transformer Station	1 month	1	1	6 month	1	1
Distribution Station	1 month	1	1	6 month	1	1
Customer Specific Substation	1	3	3	1	3	3

Lines and Associated Equipment		
Regulators	3	6
Switching and Protective Devices	3	6
Capacitors	3	6
Conductors and Cables		
Overhead	3	6
Underground	3	6
Submarine	3	6
Vegetation (see note below)	3	6
Poles	3	6
Civil Infrastructure	3	6

Milton Hydro's inspection and maintenance programs include:

OEB's Distribution System Code Minimum Inspection Requirements – Milton Hydro utilizes the inspection requirements detailed in Table C-1 of the Distribution System Code as a minimum inspection requirement. Reproduced above in **Table 19**, the minimum inspection requirements identifies the maximum intervals, in years, for visual patrols, which for most urban facilities is 3 years, rural facilities is 6 years and distribution stations one of 1 month, 6 months, 1 year or 3 years.

Table 20 – Milton Hydro Inspection Cycles

Major or Substantial Distribution Facility*	**Patrol**			**Patrol**		
Distribution Transformers	**Urban**			**Rural**		
Overhead	3			**3**		
Submersible	3			**3**		
Vault	3			**3**		
Pad Mounted	3			**3**		
Stations (see note below)	**Outdoor Open**	**Outdoor Enclosed**	**Indoor Enclosed**	**Outdoor Open**	**Outdoor Enclosed**	**Indoor Enclosed**
Transformer Station	1 month	1	1	**1 month**	1	1
Distribution Station	1 month	1	1	**1 month**	1	1
Customer Specific Substation	1	3	3	1	3	3
Lines and Associated Equipment						
Regulators	3			**3**		
Switching and Protective Devices	3			**3**		
Capacitors	3			**3**		
Conductors and Cables						
Overhead	3			**3**		
Underground	3			**3**		
Submarine	3			**3**		
Vegetation (see note below)	3			**3**		
Poles	3			**3**		
Civil Infrastructure	3			**3**		

As shown in **Table 20** Milton Hydro employs an inspection cycle that reduces inspection intervals in rural areas. In addition to fulfilling the OEB's cyclical inspection requirements, Milton Hydro's inspection process enables the identification and documentation of condition-related deficiencies, which, taken together with the subsequent analysis process, results in a framework that supports maintenance and capital expenditures for the various distribution assets.

In conjunction with inspection cycle Milton Hydro employs contractor inspectors to assess asset conditions in the following areas:

Pole Inspection and Testing – Milton Hydro employs contract inspectors to inspect and test poles on a 3 year cycle. The pole inspection cycle is document in the **Appendix J – 2016 – 2020 Asset Management Plan** (**Appendix H** and **Appendix I** within the asset management plan). Contract inspectors submit detailed inspection results that are used to plan pole replacements and assess pole conditions throughout Milton Hydro's service territory.

Overhead Distribution Inspection – Milton Hydro employs a contractor to inspect the overhead system and document the condition of the various assets associated with the overhead plant including transformers, guying, grounding and hardware. The entire overhead system is inspected on a 3 year cycle. See **Appendix J – 2016 – 2020 Asset Management Plan** (**Appendix B** within the asset management plan).

Infrared Inspections – Annually, Milton Hydro employs an infrared contractor to inspect both the overhead distribution plant and pad mounted switchgear. A sample report is included in **Appendix J – 2016 – 2020 Asset Management Plan** (**Appendix F** within the asset management plan). Infrared inspections are used to identify electrical hot spots that may lead to asset failure and impact system reliability. Once a system weak spot is identified by the infrared inspection the appropriate remedial action, capital or maintenance, will be scheduled based on the severity of the issue.

Distribution Substation Inspection and Testing – Milton Hydro inspects its distribution substations on a monthly basis and contracts out substation testing and maintenance on an annual basis. As part of the annual contractor testing, Milton Hydro receives a detailed report for each substation transformer.

Asset Capacity Utilization / Constraint Assessment

Milton Hydro designs its distribution system utilizing best industry practices and adhering to all applicable standards. Specifically, Canadian Standards Association (CSA) standards play a significant role in designing the distribution system and ensuring safety and reliability provisions are incorporated into all designs.

On a planning basis Milton Hydro assess its distribution system asset capacity utilization by using historical loading data and system capacity & configuration data (as discussed in **Assessment of existing system capacity (5.3.2 d)**) to evaluate the status of the distribution system. Milton Hydro also uses CYME, system planning software that enables Milton Hydro to model the electrical distribution system and analyse system parameters such as feeder loading and voltage levels.

On a daily basis, Milton Hydro monitors its distribution system to ensure system capacities are not exceeded. Utilizing its SCADA system Milton Hydro is able to monitor distribution feeders at Transformer Stations on a real time basis. This enables Milton to anticipate possible system overloads and react to system emergencies in real time.

Historical Period Data on Customer Interruptions due to Equipment Failure

As reviewed in **Summary of historical performance (5.2.3 b)**, **Table 9 – 2010 – 2014 Outage Causes**, defective equipment, on average, accounted for 24.7% of all reliability events from 2010 – 2014. Milton Hydro keeps records of customer interruptions by cause code. The historical data on customer interruptions by cause code can be found in **Table 9**.

Worst Performing Feeder

Historically Milton Hydro has not tracked worst performing feeder statistics. Milton Hydro recognizes the importance of documenting this reliability measures and plans to capture this information starting in 2016.

Overview of Assets Managed (5.3.2)

Appropriate regulatory assessment of DS Plans requires an understanding of the scope and depth of the assets managed by a distributor. Distributors vary in terms of the types of assets managed (e.g. some own high voltage equipment; others do not). Detailed characteristics and data on the assets covered by the asset management process are to be filed, including but not necessarily limited to

a. Description of the distribution service area (5.3.2 a)

a description and explanation of the features of the distribution service area (e.g. urban/rural; temperate/extreme weather; underground/overhead; fast/slow economic growth) pertinent for asset management purposes, highlighting where applicable expectations for the evolution of these features over the forecast period that have affected elements of the DS Plan;

Figure 11 – 2013 Ice Storm Damage

As of December 31, 2014, MHDI served approximately 35,580 residential customers, 2,477 GS<50kW customers and 287 GS>50kW customers as well as several unmetered loads, approximately 9,599 street lights and 425 sentinel lights in service area of 371 square kilometers.

The MHDI service area has a humid continental climate (Köppen climate classification Dfb) with four distinct seasons featuring cold, somewhat snowy winters and warm summers. Precipitation is moderate and consistent in all seasons, although summers are a bit wetter than winter due to the moisture from the Gulf of Mexico and the Great Lakes.

Severe weather in the summer manifests itself mostly in the form of thunderstorms that can damage overhead distribution plant. In the winter, severe weather may consist of snow squalls, high winds and freezing rain. In 2013 a severe ice storm passed through the Milton Hydro service area resulting in downed trees and powerlines. At the height of the storm, approximately 15,000 Milton Hydro customers were without power and resulted in restoration costs in excess of $935,000 leading to a “Z” factor recovery application.

Milton Hydro is a mixed urban/rural utility with an expanding population and distribution system. The urban area comprises approximately 15% of the service territory while the rural area comprises the remaining 85% of the service territory.

MHDI is responsible for maintaining distribution and infrastructure assets deployed, including 549 kilometers of overhead lines and 416 kilometers of underground lines. A significant portion of these assets have been installed since 2001.

From 1991 to 2001, Milton Hydro had modest customer growth and related infrastructure investment. Since 2001, the Town of Milton has experienced extremely high growth and consistent with the pattern of growth in the community, Milton Hydro’s annual average investment in distribution plant also increased primarily to meet system access requirements.

Local growth will be a key driver of future investment needs. MHDI’s customer growth has averaged 6.1% annually since 2009. Milton is expected to continue to grow to a population of 147,400 in 2021. Milton’s current population exceeds 100,000. The Town of Milton has been identified as one of the Urban Growth Centres in the Greater Golden Horseshoe. Significant intensification growth around Milton is identified in both the 2012-2021 and 2021 – 2031 periods of Halton Region’s Official Plan.

There are no embedded utilities within Milton Hydro’s distribution service territory nor is Milton Hydro a host utility to other distributors.

Milton Hydro is bounded by:

- Hydro One Networks Inc. and Halton Hills Hydro to the North;
- Oakville Hydro Electricity Distribution Inc. & Burlington Hydro Inc. to the South.
- Halton Hills Hydro & Enersource Hydro Mississauga to the East;
- Hydro One Networks Inc. & Burlington Hydro Inc. to the West

MHDI receives bulk power from 5 wholesale delivery points owned by others and delivered primarily at 27.6kV (one feeder supplies MHDI at 44kV).

Hydro One transmission assets traverse Milton Hydro’s service area.

Map of the Milton Hydro service area is shown in **Figure 12** below.

Figure 12 – Milton Hydro Service Territory

b. System configuration (5.3.2 b)

a summary description of the system configuration, including length (km) of underground and overhead systems; number and length of circuits by voltage level; number and capacity of transformer stations;

Milton Hydro is supplied power from five transformer stations at 44kV and 27.6kV, four owned and operated by Hydro One Networks Inc. and one owned and operated by Oakville Hydro. The five wholesale delivery points as noted in **Table 21** below:

Table 21 – Milton Hydro Wholesale Delivery Points

Wholesale Delivery Point	Location	Allocated Capacity MW	Feeders	Voltage KV
Halton TS	JSP south of 4th Line	139.5	9	27.6
Palermo TS	Hwy 25	18.4	2	27.6
Fergus TS	6th Line & Hwy 7	2.0	1	44
Tremaine TS	Tremaine & 407	38.35	2	27.6
Glenorchy TS (Oakville Hydro Owned TS)	6th Line north of 407	40.0	2	27.6

MHDI is transmission connected at Halton TS and Tremaine TS.

While there are 18 large users (>500kVA service capacity) that take power directly from the 27.6kV feeders through customer owned substations, the majority of customers are served from Milton Hydro's 27.6kv distribution transformers and a smaller number are served from 13.8kV and 8.32kv distribution feeders emanating from municipal substations (MS). The 44kV is very limited (4km overhead) in MHDI service area and currently it only supplies MS6.

There are 4 municipal substations and 2 regulator facilities in the Milton Hydro service territory as shown in **Table 22** below:

Table 22 – Milton Hydro MS and Regulator facilities

Substation Number	Substation Address	Capacity	Transformer Sizes	Primary Voltage kV	Secondary Voltage kV	Feeders
MS #4	Derry Road W N/S	20 MVA	T1 10/13.3/16.6 MVA T2 10/13.3/16.6 MVA	27.6	13.8	3
MS #6	25 Side Road	5 MVA	T1 5 MVA	44	8.32	3
MS #7	5 Side Road	6 MVA	T1 6 MVA	27.6	8.32	1
MS #9	Second Line W/S	6 MVA	T1 6/8 MVA	27.6	8.32	3
MRS#7	5 Side Road	25 MVA Regulator	N/A	27.6	27.6	1
MRS#10	Bronte North of Main St	25 MVA Regulator	N/A	27.6	27.6	1

MS#4 will be decommissioned within the next few years as part of Milton Hydro's asset management plans to convert the area voltage to 27.6kV.

The 27.6kV feeder network is used to move the power to residential and small commercial neighbourhoods where it is transformed down, through local distribution transformation facilities, to user utilization levels of 120/240V, 600/347V and 120/208V.

Municipal substations take power at 27.6kV and transform it down to 13.8kV and 8.32kV. A network of 13.8kV and 8.32kV feeders is used to move the power to residential and small commercial neighbourhoods where it is again transformed down, through local distribution transformation facilities, to user utilization levels of 120/240V, 600/347V and 120/208V.

Total overhead and underground distribution circuitry length is shown in **Table 23** below:

Table 23 – Distribution Circuit Lengths

Distribution Circuit Lengths				
	13.8/8	27.6/16	8.32/4.8	Total
O/H km	69	325	155	549
U/G km	15	387	13	415
Total km	84	712	168	964

A significant amount of the underground 27.6kV circuitry is single phase distribution within residential subdivisions. Underground 13.8kV and 8.32kV circuits are limited to residential and rural areas and in declining amounts as the 13.8kV areas are converted to 27.6kV

Underground assets consist of pad-mount transformers, submersible transformers, transformer vaults and adjacent civil structures.

A schematic diagram of each of Milton Hydro's 44kV/27.6kV, 13.8kV and 8.32kV distribution systems is shown in **Figures 13, 14 and 15** below:

Figure 13 – 44kV and 27.6kV Distribution System

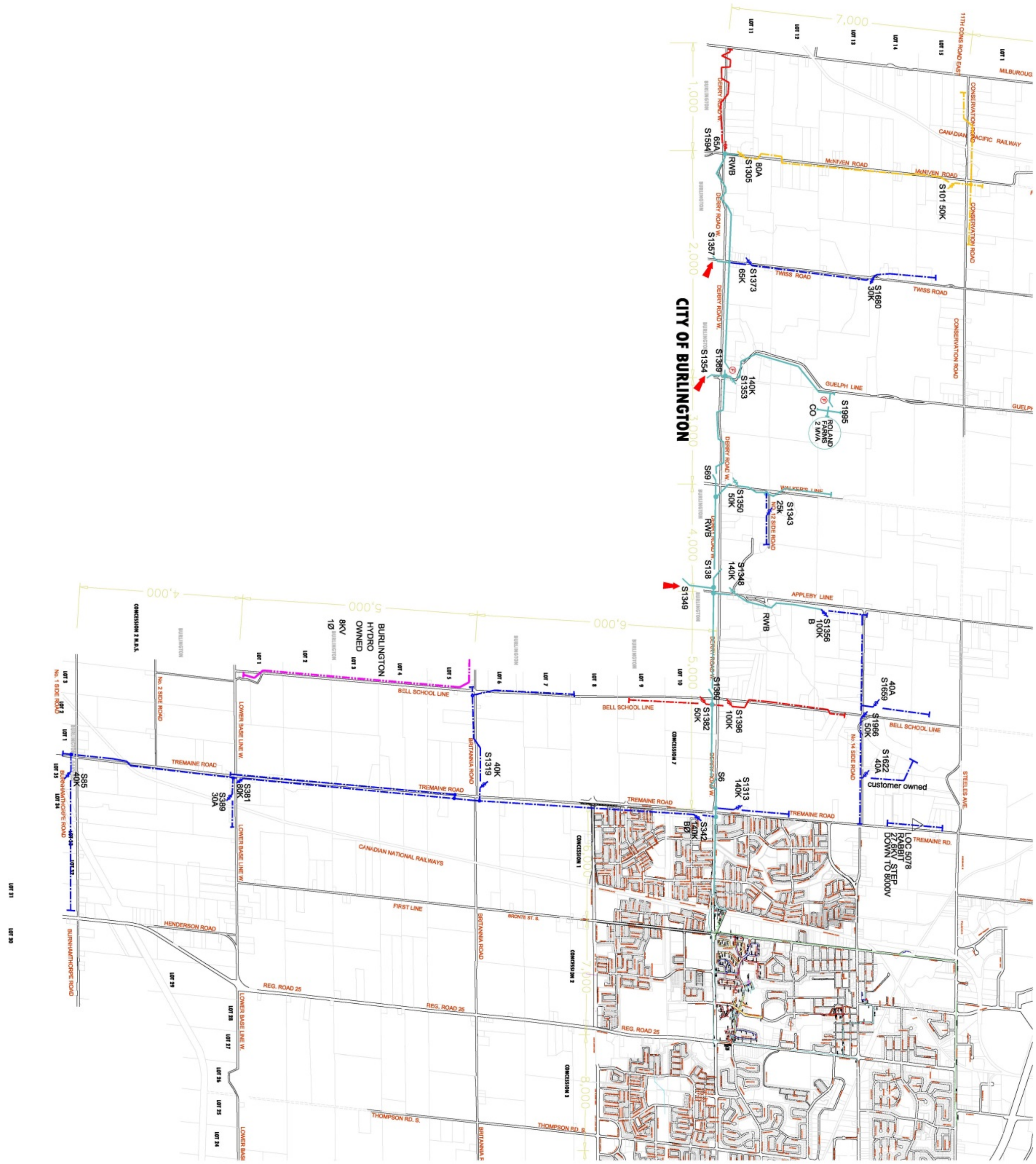


Figure 14 – 13.8kV Distribution System

Figure 15 – 8.32kV Distribution System

c. Information by asset type (5.3.2 c)

information (in tables and/or figures) by asset type (where available) on the quantity/years in service profile and condition of the distributor's system assets, including the date(s) the data was compiled;

Information regarding MHDI's 10 key assets by asset type, quantity/years in service and condition, based on expected remaining life, is shown in **Table 24**.

Table 24 – MHDI Asset summary

Asset	Sub-Category	Quantity	TUL[1] (years)	Asset Life Remaining (TUL base)					Average Age
				<10%	11% - 35%	36% - 65%	66% - 89%	>90%	
Substation Transformers		5	40	2	3				37 years
Regulators		5	40		5				31 years
Circuit Breakers		4	40	2	2				36 years
Pole Mounted Transformers		2,628	40	474	493	929	508	224	22 years
Pad Mounted Transformers		2,555	40	17	125	459	1,454	500	10 years
Pad Mounted Switchgear		75	30	4	5	26	30	10	11 years
Overhead Switches (Manual)		299	45	52	56	54	83	54	21 years
Overhead Switches (Automated)		60	30	0	1	2	16	41	4 years
Vault Transformers		107	40	10	46	38	4	9	25 years
Submersible Transformers		470	40	2	0	113	309	46	11 years
Underground Cable (metres)		579,209	40	9,318	29,914	102,250	381,138	68,558	11 years
Poles - Wood		8,745	45	2,364	1,002	2,177	2,336	866	27 years
Poles - Concrete		710	45	39	10	11	506	144	11 years

The data is as of December 2014.

Non-key distribution assets (low unit cost – run to failure) or those that require no maintenance in themselves (e.g. overhead wire) are not specifically tracked for condition assessment.

Proactive replacement strategies have been adopted for poles, pole lines, underground primary cable, and areas serviced by underground primary supplies. Reactive replacement strategies have been adopted for the remainder.

d. Assessment of existing system capacity (5.3.2 d)

an assessment of the degree to which the capacity of existing system assets is utilized relative to planning criteria, referencing the distributor's asset related objectives and targets
• where cited as a 'driver' of a material investment(s) included in the capital expenditure plan, provide a level of detail sufficient to understand the influence of this factor on the scope and value of the investment.

MS Station Capacity

MS station capacity, for planning purposes, is based on the sum of the normal rating of the station transformers. In the MHDI service area, MS are able to back each other up as shown in **Table 25** below:

Table 25 – MS backup contingency

MS	Backup
MS4	MS4
MS6	MS9
MS7	MS9
MS9	MS6, MS7(1 feeder)

Backup capability allows for short term contingency loading above transformer nameplate, to handle short term system disturbances and maintenance needs. **Table 26** below lists MS capacities and typical MS loads.

Table 26 – MS Loading

MS Name	Capacity (MVA)	2014 Peak Load (MVA)
MS4	20	4.0
MS6	5	1.6
MS7	6	0.9
MS9	6	1.4
Total	37	7.9

MHDI's long term plan is to convert the 13.8kV area to 27.6kV supply. Load growth in MS supplied areas will be accommodated through existing MS capacity or through planned MS area conversion to 27.6kV supply.

44kV feeder capacity

MHDI is distribution connected via one (1) 44kV feeder from Fergus transformer station. The 44kV feeder loading for September 5, 2014 (coincident peak loading day) is shown in **Table 27** below:

Table 27 – 44kv Feeder Loading

Feeder	Planning Capacity (Amps)	2014 Peak Load (Amps)
Fergus TS		
M4	26	23

The 44kV feeder loading remains within HONI's normal planning 44kV loading limit.

27.6kV feeder capacity

MHDI is transmission connected via eleven (11) 27.6kV feeders from Halton and Tremaine transformer stations and distribution connected via four (4) feeders from Palermo and Glenorchy transformer stations. MHDI has been allocated a combined 236.2MVA of capacity by Hydro One and Oakville Hydro. The 27.6kV feeder utilization statistics for September 5, 2014 (coincident peak loading day) are shown in **Table 28** below:

Table 28 – 27.6kv feeder utilization

Feeder	Planning Capacity (Amps)	2014 Peak Load (Amps)	% Utilization
Halton TS			
M22	300	170	57
M23	300	324	108
M24	300	100	33
M25	300	283	94
M26	300	325	108
M27	300	220	73
M28	300	325	108
M31	300	195	65
M32	300	309	103
Palermo TS			
M1	300	183	61
M3	300	0	0
Tremaine TS			
M11	300	195	65
M12	300	422	141
Glenorchy MTS			
M20	300	48	16
M21	300	129	43

The Palermo M3 feeder was temporarily out of service on the peak coincident loading day.

Feeder loading is generally within planning guidelines, with a few exceptions related to peak day operational configuration, and as such is not a key driver of material investments according to System Service needs.

The 2014 peak load was 156MVA, down 18MVA as compared to the 174MVA peak in 2013. This drop is primarily weather related and similar 10% - 15% drops in summer peaks experienced by other nearby utilities.

13.8kV and 8.32kV feeder capacity

The 13.8kV and 8.32kV feeders emanate from MHDI distribution stations. The feeder loading statistics for September 5, 2014 (coincident peak loading day) are shown below:

Table 29 – 13.8kv and 8.32kV feeder utilization

Feeder	Capacity (Amps)	2014 Peak Load (Amps)	% Utilization
MS#4			
F1	300	102	34
F2	300	391	130
F4	300	8	3
MS#6			
F1	300	43	14
F2	300	18	6
F3	300	49	16
MS#7			
F1	300	60	20
MS#9			
F1	300	29	10
F2	300	16	5
F3	300	50	17

Feeder loading is generally within planning guidelines and as such is not a key driver of material investments according to System Service needs.

Asset Lifecycle Optimization Policies and Practices (5.3.3)

An understanding of a distributor's asset lifecycle optimization policies and practices will support the regulatory assessment of system renewal investments and decisions to refurbish rather than replace system assets. Information provided should be sufficient to show the trade-off between spending on new capital (i.e. replacement) and life-extending refurbishment, and should include but need not be limited to:

a. Lifecycle policies and practices (5.3.3 a)

A description of asset lifecycle optimization policies and practices, including but not necessarily limited to:

• a description of asset replacement and refurbishment policies, including an explanation of how (e.g. processes; tools) system renewal program spending is optimized, prioritized and scheduled to align with budget envelopes; and how the impact of system renewal investments on routine system O&M is assessed;

• a description of maintenance planning criteria and assumptions; and

• a description of routine and preventative inspection and maintenance policies, practices and programmes (can include references to the DSC).

In managing its distribution system assets, Milton Hydro's main objective is to optimize performance of the assets at a reasonable cost with due regard for system reliability, safety, and customer service expectations. Milton Hydro is committed to providing its customers with an economical, safe, reliable supply of electricity and helping the Town of Milton become a leading energy efficient community in Ontario.

MHDI's practices towards asset lifecycle optimization are derived from MHDI's Asset Management Plan, Strategy and Objectives. Key asset lifecycle practices are:

<u>Asset Register development</u> - MHDI's ESRI GIS is used to display geospatially the asset information captured in asset registers. The asset register is intended to hold asset attribute information as well as historical financial and non-financial information over each asset's lifecycle. At the current time the GIS holds asset locational data and primary circuit information (e.g. nomenclature). It is the intent of MHDI to over time, populate asset register(s) with additional attribute data and historical non-financial information (i.e. inspection history, tests, etc.) which will be accessible through MHDI's ESRI GIS. Linkages to MHDI's enterprise systems will provide financial asset information.

General plant assets information resides with the respective owners of the asset (e.g. fleet assets reside with the Director Operations). The asset register will provide the relevant information for ongoing development and optimization of assets inspection, maintenance, refurbishment and replacement programs, assist with asset planning, assist in meeting regulatory/legislative compliance and IFRS accounting standards. The asset register will aid in cost control through optimization of the asset's lifecycle.

For example, subdivision cable is generally installed from a common lot of cable and if cable tests and reliability performance indicate end of life for particular cable sections, it is likely that the other cable sections may be in similar conditions thereby warranting a full subdivision cable replacement program versus the "whack-a-mole" approach repairing fault after fault after fault. The asset register can identify common asset attributes and historical performance to develop an appropriate scope for the cable replacement program.

Maintenance Planning – MHDI maintains the efficiency and reliability of its distribution system through an active inspection, maintenance and asset management program that focuses on customer service, employee safety and cost-effective maintenance and replacement of assets that can no longer meet acceptable utility standards. MHDI's inspection process enables the identification and documentation of condition-related deficiencies, which, taken together with the subsequent analysis process, results in a framework that supports maintenance and capital expenditures for the various distribution assets.

Table 30 – Inspection and Maintenance Program

Program	Field Asset	Practice	Schedule
Overhead			
	Overhead plant (poles, conductors, etc.)	Inspection	3 year cycle
	Overhead Insulators	Washing	Subject to contamination levels
	Overhead Plant (conductors, transformers, switches, etc.)	Infrared inspection	Annually
	Poles	straightening and guying	As identified through routine work
	Overhead lines	Tree trimming	3 year cycle
	Overhead switches	Maintain and adjust	5 year cycle
Underground			
	Vaults	Clean and wash	5 year cycle
	Switchgear	Inspection & Maintenance	3 year cycle
	Transformer rooms	Inspection & Maintenance	3 year cycle
	Padmount transformers	Inspection & Maintenance	3 year cycle
	Submersible transformers	Inspection	3 year cycle
	Vaults and structures	Inspection	Annually
Stations			
	MS stations	Full visual inspection	Monthly
	Station transformers	Oil tests and dissolved gas analysis	Annually
	Station equipment(breakers, relays, transformers, etc.)	Maintenance	Every 3 years
	Regulators	Oil and tap changer tests	Every 3 years
	Station batteries	Inspection & Maintenance	Annually
General Plant			
	Fleet vehicles(large)	Hydraulic Inspection	Every 3 – 6 months
	Fleet vehicles	Engine fluids and lubrication	Every 2 – 3 months
	Fleet vehicles	Rustproofing	Annual after year 3
	Facilities (HVAC, Fire sprinkler)	Inspection	Quarterly
	Facilities (Emergency Generator?)	Inspection and testing	Monthly
	IT (Hardware, software)	Updates, settings, configuration	As required minimum annually

Maintenance Planning criteria are developed in consideration of the Asset Management Objectives. Maintenance planning issues are identified through various methods and sources, primarily through feedback from distribution system operations, inspections, manufacturer's maintenance recommendations. Maintenance is performed to ensure equipment continues to provide its essential functionality in a safe manner over its lifecycle. Some assets require very frequent maintenance efforts (e.g. fleet vehicles), others assets require infrequent maintenance efforts (e.g. pole structures) and some are essentially maintenance free (e.g. conductor). For most assets uniform maintenance programs have been set up for the whole class. For very large and critical assets (e.g. station transformers) maintenance programs can be unit specific depending on the nature of asset issues discovered.

MHDI has a combined inspection and maintenance practice for field assets. General patrol requirements, as outlined in the Distribution System Code, are adhered to. Asset inspection and maintenance is designed to optimize the asset lifecycle until such time that the asset has reached a condition requiring replacement. Inspection and maintenance program details are provided in **Table 30** above.

Routine Inspection and Maintenance – As discussed in **Asset Management process components (5.3.1 b)** Milton Hydro has implemented detailed inspection and maintenance programs. These programs deliver current asset information which supplements the historical data from previous inspection cycles.

Asset Assessment/Replacement - MHDI considers a wide range of factors when deciding whether to replace a distribution asset, including public and employee safety, service quality, rate impacts, maintenance costs, fault frequency, asset condition, and life expectancy so that investment in replacement plant is a prudent one. If the malfunction of these identified assets would create a significant safety, reliability or service impact, the assets are replaced within the current year's budget. Assets that have not reached their end of life are left in service and assessed as required based on service reliability, condition assessment and regular inspections as required under the Distribution System Code.

In order to optimize equipment value and minimize replacement costs, MHDI has developed a procedure for re-use of equipment returned from the field. The procedure is in compliance with O. Reg. 22/04, section 6(1)(b) – Approval of Electrical Equipment and ensures that used equipment meets current standards and pose no undue hazard for re-use in new construction. Examples of equipment subject to potential reuse are distribution transformers, overhead secondary conductor, loadbreak switches, insulators, line hardware, wood poles, and padmount switchgear. All equipment subject to reuse has to meet certain minimum condition criteria and have to be deemed safe to use by a competent person.

Asset investment determination - Asset replacement is considered annually as part of MHDI's investment planning process along with the other capital projects scheduled for completion in the upcoming year. Non-discretionary asset replacements, due to near term significant safety or reliability issues are automatically included in the budget spend envelope. Discretionary asset replacements are prioritized and scheduled as described in section 5.3.1. Discretionary replacements provide a degree of planning flexibility to help keep annual capital expenditures stable. The outcomes of the investment planning process will align with the proposed budget envelope or may indicate that the budget envelope needs revision to adequately address underinvestment risks. To address large amounts of specific class assets (e.g. poles) at end of life, multi-year asset replacement programs, if required, have been structured to smooth out budget and resource impacts.

When assets are replaced as a result of system renewal investments, the new assets are incorporated into the inspection and maintenance programs. As the average condition and expected life of the group (e.g. poles) improves through system renewal investments, it should have a beneficial impact on how much effort is spent on reactive emergency maintenance.

Impact of System Renewal on O&M – Milton Hydro does not have a measure that captures the relationship between O&M and System Renewal investments. However Milton Hydro does believe that planned maintenance and capital replacement (System Renewal) is more economical than reactive responses to equipment failures - and less disruptive to customers. Additionally since Milton Hydro is a distribution only LDC the majority of its distribution assets are not manufactured to be refurbished as a means of extending their functional life. Assets such as pole, wire and hardware are replaced once they reach their end of life. Milton Hydro believes that in these instances potential savings are realized by mitigating asset failures and the costs associated with reactive responses. The inspection portion of O&M is not impacted by System Renewal investments.

b. Lifecycle risk management (5.3.3 b)

A description of asset life cycle risk management policies and practices, assessment methods and approaches to mitigation, including but not necessarily limited to the methods used; types of information inputs and outputs; and how conclusions of risk analyses are used to select and prioritize capital expenditures.

MHDI has initiated data collection through inspection and maintenance to provide a better understanding of each asset's stage in their lifecycle which will lead to more cost effective decisions with respect to risk management decisions.

Information is obtained through established inspection programs as discussed in **Asset Management process components (5.3.1 b**) and **Appendix J - 2016 – 2020 Asset Management Plan** (see section **4 - Condition Assessments** within the Asset Management Plan). Regular, cyclical inspection programs add to the available historical data to provide an overview of asset conditions. Inspection data, performance history, equipment vintage and life expectancies are all inputs that deliver both asset specific and population based information.

Asset performance during an investment cycle is collected and utilized in the next investment planning period. Non-discretionary investments are automatically included in the investment plan regardless of risk. Critical asset investments such as station transformers and 27.6kV plant will rank relatively high on value compared to distribution transformer investment due to the higher widespread impact that a failure of a critical asset has. However system impact is not the only factor considered when determining the priority of a capital investment. Projects with a potentially smaller system impact may be rated lower than projects with a minimal system impact but a significant safety concern.

As part of the prioritization process Milton Hydro considers:

1. The current state of the assets
2. Assets critical to performance
3. MHDI's desired level of service and mandated deliverables
4. MHDI's design and operating philosophies

Within this context projects are prioritized based on:

- Discretionary
- Non-Discretionary

Non-discretionary projects, typically System Access projects, are automatically included in response to third party needs.

Discretionary, System Renewal, capital projects are prioritized with consideration for:

- Safety
- Reliability
- System impact
- System Needs
- Pacing of Investments
- Customer impacts

While Safety is always a priority, the annual prioritization of projects attempts to deliver a balanced project list that balances the competing drivers such as cost and reliability.

It is evident that in discretionary asset replacement investments, there is a need to develop a long term smoothed proactive investment program for poles. The program will have to be structured to remain within OEB rate mitigation guidelines and will result in an increasing amount of risk for those poles identified as needing replacement through the pole testing program that await replacement towards the later years of the replacement program. In this sense risk is balanced against the reality of unsustainable rate increases that would be needed to eliminate all asset risk in a short period of time. Poles with the poorest noted condition are addressed first. Other poles in better condition but still showing less than 60% TUL remaining are deferred to future investment periods. Individual pole priority position in the program will be managed as more pole information is obtained through ongoing annual inspection and testing so as to optimize replacement risk decisions.

Capital Expenditure Plan (5.4)

A distributor's DS Plan details the programme of system investment decisions developed on the basis of information derived from its asset management and capital expenditure planning process. It is critical that investments, whether identified by category or by specific project, be justified in whole or in part by reference to specific aspects of that process.
As noted above, a DS Plan must include information on prospective investments over a minimum five year forecast period, beginning with the test year (or initial test year if Customer IR filing), as well as information on investments – planned and actual – over the five year period prior to the initial year of the forecast period.

MHDI's Distribution System Plan details the programme of system investment decisions developed on the basis of information derived from MHDI's asset management and capital expenditure planning process. Investments, whether identified by category or by specific project, are justified in whole or in part by reference to specific aspects of MHDI's asset management and capital expenditure planning process.

MHDI's Distribution System Plan includes information on prospective investments over a five year forecast period (2016 – 2020) as well as planned and actual information on investments over the five year period (2010 – 2015) prior to the initial year of the forecast period.

Plan Summary (5.4.1)

including, by category (see section 5.1.1), significant projects and activities to be undertaken and their respective key drivers; the relationship between investments in each category and a distributor's objectives and targets; and the primary factors affecting the timing of investment in each category (or of projects within each category, if significant).
The following information should be provided:

a. Capability to connect new load or generation customers (5.4.1 a)

information on the capability of the distributor's system to connect new load or generation customers in sufficient detail to convey the basis for the scope and quantum of investments related to this 'driver';

MHDI's distribution system is efficiently utilized. All 5 TS and 4 MS that remain in service have sufficient transformation capacity to accommodate any load or generation expected over the period of the DSP. The 27.6kV distribution feeders within MHDI territory are constructed and loaded such that they are not constrained in accepting new load or generation over the period of the DSP as noted in MHDI's most recent load forecast. Some system reconfiguration may be required to balance out feeder loading to accommodate new loads and generation. New feeder construction will be required to access new transformer station capacity that will become available in 2020.

Upstream capability (i.e. HONI TS, transmission, etc.) to accommodate new load and generation are determined through the Regional Planning process.

Currently, as determined by Hydro One there are generation connection limitations at Palermo TS, no other connection limitations exist.

The Regional Planning process has identified a requirement for a new Transformer Station to supply the Milton Hydro Service area. The reports projects a need date of 2020. Milton Hydro will be exploring possible options to satisfy this need - See **Final deliverables of the Regional Planning process (5.2.2 b)** and **Impact on DSP** within that section.

b. Total annual expenditures 2016 – 2020 (5.4.1 b)

total annual capital expenditures over the forecast period, by investment category (see section 5.4);

The following table summarizes the planned capital expenditures, by investment category, over the period of the DSP:

Table 31 – 2016 – 2020 Planned Capital Expenditures

Category	2016 ($,000)	2017 ($,000)	2018 ($,000)	2019 ($,000)	2020 ($,000)
System Access	7,906	8,092	6,212	6,411	6,878
System Renewal	1,863	1,821	1,790	1,800	1,725
System Service	1,139	1,225	1,350	1,350	1,500
General Plant	720	701	711	676	696
Total	**11,628**	**11,839**	**10,063**	**10,237**	**10,799**

c. Effect of asset management and capital investment process outputs on capital expenditures (5.4.1. c)

a brief description of how for each category of investment, the outputs of the distributor's asset management and capital expenditure planning process have affected capital expenditures in that category and the allocation of the capital budget among categories;

The capital budget is allocated among the categories according to the non-discretionary and prioritized discretionary investments in the final capital investment. The final capital investment considers the balance between achieving MHDI's asset management objectives and impact on customer rates.

<u>System Access</u> – The investments are externally driven and generally non-discretionary. Timing of investment is driven by the needs of the external parties. Large projects, such as road widening projects require large amounts of capital and other resources. This category will generally have priority in capital budget allocation.

<u>System Renewal</u> –A long term proactive investment program is required for pole assets. This need has been reflected in the increase of spending in this category over the period of the DSP. Other spending in this category will be for discrete projects and will be determined on the basis of ongoing system asset performance. Future funds ranging from $400k to $1,100k have been reserved in this category for renewal needs due to unanticipated asset failure. Category spending remains relatively stable during the forecast period and does not detract from the other investment categories.

<u>System Service</u> –A continued investment in MHDI's smart grid program is warranted. Investments will maintain steady improvement in system automation. New TS feeder investments are required in the 2017 – 2020 timeframe. Category spending remains relatively stable during the forecast period and does not detract from the other investment categories.

General Plant - General plant investment is projected to remain stable for the 2016 – 2020 period. The projected spend includes investments in rolling stock, computer hardware and software and other equipment and tools that support the effective delivery of electrical distribution services.

d. Material capital expenditure projects/activities (5.4.1 d)

a list and brief description including total capital cost (table format recommended) of material capital expenditure projects/activities, sorted by category;

Material capital expenditures in 2016 are summarized in **Table 32** below

Table 32 – Material Capital Expenditures 2016

Category	Project Name	2016 $'000
System Access	Steeles Ave – Industrial to Martin	$284
	Britannia Rd– RR25 to JSP	$1,005
	Garden Lane -400m	$133
	5th Line; LSL to Derry Road	$415
	5th Line; LSL to Britannia Road	$397
	Britannia Rd – RR25 to Tremaine	$403
	Bronte Street – LSL to Britannia	$390
	Meters	$293
	Customer Connections	$682
	Subdivision development	$3,780
	Sub Total	**$7,782**
System Renewal	Pole Replacement Program	$500
	Porcelain to Poly program	$150
	Derry Rd – Trafalgar to 8th	$155
	6th line – Nass South of 25 SR	$322
	6th Line – Nass north of 20 SR	$321
	Misc system renewal	$350
	Sub Total	**$1,798**
System Service	WiMAX – automate existing switches	$120
	WiMAX – 100 Meter points	$650
	Automated Fault Indicators – WiMAX	$175
	New Automated switches - WiMAX	$194
	Sub Total	**$1,139**
General Plant	Rolling Stock	$510
	Sub Total	**$510**
	TOTAL	**$11,229**

Steeles Ave – Industrial Dr. to Martin St.($284k) – The Region of Halton is widening Steeles Ave. from 2 lanes to 4 Lanes. Milton Hydro is required to relocate existing pole, wires, hardware, transformers and conduit to accommodate the road widening.

Britannia Rd– RR25 to James Snow Parkway (JSP) ($1,005k) - The Region of Halton is widening Britannia Rd. from 2 lanes to 4 Lanes. Milton Hydro is required to relocate existing pole, wires, hardware, transformers and conduit to accommodate the road widening which encompasses approximately 3.5 km.

Garden Lane ($133k) – The Town of Milton is reconstructing a portion of Garden Lane requiring Milton Hydro to relocate existing pole, wires, hardware and transformers.

5th Line; Louis Saint Laurent to Derry Road ($415k) - The Town of Milton is widening 5th Line from 2 lanes to 4 Lanes. Milton Hydro is required to relocate existing pole, wires, hardware, and transformers to accommodate the road widening

5th Line; Louis Saint Laurent to Britannia Rd. ($397k) - The Town of Milton is widening 5th Line from 2 lanes to 4 Lanes. Milton Hydro is required to relocate existing pole, wires, hardware, and transformers to accommodate the road widening.

Britannia Rd – RR25 to Tremaine ($403k) - The Region of Halton is widening Britannia Rd. from 2 lanes to 4 Lanes. Milton Hydro is required to relocate existing pole, wires, hardware and transformers to accommodate the road widening.

Bronte Street – Louis Saint Laurent to Britannia ($390k) - The Town of Milton is widening Bronte St. from 2 lanes to 4 Lanes. Milton Hydro is required to relocate existing pole, wires, hardware, and transformers to accommodate the road widening

Meters ($293k) – This represents the capital cost associated with meeting new metering requirements in 2016.

Subdivision Development ($3,780k) – This represents the gross cost of servicing new residential connections in 2016 – projected to be 1,500 new units.

Pole Replacement Program ($500k) – Milton Hydro proposes to replace approximately 100 poles, identified through its pole inspection program, that need to be replaced.

Porcelain to Poly program ($150k) – Milton Hydro is proposing to replace porcelain insulators and switches, at various locations, that pose a reliability and safety concern.

Derry Rd – Trafalgar to 8th Line ($155k) – Milton Hydro is proposing to rebuild a section of overhead line and close the loop between 2 existing feeds to the area.

6th line – Nass South of 25 Side Road ($322k) – Milton Hydro is proposing to rebuild this section of overhead plant which is reaching end of life. The work will involve replacing poles, wires, hardware and transformers.

6th line – Nass North of 20 Side Road ($321k) – Milton Hydro is proposing to rebuild this section of overhead plant which is reaching end of life. The work will involve replacing poles, wires, hardware and transformers.

Miscellaneous System Renewal ($350k) – This is a provision for unplanned projects which may arise during the 2016 budget year.

WiMAX – automate existing switches ($120k) – This proposed spend is to automate existing system switches by connecting them to Milton Hydro's WiMAX communications infrastructure. The proposed cost is to automate approximately 33 locations.

WiMAX – 100 Meter points ($650k) - This proposed spend is to connect our existing metering points to Milton Hydro's WiMAX communications infrastructure. This will resolve the obsolescence issue associated with Milton Hydro's existing analog cellular communications infrastructure. This proposed cost is for 100 metering points.

Automated Fault Indicators – WiMAX ($175k) – This proposed expenditure is intended to support Milton Hydro automation efforts by providing real time system information in both fault situations and during normal operations. This proposed cost is for 40 automated fault indicators connected to Milton Hydro's WiMAX communications infrastructure.

New Automated switches – WiMAX ($194k) – This proposed cost is to install 4 new automated switches connected to Milton Hydro's WiMAX communications infrastructure. This will support Milton Hydro's automation efforts by provide remote switching capabilities thereby increasing system visibility through our SCADA system and increased response time to system outages.

Rolling Stock ($510K) – In 2016 Milton Hydro proposes to invest $510,000 to acquiring a transit van, one squirt boom truck and a 46' single bucket truck. These trucks are used for the construction and maintenance of overhead/underground plant, and for the emergency restoration services.

e. Material impacts of Regional Planning Process/Infrastructure Plan (5.4.1 e)

information related to a Regional Planning Process or contained in a Regional Infrastructure Plan that had a material impact on the distributor's capital expenditure plan, with a brief explanation as to how the information is reflected in the plan;

The outcome of the Northwest GTA Sub-Region Integrated Regional Resource Plan (IRRP) is discussed in **Final deliverables of the Regional Planning process (5.2.2 b).** The link to the IRRP is available in **Appendix A – Document Links**. A copy of the Hydro One planning status letter has been included in **Appendix G – Regional Planning Status Letter**.

Material Impact on DSP

The Northwest Sub-Region IRRP findings include a need for new transformation facilities to service Milton Hydro load growth by 2020, the final year of Milton Hydro's forecast period. This will require a significant investment by Milton Hydro. Factors such as transformer station location and ownership (Milton Hydro or Hydro One), the loading schedule and transformer station design will impact the investment Milton Hydro will need to make in the transformer station. Due to the timing of the IRRP, the DSP preparation and the timing of the proposed transformer station Milton Hydro has not had an opportunity to investigate the options available for a new transformer station. As a result Milton Hydro has not yet proposed budgetary amount for the new station. Milton Hydro plans to explore the possible options available for a new transformer station and establish a preliminary budgetary target in 2016.

f. Customer engagement activities (5.4.1 f)

a brief description of customer engagement activities to obtain information on their preferences and how the results of assessing this information are reflected in the plan;

Milton Hydro provides a detailed description of it customer engagement activities in **Description of the consultations (5.2.2 a)**.

Customer engagement is considered essential to achieving MHDI's Customer Focus outcomes. MHDI uses a variety of activities to engage customers and determine their preferences for the development of MHDI's distribution system going forward.

Customer surveys provide a high level assessment of customer preferences with respect to service reliability and operational effectiveness. In 2014 MHDI engaged Utility Pulse to conduct a survey of its customers. Survey results indicate satisfaction with current service performance levels which indicates that plan efforts to maintain historical levels are reasonable thereby supporting system operational efforts and prudent smart grid development as outlined in the plan. Concern about rates supports the need to consider rate mitigation efforts while managing risk and smoothing spending over time for discretionary investments. Survey results are implicitly considered in the development of the asset management strategy, objectives and plans.

The most important service improvements, from the customer's perspective, are shown in **Table 33** below:

Table 33 – Customer service preferences (2014 Utility Pulse Survey)

One or two most important things 'your local utility' could do to improve service	
Milton Hydro	% of all suggestions
Better prices/lower rates	31%
Better on-line presence	20%
Better communications with customers	16%
Improve reliability of power	14%
Information & incentives on energy conservation	13%
Better Maintenance	11%
Increase service hours/availability of hydro representative	8%
Be more efficient	6%
Remove hidden costs on bills	5%
Improve/simplify/clarify billing	4%
Don't charge for previous debt	3%
Eliminate SMART meters	2%
Staff related concerns	2%

Public Information Centres (PIC) are used to engage customers on specific issues. . Customers have the opportunity to provide feedback on the issue and influence Milton Hydro's plans.

Going forward, MHDI plans to enhance customer awareness of plan specifics by posting a summarized and simplified version of the 5 year investment plan on the MHDI website. Any comments received will be considered in upcoming iterations of the capital investment plan.

Milton Hydro has made allowances within the DSP for all third party requirements. The proposed 2016 budget include approximately $7.8 million in System Access provisions. In response to the demand for continual efficiencies and continued system reliability performance Milton Hydro is also investing approximately $1.1 million in System Service projects intended, in part, to deliver a faster response time when system events, such as a fault, occurs.

Individual customer consultation produced a tremendous amount of discussion regarding Milton Hydro and its role within the electricity sector, however the discussions did not result in any material impact to the final DSP.

g. System forecast development 2016-2020 (5.4.1 g)

a brief description of how the distributor expects its system to develop over the next five years, including in relation to load and customer growth, smart grid development and/or the accommodation of forecasted renewable energy generation projects;

Milton Hydro discusses the Town of Milton's projected growth in **Key elements of the Distribution System Plan that affect its rates proposal (5.2.1 a**). The impact of the IRPP on the DSP is reviewed in **Final deliverables of the Regional Planning process (5.2.2 b)** and **Material impacts of Regional Planning Process/Infrastructure Plan (5.4.1 e)**.

It is expected that the operational and service requirements driving MHDI's capital expenditures will generally remain consistent through the 2016 to 2020 planning window with some exceptions for station related capacity development as noted below. MHDI expects load and customer growth in line with development plans and intensification forecasts at the municipal and regional level as noted below:

1. Ontario Places to Grow Act
2. Halton Region Official Plan (2015)
3. Milton Strategic Plan – Destiny Milton 2 (DM2) (2006)
4. Milton Master Transit Plan 2013-2017
5. Milton Intensification Study (2010)
6. Town of Milton Official Plan (OPA31) (2010)
7. Regional Municipality of Halton - Best Planning Estimates of Population, Occupied Dwelling Units and Employment, 2007-2021
8. GTA West – Northwest Sub-Region supply study

Load growth is driving the need for a new Transformer Station in the last year of the forecast period (2020). Responsibility for developing the transformation capacity is still to be determined. MHDI will be required to construct new feeder lines to access the new station capacity. This has been confirmed by the GTA West Northwest Sub-Region IRRP dated April 28, 2015. See **Appendix A – Document Links.**

System renewal investments (end of life replacement) will ensure that customer service levels with respect to reliability are maintained. Increased emphasis on inspection and condition and performance analytics will help direct preventive maintenance to specific at-risk equipment and extend the safe, reliable useful life of all equipment.

As discussed in **Key elements of the Distribution System Plan that affect its rates proposal (5.2.1 a)** Milton Hydro plans to make System Service investments to ensure the distribution system continues to meet operational objectives while addressing current and future customer and regulatory requirements. These investments help to maintain and improve reliability and safety measures associated with the distribution system and improve operational system efficiencies. Milton Hydro continues to make System Service investments that promote the growth and development of MHDI's WiMAX based Smart Grid. In 2016 Milton Hydro is proposing to invest approximately $1.14 million in System Service projects. This proposed investment may be categorized into 2 primary project types WiMAX Communication Investments and Automated Equipment Investments. The investment in the WiMAX infrastructure will support future automation/smart grid needs.

The accommodation of renewable energy generation projects is not expected to drive any significant system developments over the next five years.

h. Capital Investments Customer Preferences/Technology/Innovation (5.4.1 h)

a list and brief description including where applicable total capital cost (table format recommended) of projects/activities planned:
• in response to customer preferences (e.g., data access and visibility; participation in distributed generation; load management);
• to take advantage of technology-based opportunities to improve operational efficiency, asset management and the integration of distributed generation and complex loads; and
• to study or demonstrate innovative processes, services, business models, or technologies.

Table 34 – Capital Investment Specific Customer Preferences

Category	Project Name	2016 Budget	Driver
System Access	Steeles Ave – Industrial to Martin	**$284,000**	Road Project
	Britannia Rd– RR25 to JSP	**$1,005,000**	Road Project
	Garden Lane -400m	**$133,000**	Road Project
	5th Line; LSL to Derry Road	**$415,000**	Road Project
	5th Line; LSL to Britannia Road	**$397,000**	Road Project
	Britannia Rd – RR25 to Tremaine	**$403,000**	Road Project
	Bronte Street – LSL to Britannia	**$390,000**	Road Project
	Meters	**$293,000**	Customer Connections
	Customer Connections	**$682,000**	Individual Customer Connections
	Subdivision development	**$3,780,000**	Subdivision Connections

Table 34 lists material project which are specific responses to customer needs and preferences. Greater project detail is provided in **Material Investments (5.4.5.2)** in the **2016 Material Projects** section.

Below **Table 35** lists System Service projects intended to meet reliability and efficiency expectations. The projects listed support Milton Hydro's automation/smart grid efforts.

Table 35 - Capital Investment Customer Preferences

Category	Project Name	2016 Budget	Driver
System Service	WiMAX – automate existing switches	$120,000	Reliability Efficiency
	WiMAX – 100 Meter points	$650,000	Efficiency Security
	Automated Fault Indicators – WiMAX	$175,000	Reliability Efficiency
	New Automated switches - WiMAX	$194,000	Reliability Efficiency

MHDI believes that it has incorporated customer preferences through the feedback it has received from the communication channels that it maintains as described in **Customer engagement activities (5.4.1 f)**. MHDI has successfully engaged customers and promoted their participation in CDM and DG programs. The CDM 2013 Annual Report submitted to the OEB demonstrated MHDI's efforts in delivering the IESO/OPA-Contracted Province-Wide CDM Programs to the residential and commercial customer sectors.

There are no planned significant capital related studies or demonstrations related to innovative processes, services, business models or technologies during the period of this DSP

Capital Expenditure Planning Process Overview (5.4.2)

This section of the Distribution System Plan (DSP) provides a high level overview of MHDI's capital investment planning process. Capital investments are determined through the Capital Budget process. The capital investment planning process is embedded within MHDI's Asset Management process.

Capital Budget Process

The Capital Budget process at Milton Hydro is an integral planning tool and ensures that appropriate resources are available to maintain and grow its capital infrastructure. It is the responsibility of each department to contribute in the preparation of the Capital and Operating budget, with the assistance of the Finance department. The responsibility of the Finance department is to coordinate the capital budget and forecast process and present a preliminary Capital budget to the President & CEO for approval. Once the preliminary Capital budget and long range forecast has been approved by the President & CEO, it is presented to the Board of Directors as follows:

1. The President/CEO and the VP, Finance present a preliminary Capital budget and long range forecast at a special meeting of the Board.
2. Subsequent to the special meeting, the Finance department makes any refinements to the Capital budget and long range forecast, as necessary.
3. The President/CEO, with the assistance of the VP, Finance present and recommend the updated Capital budget to Milton Hydro Distribution's Board of Directors for approval.
4. It is then the responsibility of the Board of Directors, on behalf of the stakeholders, to approve the budget
5. Once approved the complete finance package is presented to the shareholder, the Town of Milton via the CAO and Treasurer.

Once the Board of Directors approve the annual budget the budget amounts do not change but rather provide a plan against which actual results may be evaluated. In addition to the capital needs of the distribution system, Milton Hydro plans for the required maintenance of its assets considering both performance and safety.

Budget Directives

Milton Hydro compiles budget information for the three major components of the budgeting process:

1. revenue forecasts,
2. operating and maintenance expense forecast and
3. capital budget forecast.

1. Revenue Forecast

Milton Hydro's revenue forecast is based on the forecasted kWh, kW and customer counts for the 2016 Test Year. Milton Hydro prepared its weather normalized load forecast by customer class and monthly customer class data for the weather sensitive customer classes using the regression analysis and by average usage and forecasted customer growth for the non-weather sensitive customer classes. The forecast results are then used to calculate the 2016 Test Year revenue requirement at existing rates and proposed rates. A detailed explanation of the forecast methodology and distribution revenue is provided in EXHIBIT 3 of the Application.

2. Operating Maintenance and Administration ("OM&A") Expense Forecast

Milton Hydro allocates available person hours to the capital work that will be done in-house with the remaining hours allocated to identified O&M projects. Contract work is determined based on the level of expertise required and staffing availability. Milton Hydro reviews and establishes the budget based on historical trends and known factors as opposed to simply applying an arbitrary inflation factor. Labour costs are in accordance with the Collective Agreement. Details are provided in EXHIBIT 4 of the Application.

3. Capital Budget

Milton Hydro's Asset Management Plan identifies the capital projects required and projected to be required over a 5 year period based on the best available information for each year. The capital budget forecast is influenced significantly by growth and the conversion of aging infrastructure. All proposed capital projects for the Bridge Year and Test Year will be completed and in service in their respective year. Details of Milton Hydro's capital budget are provided in EXHIBIT 2 of the Application. Milton Hydro acknowledges that, where the priority of projects changes, Milton Hydro may be required to re-evaluate the future year's capital project forecast.

The Asset Management capital planning investment cycle consists of the following steps:

1. Review of System Performance
2. Determination of Asset Inventory condition and needs
3. Set preliminary budget envelope
4. Establish Investment requirements
5. Investment plans and budget approval
6. Investment Plan Implementation

The capital planning investment process is linked to MHDI's Asset Management objectives which guide the capital investment decision making.

a. Capital expenditure planning objectives, and criteria (5.4.2 a)

a) a description of the distributor's capital expenditure planning objectives, planning criteria and assumptions used, explaining relationships with asset management objectives, and including where applicable its outlook and objectives for accommodating the connection of renewable generation facilities;

Planning Objective

MHDI's planning objective can be summarized as determining the optimum level of investment in and configuration of distribution capacity while having due regard to:

- corporate objectives;
- stakeholder interests;
- relative costs and benefits associated with distribution development strategies;
- acceptable levels of risk;
- environmental factors that directly or indirectly impact on the efficient and reliable operation of the distribution network.

Planning Criteria

In terms of the overall planning criteria, MHDI, like most Ontario utilities, has adopted a deterministic or redundancy standard for distribution system planning. The redundancy standard will trigger an investment when the capability of an asset, such as a substation transformer, is exceeded under normal or contingency operating standards depending on the type of asset. Redundancy, in terms of capacity, is built into the distribution system to deal with certain contingency situations however customers will experience an interruption, upon loss of a distribution system element, while backup capacity is engaged or an asset is replaced. Outage time is also impacted by the level of distribution automation present in the system.

MHDI, like other distribution utilities strives to ensure its distribution system provides a reliable level of service to existing customers and connection capacity for forecasted demand growth and as such must be able to handle customer supply needs during normal and certain contingency situations. Overloading of distribution equipment, as a result of inadequate investment, is avoided as much as possible.

Supporting this effort is Milton Hydro's asset management efforts as detailed in **Appendix J – 2016 – 2020 Asset Management Plan** including ongoing Inspections and condition assessments (see section **4 – Inspections and Condition Assessments** within **Appendix J**) and an investment plan summarized in **Capital Expenditure Summary (5.4.4)**.

HONI and Oakville MTS DESN stations

MHDI receives power from 4 HONI and 1 Oakville Hydro owned stations. The stations are standard Dual-Element Spot Network (DESN) configurations and as such offer N-1 contingency at the transmission line and station transformer level subject to the specific operating practices of HONI and Oakville Hydro. Loss of a transmission line or power transformer at a station will not normally result in an interruption to MHDI customers as a result of the DESN arrangement.

Municipal Station Transformers

MHDI owned Municipal Stations supply a small amount of overall MHDI load and customers but still are essential components of the distribution system whose service disruption results in a number of customers being out of supply. To this end municipal stations are planned, configured and loaded so as to provide some measure of reserve capacity for contingency situations. A municipal station transformer should not be loaded above its Normal rating during non-contingency situations. Operating above Normal rating will result in a shortening of the transformer service life. Under contingency situations, the transformer can be operated at its emergency rating for a short period and load is to be transferred to other municipal stations, without exceeding the LTR rating of the municipal station transformers or circuits receiving the load, as soon as possible. MHDI's plan is to convert the 13.8kV municipal station load to the 27.6kV feeder system and eliminate the 13.8kV municipal station.

27.6kV feeders

The distribution feeders from each HONI/Oakville Hydro transformer station are in a "grid" configuration. Multiple 27.6kV feeders traverse the distribution area with multiple interconnections between the feeders at various points. This includes feeders from different transformer stations. 27.6kV feeders are critical components of the distribution system. Service disruption results in a large number of customers being out of supply. To this end 27.6kV feeders are planned, configured and loaded so as to provide some measure of reserve capacity for contingency situations. In order to facilitate this restoration capability, normal feeder loading is planned to be a maximum of 50% of circuit rating under normal operation. Circuit rating is determined by the load carrying capacity of the feeder conductor and switches and well as the available capacity from and equipment ratings of the source HONI and Oakville Hydro transformer stations. Under contingency situations, all interrupted load should be restored within a short time period. Switches are installed on circuits to isolate faulted conductors and to permit the circuits to be subdivided if required. Normally open ties are provided between adjacent circuits to permit transfer of load during contingencies.

13.8kv and 8.32kV feeders

The distribution feeders from each municipal substation are in a "grid" configuration. Multiple feeders traverse the MS distribution area with multiple interconnections between the feeders at various points. This includes feeders from different MS. 13.8kV and 8.32kV feeders supply a small amount of overall MHDI load and customers but still are essential components of the distribution system. Service disruption results in a large number of customers being out of supply. To this end 13.8kv and 8.32kV feeders are planned, configured and loaded so as to provide some measure of reserve capacity for contingency situations.

Other distribution assets service a much smaller number of customers and may not have as high a disruptive impact when unavailable.

Renewable Generation

It is MHDI's assessment that the distribution system has sufficient capacity to accommodate foreseeable renewable generation connections within the period covered by the Distribution System Plan. MHDI's planning objective with respect to renewable generation is to continue to facilitate the connection of renewable generation in a timely manner consistent with the provisions of the Distribution System Code. Based on its assessment, Milton Hydro does not require any provision within the DSP to accommodate Renewable Generation.

Reliability

The distribution system will achieve certain levels of reliability performance depending on the planning criteria in place and asset lifecycle support programs. For MHDI, the planning criterion ensures that the following annual reliability service level objectives are achieved:

Table 36 – Reliability performance objectives

Service function	Objective
System Outage Duration	SAIDI within range of past 5 year performance
System Outage Frequency	SAIFI within range of past 5 year performance
Emergency response	60 minutes maximum 80% of the time

The 2010 OEB sponsored Pollara survey solicited the opinions of consumers from across the province regarding electricity outages and other reliability related issues. The survey indicated that the majority of consumers are generally satisfied with current levels of system reliability and do not favour increasing their rates in order to fund improvements in system reliability. MHDI believes that maintaining reliability performance within range of the past 5 year performance is appropriate as it is well below MHDI's peer group (GTA Towns) average for SAIFI (1.32) and SAIDI (1.27) as identified in the PEG Service Reliability Standards in Ontario: Analysis of Options report dated September 2013. In this sense MHDI is seeking to balance reliability with customer cost.

The planning criteria assume:

- that equipment maintenance, and replacement programs are in place to ensure that the capacity and capability of the distribution system is maintained at reasonable level of risk of disruption due to lifecycle related equipment failure;
- that incidences of extreme weather will continue to be manageable under existing standards of design and construction.

The following is a summary of MHDI's key planning criteria:

Planning Criteria

Table 37 – Planning Criteria

Criteria	Planning guideline
General	In planning the system, "good utility practice" shall be followed.
System Voltages	The primary supply voltage shall be 27.6kV. 13.8kV and 8.32kV service voltages shall be maintained in legacy MS supplied areas.
Municipal Stations	Municipal Stations are supplied from 27.6kV or 44kV primary feeders.
	MS Transformers maximum allowable loading, under normal conditions shall be their ONAN ratings. Under contingency conditions, the 13.8kV MS transformers can be loaded to ONAF ratings for short time periods only as this will result in loss of transformer life. The MS distribution system shall be constructed and configured to allow for MS transformers to be backed up by one or more neighbouring MS stations in the event of a station contingency situation.
Feeders	All 27.6kV feeders shall be designed for full backup capability over peak loading conditions through the switching of load to an adjacent feeder or multiple adjacent feeders. In order to facilitate this restoration capability, normal feeder loading will be planned to a maximum of 50% of circuit rating under normal operation. Overhead circuit rating is primarily a thermal rating determination such that the conductor does

	not sustain significant loss of strength due to annealing over its useful life. Underground circuit ratings are based on applicable cable ampacity ratings based on the type of cable and conditions of installation, to optimize cable loss of life over its lifecycle.
	Overhead 27.6kV feeders shall be 556 MCM Al. on poles with armless construction. Overhead laterals of more than 200A that could be tied to another feeder or feeder lateral will also have 556 MCM Al. conductors
	Underground 27.6kV feeders in subdivisions shall be 1/0 TRXLPE Al cables Maximum cable loading shall be 200A
	Current imbalance is defined as the maximum phase current deviation from the average phase current, as a percentage of the average phase current. Feeders with a phase current deviation in excess of 20% from average will be considered for rebalancing. New single phase load additions should be connected to the phase with the least connected KVA, if it is available, to maintain a balanced circuit.
	Under normal and contingency situations, circuit voltage drop shall be managed such that customer service voltages shall comply with the standards of the Canadian Standards Association, CSA Standard CAN3-C235-83.
	Losses on three phase feeders should be kept to a minimum through the use of appropriately sized conductor, optimal feeder loading and phase balancing.
Planning Horizon	The planning horizon shall be 5 years to align with the Distribution System Plan requirements. Regional planning exercises may identify planning needs in excess of the DSP 5 year planning horizon
Distribution Automation	Distribution automation through remote switching is to be provided in accordance with the capital investment prioritization process. Distribution automation ensures that load lost during single contingencies can be restored in a minimum amount of time
Protection Philosophy	MHDI 27.6kV is primarily an overhead distribution system. Feeder protection shall incorporate appropriate autoreclose settings to mitigate the impact of transient faults. In certain circumstances the autoreclose setting will be disabled where all faults on the circuit are expected to be permanent in nature. Trip saving protection will be enabled to allow fuses and reclosers to isolate faults where they provide the first line of protection
Distribution Transformers	Distribution transformers are installed in residential and commercial & industrial locations using approved technical standards and industry accepted practices.
Fleet and tools	Replacement of fleet vehicles and tools shall be scheduled and prioritized to ensure the reliable and timely execution of maintenance and capital expenditure programs. MTO guidelines for fleet vehicle replacement shall be used as a standard
Equipment Asset Management	Equipment shall be procured, installed, maintained and disposed of through MHDI's Asset Management process
Undergrounding	Undergrounding of existing MHDI overhead assets shall be considered where there are external cost recovery mechanisms, outside the electricity rate setting process.

Distribution System Contingencies

Contingency Plans are required to deal with any asset related event that affects the proper functioning of the distribution system. Contingency planning deals with potential high impact low probability (HILP) events that can have major repercussions on the distribution system and MHDI customers. This will mostly apply to critical assets such as multiple circuit 27.6kV feeders. All other events, that are generally regular occurrences, low impact, low scope and have established processes to deal with them, are not detailed here. The HILP events considered here are shown in the **Table 38** below:

Table 38 – Contingency events and plans

Asset Class	Contingency Event	Contingency Plan
MS Power Transformers/reclosers	Transformer/recloser failure requiring off-site servicing	1. Permanent load transfer to adjacent MS (8.32kV) 2. Existing transformer/recloser circuit at station (13.8kV)
25MVA Regulators	Regulator failure	1. Spares – Critical parts list 2. Contact plan for manufacturer repair support 3. Feeder emergency loading capability 4. Ties to alternate supplies
27.6kV Feeder cables	Failure of one or more underground cables	1. Spare cable reel 2. Ties to alternate supplies
MS RTU	Failure of RTU leading to loss of station control	1. Standby staff to man station 2. Contact plan for manufacturer repair support
Station Protective Devices	Device failure leading to full/partial loss of station	1. Spare – Critical Parts list 2. Ties to alternate DS supplies
Poles/conductors	Loss of high number of pole structures through high impact event (severe weather, etc.)	1. Stock poles/conductors 2. Supplier stock 3. Neighbouring LDC stock

In all cases if available contingency measures prove insufficient, load shedding may be required to ensure equipment is not loaded beyond approved tolerances.

Distribution Planning is part of the Asset Management process and is a year round activity. Issues of growth and reliability are evaluated on an ongoing basis to determine optimal solutions that feed into the investment process. Computer modelling tools, such as CYME, are used in conjunction with GIS information to evaluate distribution system configuration performance with respect to the planning criteria. Solutions incorporate a balance of corporate and stakeholder interests.

MHDI recognizes that the customer value of reliability also needs to be a factor in investment planning and timing.

b. MHDI policy and procedure on incorporating non-distribution system alternatives (5.4.2 b)

if not otherwise specified in (a), the distributor's policy on and procedure whereby non-distribution system alternatives to relieving system capacity or operational constraints are considered, including the role of Regional Planning Processes in identifying and assessing alternatives;

MHDI does not have any specific policy or procedure related to utilizing non-distribution system alternatives for system capacity or operational constraint relief. MHDI's activities in this area are delivered through the MHDI 2015-2020 CDM programs in accordance with the CDM requirement included in MHDI's licence as issued by the OEB. MHDI's total 2015 – 2020 CDM target is 45.36 GWh as determined by the IESO/OPA.

MHDI's 2015-2020 CDM programs are consistent with OEB policy and the OEB's 2015 CDM Guidelines of putting conservation first into distribution planning. MHDI's CDM programs are designed to reduce electricity consumption and draw from the grid upstream of the customer. MHDI's CDM program consists of IESO funded programs and MHDI specific programs that are to be funded solely through distribution rates.

Proposed distribution rate funded programs may consist of:

1. CDM programs that target peak demand (kW) reductions to address a local constraint of MHDI's distribution system.
2. Demand response programs whose primary purpose is peak demand reduction in order to defer capital investment for specific MHDI distribution infrastructure.
3. Programs to improve the efficiency of the distribution system and reduce distribution losses. (i.e. re-conductor to larger size, voltage conversion, etc.)
4. Energy storage programs whose primary purpose is to defer specific capital spending for the MHDI distribution system.

MHDI actively participates in the Regional Planning process to identify any system capacity or operational constraint relief that can be achieved through cooperative planning and program execution with regional distributors and transmitters. MHDI's detailed CDM programs actively encourages customers to conserve energy through a variety of means providing an implicit area wide capacity and operational relief effort.

The impact of renewable generation and CDM programs is factored into the load forecast process for determining capacity growth/decline impacts.

The amount of proposed renewable energy generation and CDM program impact, during the period of the Distribution System Plan does not offer any significant capacity or operational constraint relief to MHDI's distribution system.

c. Processes, tools and methods used to identify, select, prioritize and pace projects in each investment category (5.4.2 c)

a description of the process(es), tools and methods (including where relevant linkages to the distributor's asset management process) used to identify, select, prioritise and pace the execution of projects in each investment category (e.g. analysis of impact of planned capital expenditures on customer bills);

Project Identification

The projects that MHDI selects for its capital budget are the ones that are required to ensure the safety, efficiency, and reliability of its distribution system to allow MHDI to carry out its obligation to distribute electricity within its service area as defined by the Distribution System Code.

System Access projects such as development and municipal plant pole relocation projects are identified throughout the year by external proponents. Most of these projects are non-discretionary in nature and are budgeted and scheduled to meet the timing needs of the external proponents.

System renewal projects are discretionary in nature. The project needs for a particular period are supported by a combination of asset inspection, individual asset performance, and asset condition assessments.

System Service projects are discretionary in nature and ensure that any forecasted load changes that constrain the ability of the system to provide consistent service delivery are dealt with in a timely manner.

General plant projects, such as fleet vehicle acquisition or replacement, software/hardware, etc., are discretionary in nature and are identified internally by specific departments (engineering, finance, operations, administration, etc.) and supported through specific business cases for the particular need.

Project Selection and Prioritization

Non-discretionary projects are automatically selected and prioritized based on externally driven schedules and needs. Most System Access projects fall into this category and may involve multi-year investments to meet proponent needs.

A system of project prioritization is applied that takes into account growth rates, safety, reliability and performance, condition and age, and other drivers internal or external to Milton Hydro. **Appendix F** includes a copy of a capital project summary template that Milton Hydro utilizes as a means of capturing project specific information.

Discretionary projects are selected and prioritized based on value and risk assessments for each project. Most System Renewal, System Service and General Plant projects fall into this category and some projects, such as System Renewal – Poles, may involve multi-year program investments to meet Asset Management needs. Reliability and safety are key considerations in project prioritization. In determining reliability priorities, MHDI considers the following characteristics of its distribution system:

- Failure of one 27.6 kV feeder line interrupts approximately 6.6% of total system load
- Overhead lines take hours to repair while underground cables take days

In this sense, when prioritizing individual projects, 27.6kV asset impacts will score relatively high in value and risk impact.

Project Pace

Project pace for System Access projects is generally determined by external schedules and needs. System Service and General Plant projects tend to be lumpy in nature and most are paced to begin and complete within a particular budget year. System Renewal projects tend to be multi-year programs and are paced to balance the Asset Management objective needs of the particular program with regard to available resources and managing the program impacts on the customer's bill.

d. Customer engagement - needs, priorities and preferences (5.4.2 d)

if not otherwise included in c) above, details of the mechanisms used by the distributor to engage customers for the purpose of identifying their needs, priorities and preferences (e.g. surveys, system data analytics, and analyses – by rate class – of customer feedback, inquiries, and complaints); the stages of the planning process at which this information is used; and the aspects of the DS Plan that have been particularly affected by consideration of this information;

As stated in **Customer engagement activities (5.4.1 f)**, MHDI uses a variety of activities to engage customers and determine their preferences for the development of MHDI's distribution system going forward. This aids in investment decision making. MHDI has noted that customer consultation is challenging for some issues, due to their complexity, however the customers do appreciate the opportunity to be heard especially on issues of a local nature.

Customer surveys provide a high level assessment of customer preferences with respect to service reliability and operational effectiveness. In 2014 MHDI engaged Utility Pulse to conduct a survey of its customers. Survey results are implicitly considered in the development of the asset management strategy, objectives and initial stages of annual plan development. This survey, the first of its kind conducted by MHDI, indicates that **cost**, **access to online information**, and **improved customer communications** are the key issues of interest to the customer.

In response to improving customer outage related communications, MHDI has developed an outage communications protocol. Outages are classified as 'small', 'large' or 'major' and information is received from/communicated to the customer via a number of channels:

1. Twitter
2. Phone System
3. Milton Hydro Web Site
4. Outage Distribution List
5. Milton Hydro's Answering Service (after normal office hours)

Depending on the scale of the outage and if the outage occurs during or after normal business hours, the various communication channels may be utilized to varying degrees. Of interest to note is that the Outage Distribution List links to Halton Region's 311 information system, thereby providing mass dissemination of information to all customers.

Meetings are held so that stakeholder feedback can be incorporated into the investment planning process in a timely manner. The meetings are designed for two way communication. MHDI's meeting goal is to update Council, as representatives of MHDI's customers, with respect to what is happening in their community with respect to MHDI, regulatory and ministerial directives, key MHDI projects to be undertaken in the upcoming year. The second goal of the meeting is to solicit Council feedback on electrical supply issues that are communicated to them from municipal residents and commercial establishments. Some information may be known through direct communication by customers to MHDI but Council members tend to accumulate specific consumer issues, viewpoints and overall perception of service through ongoing discussion with their constituents and this has value to MHDI.

Public Information Centres (PICs) are used to engage customers on notable issues that will benefit from direct discussion with MHDI's customers. . PIC obtained preferences generally inform the process and allows MHDI to address customer concerns and preferences directly or as an action item. Examples of PICs include:

- June 2013 PIC on 27.5kV/8.32kV Contact
- May 2013 PIC on Customer Owned Lines
- April 2014 PIC on Tree Trimming

The June 2013 and May 2013 PICs were informational; in nature and did not impact Milton Hydro's DSP. The April 2014 PIC resulted in a change to Milton Hydro's tree trimming policy as discussed in **MHDI asset management process (5.2.1 e)**.

In May of 2015 Milton Hydro consulted its various customers, by rate class, the consultation process and results are detailed in **Description of the consultations (5.2.2 a)**. There was no direct impact to the DSP as a result of the consultation process.

Municipal development planning consultation, specifically with respect to road widening projects or plant undergrounding projects is normally performed in advance of annual plan development as design parameters, work schedules, resource allocation, cost agreements all have to be arranged. Notice to relocate plant by a Road Authority can be given in as little as 60 days under the Public Service Works on Highways Act but normally more time is allowed (6 months minimum) to allow for the necessary plans and resources to be compiled.

As described in **Description of the consultations (5.2.2 a)** Milton Hydro Consults with the Town of Milton, Region of Halton and the development community to ensure their needs are identified and incorporated in Milton Hydro's plans. The impact of these groups on the 2016 portion of the DSP is detailed in **Table 34 – Capital Investment Specific Customer Preferences**. The anticipated budgetary impact over the forecast period is listed in the System Access category of **Table 1 – Capital Expenditures Forecast**.

MHDI provides comprehensive information on its website for residential and business customers providing education and information on the aspects of MHDI electricity supply. Specific consumer sections provide information on:

- Residential class issues (e.g. rates, conditions of service, smart meters, etc.)
- Business class issues (e.g. rates, conditions of service, smart meters, etc.)
- Energy Conservation (e.g. programs, tips and tools, FIT/microFIT programs, etc.)
- Industry information (.e.g. market overview, regulation and legislation, bill components, etc.)
- Electrical Safety (e.g. ESA alerts, trees on lines, safety school, etc.)
- Outage updates
- News updates

The website also provides MHDI contact information for the customers to address any inquiries that they may have.

Customer needs and preferences with respect to available CDM and DG programs are determined at an individual level in discussions with program participants. CDM information sessions are held to update consumers on programs and opportunities and to solicit program performance feedback from the consumers.

Table 39 – Stakeholder Needs, Interests and Perceptions

Stakeholders	Stakeholder Needs	Stakeholder Interests	Stakeholder Perception of Planning Risks
MHHI Corporation	Accurate external/internal information to set policy	Achieve mission vision and corporate objectives	Financial loss due to sub-optimization of operations; brand value deterioration
MHDI Employees	Safe and stable work environment; skills development	Long term productive relationship with employer	Employment instability; unsafe work environment
Shareholders	Stable rate of return	Safe long term investment	Financial and political pitfalls
IESO/OPA	Accurate load forecasting; meeting CDM targets for LTEP	Comprehensive utility forecasting process; LDC delivery of CDM programs	Inaccurate information contribution to Regional planning processes; CDM targets not met
IESO	Accurate real-time information and market rule compliance by market participants	LDC adherence to technical and communication protocols	Inaccurate or untimely information for market operations
HONI	Information to determine short, medium and long term local and regional infrastructure needs.	Coordination of transmission and distribution growth needs; LDC participation in Regional Planning	Inaccurate forecasts affecting resource commitments; Inaccurate information contribution to Regional planning processes
Generators	Stable market and ability to connect to distribution system	Clear rules and processes for connection	Distribution congestion affecting plant location and costs
Retailers	Reliable supply to customers; efficient business processes	Maximize contract revenues; customer relationship	Loss of revenue; loss of customers
Provincial Government	Efficient, low cost and reliable market	Reliable supply to stimulate growth and political goodwill	Localized negative political impact
OEB	Efficient, low cost and reliable market; regulatory compliance	Minimization of regulatory intervention	Regulatory intervention and political impact risks
Municipalities	Reliable supply to customers	Consultations on activities within municipal boundaries; visual aesthetics	Supply/reliability shortfalls affecting their constituents
Residential Customer	Reliable supply and low rates	Aesthetics	Supply/reliability shortfalls; price concerns
Small Commercial	Reliable supply and low rates	Rate stabilization or reduction	Supply/reliability shortfalls; price concerns affecting business plans
Large Commercial/Industrial	Reliable supply and low rates	Rate stabilization or reduction	Supply/reliability shortfalls; price concerns affecting business plans

e. REG investments (5.4.2 e)

if different from that described above, the method and criteria used to prioritise REG investments in accordance with the planned development of the system, including the impact if any of the distributor's plans to connect distributor-owned renewable generation project(s).

Milton Hydro does not propose to connect distributor-owned renewable generation projects during the forecast period. Milton Hydro prioritizes REG related investments using the same criteria applied to all other investments and in compliance with all applicable regulations including the DSC.

System Capability assessment for renewable energy generation (5.4.3)

to accommodate REG, including a summary of the distributor's load and renewable energy generation connection forecast by feeder/substation (where applicable); and information identifying specific network locations where constraints are expected to emerge due to forecast changes in load and/or connected renewable generation capacity.
In relation to renewable or other distributed energy generation connections, the information that must be considered by a distributor and documented in an application (where applicable) includes:

a. Applications from renewable generators > 10kW (5.4.3 a)

applications from renewable generators over 10kW for connection in the distributor's service area;

MHDI has connected 8 renewable energy generators to date ranging in size from 91kW to 250kW. A total of 1,841kW has been connected. A listing of currently connected FIT generators is shown in **table 40**.

Table 40 – List of FIT connections

Date	Installed Capacity (kW)
May 2012	250
November 2012	250
March 2013	250
August, 2013	250
November 2013	250
July 2014	250
November 2014	91.2
December 2014	250

b. Renewable generation connections anticipated 2016 -2020 (5.4.3 b)

the number and the capacity (in MW) of renewable generation connections anticipated over the forecast period based on existing connection applications, information available from the OPA and any other information the distributor has about the potential for renewable generation in its service area (where a distributor has a large service area, or two or more non-contiguous regions included in its service area, a regional breakdown should be provided);

Table 41 – Anticipated DGs 2016 - 2020

Street Name	Proposed Capacity (kW)
Bronte St S	140
Industrial Dr.	160
Canyon Rd	78
Canyon Rd	72
5th Line Nassagaweya	500
6th Line Nassagaweya	500

MHDI expects to connect 6 renewable energy generators in the 2016 – 2020 period for a total of 1450kW. These are all from the OPA FIT 2.0 Procurement Offer list. These are shown in **Table 41** above.

The IESO/OPA has released their FIT 3.0 Procurement Offer list. There are no FIT connections anticipated during the 2016 - 2020 period based on existing FIT 3.0 applications. It is expected that all other renewable energy generator connections will be at the micro-FIT level during this period.

c. Capacity to connect REGs (5.4.3 c)

the capacity (MW) of the distributor's distribution system to connect renewable energy generation located within the distributor's service area;

The MHDI distribution system (MS stations, feeders) has capacity in excess of the upstream HONI capacity allocations. Each 27.6kV feeder is rated at 600A capacity and has a planned loading level of 300A which is equivalent to approximately 14MW. At 50% REG penetration level, 7 MW would be available from each MHDI feeders for the connection of renewable generation, subject to upstream limitations.

d. REG connection constraints (5.4.3 d)

constraints related to the connection of renewable generation, either within the distributor's system or upstream system (host distributor and/or transmitter);

MHDI is supplied from the following transformer stations:

1. Palermo TS (HONI)
2. Tremaine TS (HONI)
3. Halton TS (HONI)
4. Fergus TS (HONI)
5. Glenorchy MTS (Oakville)

The HONI list of station capacity, on the HONI website, shows an approximate amount of generation that can be added at each bus or station owned by Hydro One. The list shows approximate values only and the actual capacity can only be determined by completing a Connection Impact Assessment. Information from the list related to HONI TS that supply MHDI are reproduced in the table below:

Table 42 – HONI TS station capacity for DGs

Station	Short Circuit Capacity (MW)	Thermal Capacity (MW)
Palermo TS	0	71.2
Tremaine TS – B bus	44.9	25.0
Tremaine TS – Y bus	47.3	25.0
Halton TS – J Bus	96.0	45.3
Halton TS – Q Bus	101.9	45.4
Fergus TS	276.7	96.1

Subject to specific Connection Impact Assessments, it appears that capacity to connect renewable generation is available at most of the HONI source stations. The two MHDI feeders fed from Palermo TS will be unable to connect renewable generation until such time as HONI short circuit constraints at Palermo TS are rectified.

Oakville Hydro has indicated that there are no station capacity constraints at Glenorchy MTS for the two Milton Hydro feeders connected.

e. Embedded distributor connection constraint impacts (5.4.3 e)

constraints for an embedded distributor that may result from the connections

There are no embedded distributors in MHDI's service territories.

Capital Expenditure Summary (5.4.4)

The Capital Expenditure Summary provides a 'snapshot' of MHDI's capital expenditures over a 10 year period, including five historical years and five forecast years.

For 'summary' purposes the entire costs of individual projects or activities are allocated to one of four investment categories on the basis of the primary (i.e. initial or 'trigger') driver of the investment. The investment categories are:

1. System Access
2. System Renewal
3. System Services
4. General Plant

The Capital Expenditure Summary is shown in **Table 43** and **Table 44** below:

Capital Expenditure Summary

Table 43 Capital Expenditures Actual ($' 000)					Table 44 Capital Expenditures Forecast ($'000)					
Category	**2011 (CGAAP)**	**2012 (CGAAP)**	**2013 (MIFRS)**	**2014 (MIFRS)**	**2015 (MIFRS)**	**2016**	**2017**	**2018**	**2019**	**2020**
	Actual	**Actual**	**Actual**	**Actual**	**Plan**	**Plan**	**Plan**	**Plan**	**Plan**	**Plan**
System Access	5,571	7,631	4,658	7,190	5,551	7,906	8,092	6,212	6,411	6,878
System Renewal	2,753	1,198	2,517	2,647	2,087	1,863	1,821	1,790	1,800	1,725
System Service	428	2,387	638	513	2,170	1,139	1,225	1,350	1,350	1,500
General Plant	500	343	880	4,896	6,659	720	701	711	676	696
Total	9,252	11,559	8,693	15,246	16,467	11,628	11,839	10,063	10,237	10,799

The information captured above in **Table 43** and **Table 44** has been reformatted and included below in **Table 45 – Table 2 Capital Expenditure Summary**.

Table 45 – OEB Chapter 5 Table 2 Capital Expenditure Summary

Appendix 2-AB

Table 2 - Capital Expenditure Summary from Chapter 5 Consolidated

First year of Forecast Period: *2016*

CATEGORY	Historical Period (previous plan[1] & actual)															Forecast Period (planned)				
	2011			2012			2013			2014			2015			2016	2017	2018	2019	2020
	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual[2]	Var					
	$ '000		%	$ '000		%	$ '000		%	$ '000		%	$ '000		%	$ '000				
System Access		5,571	--		7,631	--		4,658	--		7,190	--		5,552	--	7,906	8,092	6,212	6,411	6,878
System Renewal		2,753	--		1,198	--		2,517	--		2,647	--		2,087	--	1,863	1,821	1,790	1,800	1,725
System Service		428	--		2,387	--		638	--		513	--		2,171	--	1,139	1,225	1,350	1,350	1,500
General Plant		500	--		343	--		880	--		4,896	--		11,911	--	720	701	711	676	696
TOTAL EXPENDITURE	-	9,253	--	-	11,560	--	-	8,693	--	-	15,246	--	-	21,721	--	11,628	11,839	10,063	10,237	10,799
System O&M		$ 2,055	--		$ 2,210	--		$ 3,551	--		$ 3,002	--		$ 3,601	--	$ 3,735				

Notes to the Table:

1. Historical "previous plan" data is not required unless a plan has previously been filed
2. Indicate the number of months of 'actual' data included in the last year of the Historical Period (normally a 'bridge' year): 0

Explanatory Notes on Variances (complete only if applicable)

Notes on shifts in forecast vs. historical budgets by category

Notes on year over year Plan vs. Actual variances for Total Expenditures

Notes on Plan vs. Actual variance trends for individual expenditure categories

This is Milton Hydro's first DSP plan submission and as per Note 1 above historical "previous plan" data is not available.

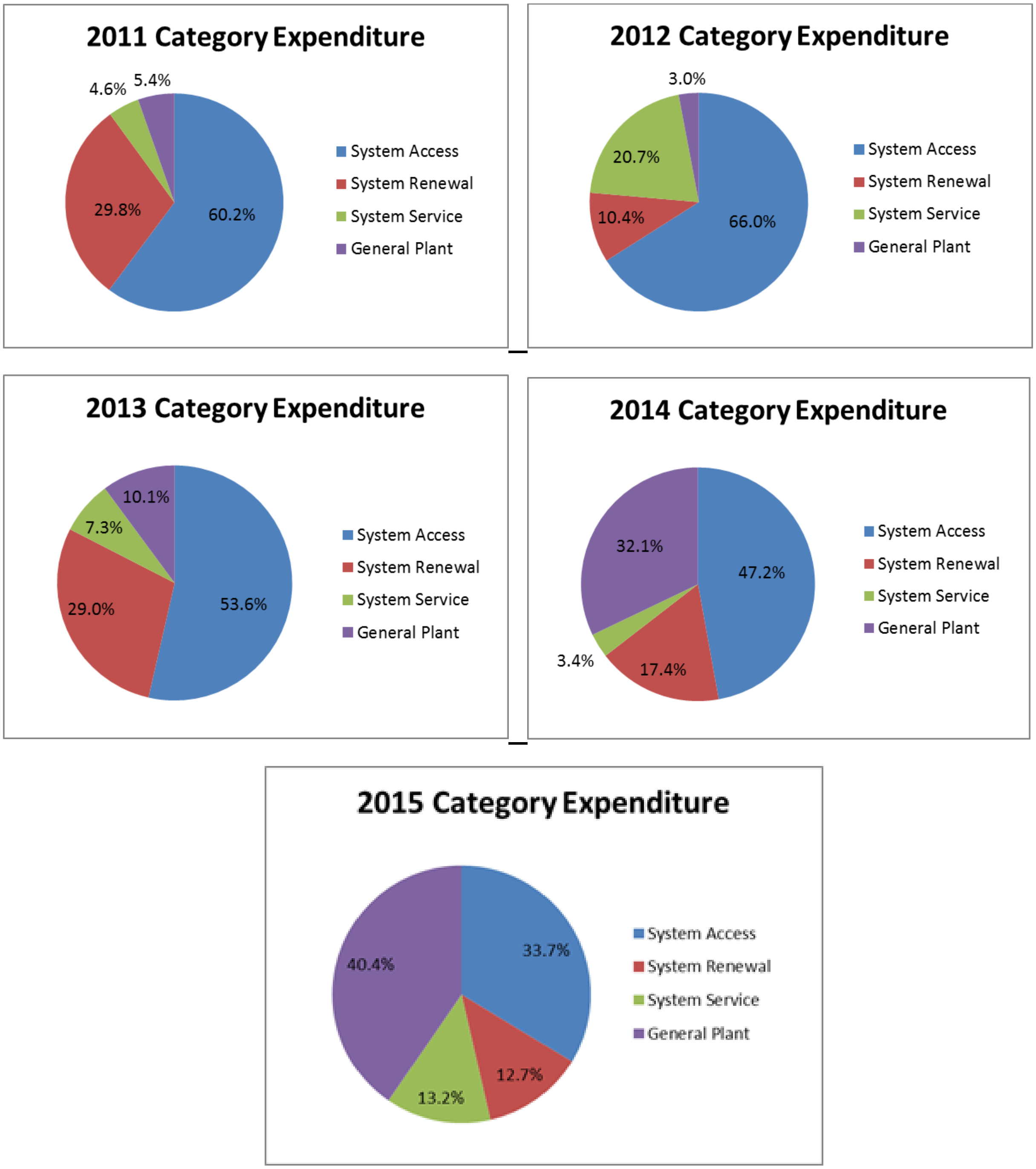


Figure 16 – 2011 – 2015 Capital Expenditure Charts

Justifying Capital Expenditures (5.4.5)

MHDI's Distribution System Plan delivers value to customers by controlling costs in relation to its proposed investments through appropriate optimization, prioritization and pacing of capital-related expenditures.

Overall Plan (5.4.5.1)

MHDI's distribution system plan is a portfolio of investments allocated across the four investment categories.

a. Comparative expenditures by category 2010 – 2015 (5.4.5.1 a)

comparative expenditures by category over the historical period

The comparative expenditures by category over the historical period are shown in **Table 43** in **Capital Expenditure Summary (5.4.4)** and in **Figure 16**.

System Access

MHDI's System Access investments are driven by others. MHDI is obligated to connect new load and new renewable generation. The scheduling of investments needs is usually coordinated to meet the needs of third parties. MHDI is also required to respond to the road authorities by obligations under the *Public Service Works on Highways Act.* The Act prescribes a formula for the apportionment of costs that allows for the road authority to contribute 50% of the "cost of labour and labour saving devices" towards the relocation costs.

Historical expenditure has varied between $4.6M and $7.9M.

Subdivision and development related cost varied between $2.1M and $3.5M over the historical period. The allocation of financial and human resources to System Access needs resulted in reduced spending for discretionary investments in the other categories.

Over the forecast period subdivision costs to remain consistent at approximately $3.8 million per year and total System Access costs to remain fairly consist with an average spend of $7.1 million over the forecast period – see **Table 44** in **Capital Expenditure Summary (5.4.4)** and **Key elements of the Distribution System Plan that affect its rates proposal (5.2.1 a)**.

System Renewal

System renewal is a mix of discretionary (planned end of life replacement) and non-discretionary (emergency replacement) investments. Discretionary investments are identified in the Asset Management Plan, prioritized and scheduled.

Historical expenditure has varied between $0.9M and $2.9M.

In 2013, the Bronte Meadows primary rebuild (~$1.1M) was the significant expense driver. This resulted in reduced spending in discretionary investments in the other categories.

Over the forecast period the System Access proposed spend remain fairly consist with an average spend of $1.8 million over the forecast period – see **Table 44** in **Capital Expenditure Summary (5.4.4)** and **Key elements of the Distribution System Plan that affect its rates proposal (5.2.1 a)**.

System Service

System Service investments are discretionary investments to provide for consistent service delivery and to meet operational objectives.

Historical expenditure has varied between $0.4M and $2.4M.

In 2012, new 27.6kV feeder egress (~$1.2M) work from Glenorchy TS was the significant investment expenditure.

Over the forecast period the System Service proposed spend remain fairly consist with an average spend of $1.3 million over the forecast period – see **Table 44** in **Capital Expenditure Summary (5.4.4)** and **Key elements of the Distribution System Plan that affect its rates proposal (5.2.1 a)**.

General Plant

General Plant investments are discretionary investments, not part of its distribution system (eg. fleet, tools, land, etc.), to provide system support and to improve operational efficiencies.

Historical expenditure has varied between $0.0M and $1.41M.

Significant general plant investments over the historical period included:

- Fleet vehicles ($0.3M – 2010)
- Fleet vehicles ($0.4M – 2012)
- Fleet vehicles ($0.5M – 2015)
- New building projected cost ($10.5M – 2015)

Over the forecast period the General Plant proposed spend remain fairly consist with an average spend of $0.7 million over the forecast period – see **Table 44** in **Capital Expenditure Summary (5.4.4)** and **Key elements of the Distribution System Plan that affect its rates proposal (5.2.1 a)**.

b. Impact of system investment on OM&A costs 2016 – 2020 (5.4.5.1 b)

the forecast impact of system investment on system O&M costs, including on the direction and timing of expected impacts;

System investments will result in:

- the addition of incremental plant (e.g. new poles, switchgear, transformers, etc.);
- the relocation/replacement of existing plant (e.g. road authority work);
- the replacement of end of life plant with new plant (e.g. poles, etc.)
- new/replacement system support expenditures (e.g. fleet, software, etc.)

In general, incremental plant additions (e.g. new pole line, etc.) will be integrated into the Asset Management system and will require incremental resources for ongoing OM&A purposes. This is expected to put upward pressure on OM&A costs.

Relocation/replacement of existing plant normally results in an asset being replaced with a similar one, so there would be little or no change to resources for ongoing OM&A purposes (ie. inspections still need to be carried out on a periodic basis as required per the Distribution System Code). There may be some slight life advantages when a working older piece of equipment is replaced with a newer one that would impact on OM&A repair related charges. Overall the plan system investments in this category are expected to put neutral pressure on OM&A costs.

Replacement of end of life plant with new plant will still require the allocation of resources for ongoing OM&A purposes. Repair would be the most significant OM&A activity impacted by new plant. Certain assets, such as poles, offer few opportunities for repair related activities and generally require replacement when deemed at end of normal life or critically damaged. Other assets such as direct buried cable offer opportunities for repair related activities (eg. splices) up to a point where further repairs are not warranted due to end of life conditions. New primary cable installed in duct replaces direct buried primary cable and is expected to provide higher reliability and life. This will shift response activity for a cable failure from repair (OM&A) to replacement (Capital). If assets approaching end of life are replaced at a rate that maintains equipment class average condition then one would expect little or no change to OM&A costs under no growth scenarios but would still see upward OM&A cost pressure on positive growth scenarios (more cumulative assets to maintain each year). Replacement rates that improve equipment class average condition could result in lowering certain maintenance activities costs (eg. pole testing, reactive repairs, etc). Overall this is expected to put downward pressure on OM&A repair related costs.

General plant expenditures (e.g. GIS, etc) are expected to provide a better overall understanding of MHDI's assets that will lead to more efficient and optimized design, maintenance and investment activities going forward. Increased data collection efforts (ie. testing program for poles) will be required which will increase pressure on OM&A costs. Collected data will be input into the GIS as attribute information for each piece of plant. Improved efficiencies will allow existing resources to partially compensate for growth related increases in OM&A activities.

In summary, the system investments will result in upward growth related and support related OM&A pressures, downward repair related OM&A pressures.

Table 46 – OM&A impacts for significant assets

Item	Growth impact on OM&A	Relocate impact on OM&A	Replace impact on OM&A	Support impact on OM&A
Poles	increase	neutral	neutral	increase
Cables	increase	N/A	decrease (repairs only)	neutral
UG Transformers	increase	N/A	neutral	neutral
UG Switchgear	increase	N/A	neutral	neutral
OH Transformers	increase	neutral	neutral	neutral

c. Investment drivers (5.4.5.1 c)

the 'drivers' of investments by category (referencing information provided in response to sections 5.3 and 5.4), including historical trend and expected evolution of each driver over the forecast period (e.g. information on the distributor's asset-related performance and performance targets relevant for each category, referencing information provided in section 5.2.3)

Milton Hydro has three key drivers of its capital investment:

1. obligation to connect a customer in accordance with Section 28 of the Electricity Act, 1998, Section 7 of Milton Hydro's Electricity Distribution Licence and the Distribution System Code.
2. the Town of Milton and the Region of Halton are investing in the widening of roads, installation of sewers and water which in many cases results in Milton Hydro being required to relocate existing distribution lines.
3. Milton Hydro's commitment to provide a safe and reliable supply of electricity to its customers.

The key investments drivers for each category are described below:

System Access

- Customer service requests - continued high growth in the Town of Milton requiring new customer connections (subdivisions)
- 3rd party infrastructure - planned road widening work by the Town of Milton/Halton Region requiring plant relocation
- Mandated service obligations -

Due to the continued high growth in the Town of Milton, System Access needs in the 2016 – 2020 period will continue to focus on new subdivision connections and plant relocation due to urbanization and intensification of the road network.

This work is not driven by 3rd party request with the 2016 investment requirements detailed in **Table 34 – Capital Investment Specific Customer Preferences** and discussed in **Capital Investments Customer Preferences/Technology/Innovation (5.4.1 h)**. Additional information on the drivers affecting System Access over the forecast period are discussed in **Key elements of the Distribution System Plan that affect its rates proposal (5.2.1 a)** where the Town of Milton's projected growth is reviewed.

System Renewal

- Failure risk - multiyear planned pole replacement program
- Functional obsolescence - 13.8 kV conversion of MS supplied areas to 27.6 kV supply
- High Performance risks - overhead line rebuilds

System renewal spending will continues to focus on converting the remaining 13.8kV supplied areas to 27.6kV supply and the planned proactive pole replacement program.

System Renewal investment drivers are discussed in **Asset Management Process (5.3)** and **Appendix J – 2016 – 2020 Asset Management Plan**. Asset Management objectives are reviewed in **Asset Management Objectives (5.3.1 a)** with linkages between RRFE Outcomes, Corporate Objectives and Asset Management objectives presented in **Table 17 – RRFE Outcomes -Corporate Objectives-Asset Management Linkage**. System Renewal projects are finalized based on Milton Hydro's planning cycle as depicted in **Figure 10 – MHDI Asset Management Planning Cycle** and which is supported by asset condition assessments, as discussed the **Asset Management process components (5.3.1 b).**

System Service

- System constraints – line extensions and feeder interconnections to accommodate grid load growth
- System operational objectives – projects to maintain system reliability and efficiency and implementation of MHDI's automation program

System service spending will continue to focus on the development of MHDI's infrastructure through installation of automated switches and sensors to improve system operations and efficiencies and the deployment of new feeders to access new TS capacity by 2020.

General Plant

General Plant investments form a small part of Milton Hydro's proposed investment plans over the forecast period $0.7 million over the forecast period – see **Table 44** in **Capital Expenditure Summary (5.4.4)** and

Key elements of the Distribution System Plan that affect its rates proposal (5.2.1 a). The primary drivers influencing the General Plant proposed spend will be:

- System Maintenance support – replacement of rolling stock; tools
- Business Operations efficiency – GIS development
- Non-system Physical plant – new Milton Hydro head office

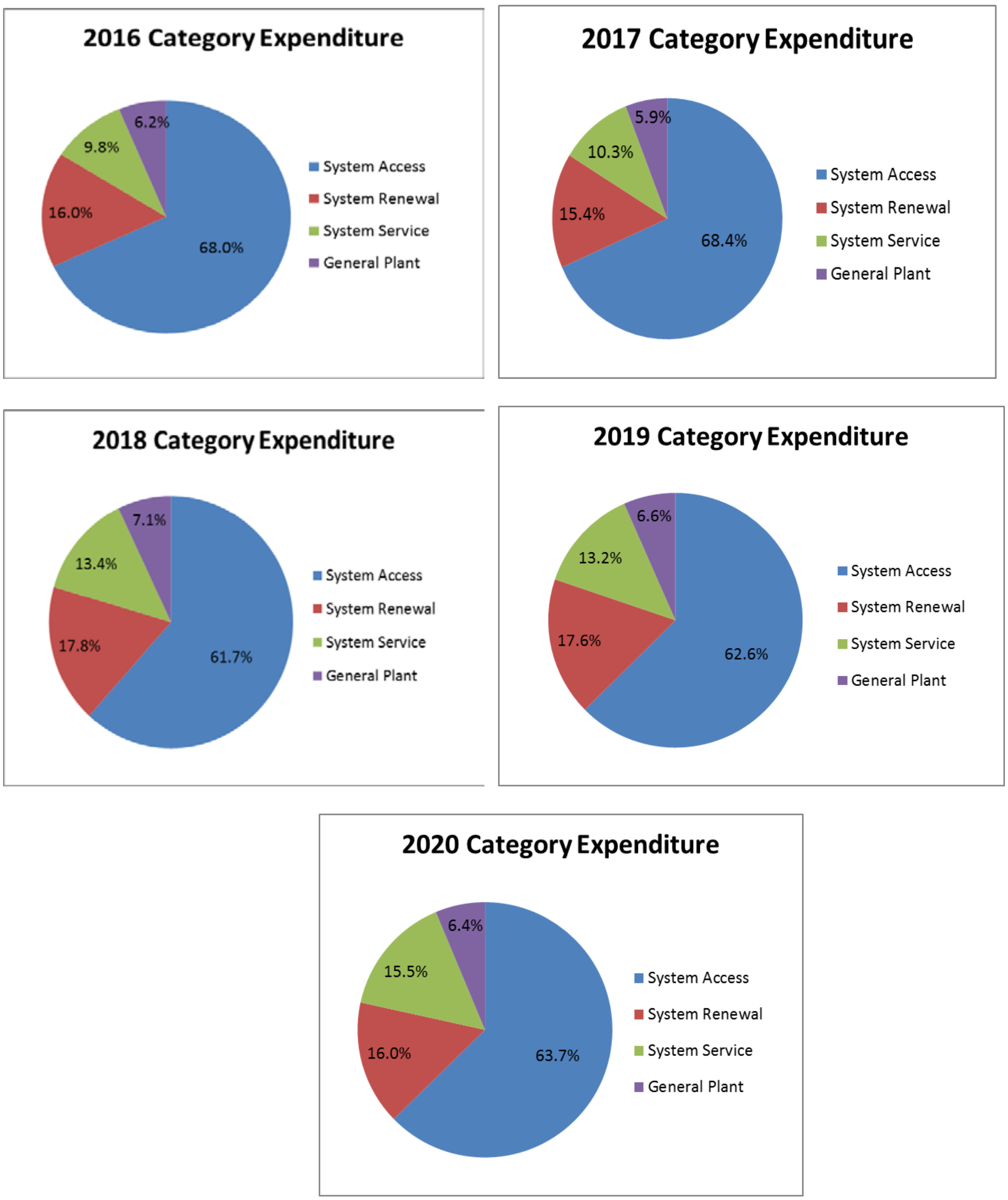


Figure 17 – 2016 – 2020 Capital Expenditure Charts

d. MHDI capability assessment (5.4.5.1 d)

information related to the distributor's system capability assessment (see section 5.4.3)

There is sufficient capacity on the MHDI distribution system to connect foreseeable DG needs over the investment period. It is not a significant driver for any of the four category expenditures.

Material Investments (5.4.5.2)

This section lists the material projects by year from 2016 to 2020. The materiality threshold is calculated on the basis of:

- 0.5% of Distribution Revenue Requirement

Based on the 2016 Distribution revenue requirement the materiality threshold is calculated as being $85,000.

All material projects have the following information provided:

A. General Information on the Project/Activity
B. Evaluation criteria for each project/activity
C. Category-specific information and analysis for each project/activity

A. General Information on the Project/Activity

1. total capital and where applicable, (non-capitalized) O&M costs proposed for recovery in rates
2. related customer attachments and load, as applicable
3. start date, in-service date and expenditure timing for 2016
4. the risks to the completion of the project or activity as planned and the manner in which such risks will be mitigated
5. comparative information on expenditures for equivalent projects/activities over the historical period, where available
6. information on total capital and OM&A costs associated with REG investment, if any, included in a project/activity; and a description of how the REG investment is expected to improve the system's ability to accommodate the connection of REG facilities

B. Evaluation criteria for each project/activity

Material investments are evaluated based on key regulatory outcomes as indicated below:

1. Efficiency, customer value and reliability
2. Safety
3. Cyber-security, privacy
4. Co-ordination, interoperability
5. Economic Development
6. Environmental benefits

C. Category-specific information and analysis for each project/activity

1. System Access
2. System Renewal
3. System Service
4. General Plant

2016 Material Projects

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Externally Initiated Plant Relocations**
Investment Category	System Access
Project Description	This category represents capital expenditures related to the relocation of Milton Hydro plant as required due to road widening/relocation projects. Milton Hydro follows the Public Service Works on Highways Act, 1990 and related regulations governing the recovery of costs related to road relocation works. Typically, the road authority contributes 50% of labour and labour saving devices. In some cases, the road authority may be required to contribute more (eg. plant is less than 5 years old, underground plant is required due to space restrictions etc.) reconstruction worowned plant installed within the existing municipal road allowance as a result of municipal

Sub Project Name	Project Description	Gross Capital	Customer Contribution	Net Capital	O&M Costs
ROH: Steeles Ave Grade Separation at CN Crossing West of Bronte St	Steeles Ave. road widening project by Halton Region, CN road crossing west of Bronte St. 7 MHDI poles and associated attachments to be relocated. Existing poles are 70', 2 circuit construction.	$90,600	$44,400	$46,200	$0
ROH: Steeles Ave. widening from Industrial Dr. to Martin St. (2 to 4 lanes)	Steeles Ave. road widening project by Halton Region, Industrial Dr to Martin St. (approximately 840 m). 31 MHDI poles and associated attachments to be relocated. Existing poles are 45' - 70', 2 circuit construction.	$284,500	$60,000	$224,500	$0
ROH: Britannia Rd from RR 25 to James Snow Parkway (2 to 4 lanes)	Britannia Rd. road widening project by Halton Region, RR 25 to James Snow Parkway (approximately 3.5 km). 106 MHDI poles and associated attachments to be relocated. The majority of existing poles are 45' - 50', 1 circuit construction. Relocated poles will be 65' construction, built with 2 circuits but have 3 circuit capability.	$1,004,800	$241,600	$763,200	$0
Town: Louis St Laurent from Yates Dr to RR25	Louis St Laurent is being designed as a four-lane thoroughfare with a centre median. This project will relocate MHDI plant as required for Phase 1 - Regional Road 25 to Yates Blvd constisting of: Construction of two traffic lanes, storm sewers, and curbs; Construction of a multi-purpose trail in the north boulevard; Construction of a bridge over 16 Mile Creek.	$32,700	$10,800	$21,900	$0
Town: Garden Lane	Garden Lane, approximately 400 m in length, is being reconstucted in 2017.	$133,000	$34,700	$98,300	$0
Town: Fifth Line from Derry Rd. to Louis St Laurent	Fifth Line, Derry Rd to Lous St Laurent (1.5 km) will undergo 2-lane Urbanization in 2017. Urbanization is the improvement of a road with ditches, to a road with curb and gutter, drained by storm sewers.	$415,200	$111,700	$303,500	$0
Town: Fifth Line from Louis St. Laurent to Britannia	Fifth Line, Lous St. Laurent to Britannia (1.5 km) will undergo 2-lane Urbanization in 2017. Urbanization is the improvement of a road with ditches, to a road with curb and gutter, drained by storm sewers.	$397,000	$103,500	$293,500	$0
ROH: Britannia Rd. from Tremaine to RR 25 (2 to 4 lanes)	Britannia Rd. road widening project by Halton Region, Tremaine to RR 25 (approximately 1.8 km). MHDI currently has no distribuion in this area except for a single phase pole line from Bronte St to the CN tracks, to service CN.	$403,300	$98,300	$305,000	$0
Town: Bronte St from Britannia to Louis St. Laurent	Bronte St from Britannia to Louis St. Laurent (1.5 km) will undergo widening and urbanization in 2016. Urbanization is the improvement of a road with ditches to a road with curb and gutter, drained by storm sewers. 30 MHDI poles and associated attachments will need to be relocated. The majority of existing poles are 55' - 60', 2 circuit construction. Relocated poles will be 60' construction, built with 2 circuits.	$389,900	$85,200	$304,700	$0
	Totals:	**$3,151,000**	**$790,200**	**$2,360,800**	**$0**

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$3,151,000
Customer Contribution	$790,200
Net Capital	$2,360,800
O&M Costs	$0 (not applicable)

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	Not applicable
Customer Load (peak kVA)	Not applicable

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 2016
Expected In-Service Date	December 2016
Expenditure Timing:	
Q1	$787,750
Q2	$787,750
Q3	$787,750
Q4	$787,750

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Project timing and schedule changes are dictated largely by the road authority. A Milton Hydro project manager is assigned to each project to ensure communication and coordination is maintained with the road authority project manager.

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	$1,320,147
2012	$2,760,557
2013	$726,522
2014	$2,051,301
2015	$824,640

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	Projects are driven by requests from Road Authority. Projects are nondiscretionary and are a required under the Public Service Works on Highways Act R.S.O. 1990
Related Objectives and/or Performance Targets	Customer service
Source and Nature of Information used to Justify Project	Required under the Public Service Works on Highways Act R.S.O. 1990
Secondary Driver (where applicable)	Not applicable
Related Objectives and Performance Targets	Not applicable
Source and Nature of Information used to Justify Project	Not applicable
Investment Priority (5.4.5.2.B.1.b)	Project is nondiscretionary. Schedule is coordinated with the Road Authority.
Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	The relocation of distribution assets is mandatory and is based on the proposed road design. Milton Hydro reviews alternative relocation solutions at the design stage and endeavours to propose the most economical design in the interest of all affected parties. The road authority may request adjustments as required based on the impact to the road design and other road allowance users, if technically feasible and at their expense.
Effect of Investment on System Operation Efficiency and Cost Effectiveness	System operation efficiency is maintained or improved due to newer assets installed to current standards. The investment will also result in readiness of relocated poles for future circuits to handle growth needs, if required.
Net benefits accruing to customers	Improved system reliability, Improved system service
Impact of Investment on Reliability Performance	Reliability performance is maintained or improved due to newer assets installed to current standards resulting in improved severe weather withstand.

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	Relocated assets are installed according to current safety standards in compliance with Ontario Regulation 22/04. Health and safety protections and performance levels are expected to be maintained or improved.

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	Not applicable

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Projects are coordinated by the road authority representative with consideration given to all road allowance users. Assets are installed according to current standards
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Future technological functionality and operational requirements are considered and included in the design of relocated assets where feasible and reasonable and in accordance with corporate policy

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Roadway widening projects support the municipal and regional economic strategic plans

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Access

Justification of Project (5.4.5.2.C.a)

Factors Affecting the Timing/ Priority of Implementing the Project (5.4.5.2.C.a – 1st bullet)	Project timing is dictated largely by the road authority. A Milton Hydro project manager is assigned to each project to ensure communication and coordination is maintained with the road authority project manager
Factors Relating to Customer Preferences or Input from Customers and other Third Parties (5.4.5.2.C.a – 2nd bullet)	Project scope is determined by the road authority
Factors Affecting the Final Costs of the Project (5.4.5.2.C.a – 3rd bullet)	Project scope is determined by the road authority

How Controllable Costs have been Minimized (5.4.5.2.C.a – 4th bullet)	Projects are tendered to Milton Hydro approved contractors and awarded based on a competitive bid process and using standardized material
Other Planning Objectives met by the Project (5.4.5.2.C.a – 5th bullet)	Future growth capability
Technically feasible project options (5.4.5.2.C.a – 6th bullet)	Milton Hydro reviews alternative relocation solutions at the design stage and endeavours to propose the most economical design in the interest of all affected parties.
Summary of options analysis (5.4.5.2.C.a – 7th bullet)	Not applicable
Results of the 'Final Economic Evaluation' carried out as per section 3.2 of the DSC (5.4.5.2.C.a – 8th bullet)	Not applicable
REG Investment - Nature and Magnitude of System Impacts, Costs and Cost Recovery (5.4.5.2.C.a. 9th bullet)	Not applicable

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**System Expansions (Subdivision Development - 1,500 units)**
Investment Category	System Access
Project Description	This project category represents the construction of new facilities in order to connect new subdivisions to the main distribution system. New facilities include primary and secondary cables in ducted system, transformers and switching equipment.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$3,780,000
Customer Contribution	$1,993,700
Net Capital	$1,786,300
O&M Costs	$0 (not applicable)

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	1500
Customer Load (peak kVA)	5 MW

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 4, 2016
Expected In-Service Date	December 30, 2016
Expenditure Timing:	
Q1	$945,000
Q2	$945,000
Q3	$945,000
Q4	$945,000

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Milton Hydro enters into a Subdivision Agreement with the developer prior to project commencement. Deposits are collected at the onset of the project to ensure there is no financial risk to Milton Hydro. Project timelines are also established at the onset of the project.

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs

2011	$3,585,489
2012	$4,244,841
2013	$2,585,920
2014	$4,229,969
2015	$3,780,000

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	Projects are driven by developer demand and are nondiscretionary
Related Objectives and/or Performance Targets	Customer Service
Source and Nature of Information used to Justify Project	Obligation to connect customers as per Distribution System Code
Secondary Driver (where applicable)	Not applicable
Related Objectives and Performance Targets	Not applicable
Source and Nature of Information used to Justify Project	Not applicable

Investment Priority (5.4.5.2.B.1.b)	Project is nondiscretionary
Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	Subdivision projects are driven by developer requests. Milton Hydro reviews supply point alternatives at the design stage and proposes the most economical design with consideration to future expansion requirements
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Not applicable
Net benefits accruing to customers	Not applicable
Impact of Investment on Reliability Performance	Not applicable

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	New assets are installed according to current safety standards in compliance with Ontario Regulation 22/04.

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	Not applicable

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Not applicable
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Not applicable

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Connection of new services supports municipal economic growth

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Access

Justification of Project (5.4.5.2.C.a)

Factors Affecting the Timing/ Priority of Implementing the Project (5.4.5.2.C.a – 1st bullet)	Projects are driven by developer demand and are nondiscretionary
Factors Relating to Customer Preferences or Input from Customers and other Third Parties (5.4.5.2.C.a – 2nd bullet)	Developers have the option to design and construct the expansion with final approval by Milton Hydro.
Factors Affecting the Final Costs of the Project (5.4.5.2.C.a – 3rd bullet)	Cost recovery from the developer is governed by the economic evaluation process as prescribed in the Distribution System Code
How Controllable Costs have been Minimized (5.4.5.2.C.a – 4th bullet)	Standardized processes have been established to design, construct, inspect and connect system expansions driven by developers
Other Planning Objectives met by the Project (5.4.5.2.C.a – 5th bullet)	Provision for future development is included in the project design, as required
Technically feasible project options (5.4.5.2.C.a – 6th bullet)	Milton Hydro reviews supply point alternatives at the design stage and proposes the most economical design with consideration to future expansion requirements
Summary of options analysis (5.4.5.2.C.a – 7th bullet)	Not applicable
Results of the 'Final Economic Evaluation' carried out as per section 3.2 of the DSC (5.4.5.2.C.a – 8th bullet)	The economic evaluation process as prescribed in the Distribution System Code is completed for each request for system expansion. The final economic evaluation is calculated based on actual project costs at project completion.
REG Investment - Nature and Magnitude of System Impacts, Costs and Cost Recovery (5.4.5.2.C.a. 9th bullet)	Not applicable

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Meters**
Investment Category	System Access
Project Description	This project includes the installation and replacement of Milton Hydro owned retail and wholesale metering assets. Meter asset installations are required for new or upgraded customer connections. Meter replacements include the proactive replacement of metering equipment that is deemed to require replacement in accordance with Measurement Canada standards and the reactive replacement of meter equipment failures.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$293,926
Customer Contribution	$0
Net Capital	$293,926
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	Various, driven by demand
Customer Load (peak kVA)	Not applicable

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 4, 2016
Expected In-Service Date	December 30, 2016
Expenditure Timing:	
Q1	$73,481
Q2	$73,482
Q3	$73,481
Q4	$73,482

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Meter equipment inventories are reviewed regularly to ensure availability. Work schedules are reviewed on a regular basis to ensure all required meter replacements are completed.

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs

2011	$96,003
2012	$526,610
2013	$794,329
2014	$433,062
2015	$285,365

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	Meter replacements are driven by regulatory obligations; Meter installations are driven by customer demand and are nondiscretionary
Related Objectives and/or Performance Targets	Customer Service
Source and Nature of Information used to Justify Project	Obligation to connect customers as per Distribution System Code; obligation to satisfy Measurement Canada requirements
Secondary Driver (where applicable)	Not applicable
Related Objectives and Performance Targets	Not applicable
Source and Nature of Information used to Justify Project	Not applicable

Investment Priority (5.4.5.2.B.1.b)	Project is nondiscretionary
Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	Not applicable
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Not applicable
Net benefits accruing to customers	Not applicable
Impact of Investment on Reliability Performance	Not applicable

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	New assets are installed according to current safety standards in compliance with Ontario Regulation 22/04.

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	Not applicable

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Not applicable
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Not applicable

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Connection of new services supports municipal economic growth

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Access

Justification of Project (5.4.5.2.C.a)

Factors Affecting the Timing/ Priority of Implementing the Project (5.4.5.2.C.a – 1st bullet)	Projects are driven by regulatory obligations and customer demand and are nondiscretionary
Factors Relating to Customer Preferences or Input from Customers and other Third Parties (5.4.5.2.C.a – 2nd bullet)	Not applicable
Factors Affecting the Final Costs of the Project (5.4.5.2.C.a – 3rd bullet)	Established processes and procedures as well as project management of new customer installations are used to coordinate the completion of customer required work with Milton Hydro required work in an efficient manner.
How Controllable Costs have been Minimized (5.4.5.2.C.a – 4th bullet)	Standardized processes have been established to design, construct, inspect and install meter equipment for new or upgraded customer connections
Other Planning Objectives met by the Project (5.4.5.2.C.a – 5th bullet)	Not applicable
Technically feasible project options (5.4.5.2.C.a – 6th bullet)	Not applicable
Summary of options analysis (5.4.5.2.C.a – 7th bullet)	Not applicable
Results of the 'Final Economic Evaluation' carried out as per section 3.2 of the DSC (5.4.5.2.C.a – 8th bullet)	Not applicable
REG Investment - Nature and Magnitude of System Impacts, Costs and Cost Recovery (5.4.5.2.C.a. 9th bullet)	Not applicable

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Customer Connections**
Investment Category	System Access
Project Description	This project includes capital expenditures on the overhead and underground primary and secondary systems as required to service new or upgraded commercial / industrial customer connections and residential customer connections that lie along the existing Milton Hydro distribution system. This project does not include customer connections in new subdivisions.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$681,587
Customer Contribution	$681,587
Net Capital	$0
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	Various, as determined by customer demand
Customer Load (peak kVA)	as determined by customer demand

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 4, 2016
Expected In-Service Date	December 30, 2016
Expenditure Timing:	
Q1	$170,396
Q2	$170,397
Q3	$170,397
Q4	$170,497

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Milton Hydro issues an Offer to Connect to all customers requesting new/upgraded services. Deposits are collected at the onset of the project to mitigate financial risk to Milton Hydro. Project timelines are also established at the onset of the project.

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs

2011	$568,796
2012	$99,119
2013	$551,459
2014	$476,036
2015	$661,735

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	Projects are driven by customer demand and are nondiscretionary
Related Objectives and/or Performance Targets	Customer Service
Source and Nature of Information used to Justify Project	Obligation to connect customers as per Distribution System Code
Secondary Driver (where applicable)	Not applicable
Related Objectives and Performance Targets	Not applicable
Source and Nature of Information used to Justify Project	Not applicable

Investment Priority (5.4.5.2.B.1.b)	Project is nondiscretionary
Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	Milton Hydro reviews supply point alternatives at the design stage and proposes the most economical design with consideration to future expansion requirements
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Not applicable
Net benefits accruing to customers	Not applicable
Impact of Investment on Reliability Performance	Not applicable

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	New assets are installed according to current safety standards in compliance with Ontario Regulation 22/04.

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	Not applicable

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Not applicable
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Not applicable

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Connection of new services supports municipal economic growth

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Access

Justification of Project (5.4.5.2.C.a)

Factors Affecting the Timing/ Priority of Implementing the Project (5.4.5.2.C.a – 1st bullet)	Projects are driven by customer demand and are nondiscretionary
Factors Relating to Customer Preferences or Input from Customers and other Third Parties (5.4.5.2.C.a – 2nd bullet)	Milton Hydro works with the customer's representative to design a mutually acceptable service connection, with final approval by Milton Hydro.
Factors Affecting the Final Costs of the Project (5.4.5.2.C.a – 3rd bullet)	Final costs of the project are largely dependent on cost of materials at the time. Cost recovery from the customer is established in the Offer to Connect.
How Controllable Costs have been Minimized (5.4.5.2.C.a – 4th bullet)	Established processes and procedures as well as project management of new customer installations are used to coordinate the completion of customer required work with Milton Hydro required work in an efficient manner.
Other Planning Objectives met by the Project (5.4.5.2.C.a – 5th bullet)	Provision for future development is included in the project design, as required
Technically feasible project options (5.4.5.2.C.a – 6th bullet)	Milton Hydro reviews supply point alternatives at the design stage and proposes the most economical design with consideration to future expansion requirements
Summary of options analysis (5.4.5.2.C.a – 7th bullet)	Not applicable
Results of the 'Final Economic Evaluation' carried out as per section 3.2 of the DSC (5.4.5.2.C.a – 8th bullet)	Not applicable
REG Investment - Nature and Magnitude of System Impacts, Costs and Cost Recovery (5.4.5.2.C.a. 9th bullet)	Not applicable

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Pole Replacement Program**
Investment Category	System Renewal
Project Description	As part of its Asset Management Program, MHDI performs pole testing to evaluate the condition and projected life of its poles. Poles that have been in service for more than 25 years are tested once in a 3 year cycle (approximatley one third per year). Poles identified as at end-of-life may fail unexpectedy or be in an imminent position to fail and are replaced proactively, as required, in order to maintain the safety and integrity of the distribution system. This project includes provision for the replacement of 100 poles as identified from the 2015 pole testing program.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$500,000
Customer Contribution	$0
Net Capital	$500,000
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	Not applicable
Customer Load (peak kVA)	Not applicable

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 4, 2016
Expected In-Service Date	December 30, 2016
Expenditure Timing:	
Q1	$125,000
Q2	$125,000
Q3	$125,000
Q4	$125,000

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Design and construction schedules are reviewed on a regular basis to ensure all required pole replacements are completed

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	$306,783
2012	$171,529
2013	$211,296
2014	$303,464
2015	$375,000

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	The main driver for this project is safety. Poles identified as at end-of-life may fail unexpectedy or be in an imminent position to fail and are replaced proactively, as required, in order to maintain the safety and integrity of the distribution system.
Related Objectives and/or Performance Targets	System reliability, improved system performance
Source and Nature of Information used to Justify Project	Annual pole testing and inspection program results
Secondary Driver (where applicable)	Not applicable
Related Objectives and Performance Targets	Not applicable
Source and Nature of Information used to Justify Project	Not applicable
Investment Priority (5.4.5.2.B.1.b)	Planned pole replacements are given a high priority. Failure of these assets poses a safety risk to Milton Hydro employees and the general public. Failure also negatively impacts service reliability to customers supplied from the overhead distribution system

Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	Not applicable
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Replaced assets are installed to current standards (eg. Standard framing resulting in improved working clearances)
Net benefits accruing to customers	Reduced safety risk to general public
Impact of Investment on Reliability Performance	Improved System Reliability due to reduced risk of asset failure

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	New assets are installed according to current safety standards in compliance with Ontario Regulation 22/04. Reduced safety risk to employees and general public

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	Not applicable

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Not applicable
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Not applicable

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Not applicable

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Renewal

Relationship between the Characteristics of Targeted Assets and the Consequences of Asset Failure (5.4.5.2.C.b-1st bullet)

Asset Performance Targets and Asset Lifecycle Optimization Policies and Practices (5.4.5.2.C.b 1st bullet, 1st dash)	The majority of poles identified for replacement have decayed as expected and reached the typical end of life age for a pole. Those that haven't reached end of life age have been identified due to damage due to foreign interference such as insect infestation or woodpecker damage. Poles are identified in accordance with Milton Hydro's asset management plan. To replace an asset at the end of its lifecycle is ideal in achieving asset lifecycle optimization.
Asset Condition Relative to Typical Life Cycle (5.4.5.2.C. b 1st bullet, 2nd dash)	The majority of poles identified for replacement are in a deteriorated condition as expected of a pole at the end of a typical life cycle
Number of Customers in Each Class Potentially Affected (5.4.5.2.C. b 1st bullet, 3rd dash)	The number of customers affected by a pole failure can range from zero to as many as 6000 depending on the failure mode and the type of equipment supported by the pole.
Quantitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 4th dash)	The duration of a customer interruption caused by a pole failure can range from a momentary interruption (less than 1 minute) to several hours depending on the work required to restore power. Typically however, outages caused by pole failures are of a longer duration. The risk of a customer interruption occurring as a result of a pole failure is high due to the nature of equipment supported by the pole.
Qualitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 5th dash)	Qualitative impact includes loss of customer confidence and company reputation due to a reduction in system reliability and perceived mismanagement of assets. The risk of the loss of customer confidence is high and growing as the ease to communicate via social media increases
Value of Customer Impact (5.4.5.2.C. b 1st bullet, 6th dash)	high

Other Factors Affecting Project Timing (5.4.5.2.C.b 2nd bullet)

Not applicable

Consequences for System O&M costs (5.4.5.2.C.b 3rd bullet)

Not applicable

Reliability and Safety Factors (5.4.5.2.b 4th bullet)

System reliability and safety are positively impacted by replacing end of life assets on a proactive basis

Analysis of Project Benefits and Timing (5.4.5.2.C.b 5th bullet)

Not applicable

Like for Like Renewal Analysis (5.4.5.2.C.b 6nd bullet)

Not applicable

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Porcelain Replacement Program**
Investment Category	System Renewal
Project Description	Porcelain switches and insulatores have reached end of life status which can result in unsafe operation. Cracks and fractures in the switch assembly are not readily visible and can break during switching operations by line staff. This is a multi-year planned program that covers the replacement of overhead porcelain switches and insulators. Investment results in elimination of potential safety and reliability concerns. Proactive replacement is less costly than reactive replacement. Customer outage time/cost minimized/eliminated with proactive replacement. This project includes provision to replace approximately 150 switches.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$150,000
Customer Contribution	$0
Net Capital	$150,000
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	Not applicable
Customer Load (peak kVA)	Not applicable

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 4, 2016
Expected In-Service Date	December 30, 2016
Expenditure Timing:	
Q1	$37,500
Q2	$37,500
Q3	$37,500
Q4	$37,500

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Construction schedules are reviewed on a regular basis to ensure all required switch replacements are completed

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	$416,091
2012	$206,036
2013	$180,040
2014	$355,197
2015	$150,000

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	The main driver for this project is safety. Equipment identified as at end-of-life may fail unexpectedy or be in an imminent position to fail and are replaced proactively in order to maintain the safety and integrity of the distribution system.
Related Objectives and/or Performance Targets	System reliability, improved system performance
Source and Nature of Information used to Justify Project	Annual replacement program to proactively replace porcelain switches and insulators at or near end-of-life
Secondary Driver (where applicable)	Not applicable
Related Objectives and Performance Targets	Not applicable
Source and Nature of Information used to Justify Project	Not applicable
Investment Priority (5.4.5.2.B.1.b)	Planned switch replacements are given a high priority. Failure of these assets poses a safety risk to Milton Hydro employees and the general public. Failure also negatively impacts service reliability to affected customers

Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	Not applicable
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Replaced assets are installed to current standards using standard material. Operation efficiency is improved due to reduced risk of asset failure during operation
Net benefits accruing to customers	Reduced safety risk to general public
Impact of Investment on Reliability Performance	Improved System Reliability due to reduced risk of asset failure

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	New assets are installed according to current safety standards in compliance with Ontario Regulation 22/04. Reduced safety risk to employees and general public

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	Not applicable

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Not applicable
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Not applicable

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Not applicable

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Renewal

Relationship between the Characteristics of Targeted Assets and the Consequences of Asset Failure (5.4.5.2.C.b-1st bullet)

Asset Performance Targets and Asset Lifecycle Optimization Policies and Practices (5.4.5.2.C.b 1st bullet, 1st dash)	Switches and insulators identified for replacement are old porcelain types which have reached their end of useful life. Historically porcelain had been the standard material for this type of switch. Over time, however, contamination build up and electrical tracking have weakened the porcelain insulators, leading to cracking and breakage that create safety and system reliability risks.
Asset Condition Relative to Typical Life Cycle (5.4.5.2.C. b 1st bullet, 2nd dash)	Switches and insulators identified for replacement have reached their end of useful life and are typically at their end of life age
Number of Customers in Each Class Potentially Affected (5.4.5.2.C. b 1st bullet, 3rd dash)	The number of customers typically affected by a switch failure is less than 5 as these switches commonly supply rural properties. However, occasionally up to 1200 or more customers can be affected if the failure causes a feeder breaker to trip, depending on system configuration at the time of the fault. The number of customers affected by an insulator failure would depend on the location of the failure, potential thousands of customers could be impacted.
Quantitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 4th dash)	The duration of a customer interruption caused by a switch failure is typically 1-2 hours.
Qualitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 5th dash)	Qualitative impact includes loss of customer confidence and company reputation due to a reduction in system reliability and perceived mismanagement of assets.
Value of Customer Impact (5.4.5.2.C. b 1st bullet, 6th dash)	High

Other Factors Affecting Project Timing (5.4.5.2.C.b 2nd bullet)

Not applicable

Consequences for System O&M costs (5.4.5.2.C.b 3rd bullet)

Not applicable

Reliability and Safety Factors (5.4.5.2.b 4th bullet)

System reliability and safety are positively impacted by replacing end of life assets on a proactive basis

Analysis of Project Benefits and Timing (5.4.5.2.C.b 5th bullet)

Not applicable

Like for Like Renewal Analysis (5.4.5.2.C.b 6nd bullet)

Not applicable

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Derry Road, Trafalgar to Eighth Line, Overhead Asset Renewal**
Investment Category	System Renewal
Project Description	Milton Hydro's records indicate a portion of this pole line is at or near their end of useful life. The renwal of this section of poles will also provide a backup supply to a developing area currently supplied radially along a 5 km section of pole line on Eighth Line including a recent connection of a high voltage service to a customer owned substation in 2015. Install approximately 20 MHDI poles and associated attachments. The majority of the poles will be 60', 1 circuit construction with provision for a 2nd circuit.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$155,000
Customer Contribution	$0
Net Capital	$155,000
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	38, includes 1 customer owned substation
Customer Load (peak kVA)	1000 kVA

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	September 2016
Expected In-Service Date	November 2016
Expenditure Timing:	
Q1	
Q2	
Q3	$20,000
Q4	$135,000

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Design and construction schedules are reviewed on a regular basis to ensure all required pole line work is completed

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	Not applicable
2012	Not applicable
2013	Not applicable
2014	Not applicable
2015	Not applicable

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	The main driver for this project is safety. Poles identified as at end-of-life may fail unexpectedy or be in an imminent position to fail and are replaced proactively, as required, in order to maintain the safety and integrity of the distribution system.
Related Objectives and/or Performance Targets	System reliability, improved system performance
Source and Nature of Information used to Justify Project	Annual pole testing and inspection program results
Secondary Driver (where applicable)	The secondary driver for this project is reliability. This project will provide a backup supply to customers fed radially along a 5 km section of pole line with no backup in the event of a loss of supply.
Related Objectives and Performance Targets	Not applicable
Source and Nature of Information used to Justify Project	Not applicable
Investment Priority (5.4.5.2.B.1.b)	Planned pole replacements are given a high priority. Failure of these assets poses a safety risk to Milton Hydro employees and the general public.

Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	Not applicable
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Replaced assets are installed to current standards (eg. Standard framing resulting in improved working clearances). System operation efficiency will be improved as the new line will provide an alternative supply path to area customers in the event of an outage
Net benefits accruing to customers	Reduced safety risk to general public, Improved system reliability
Impact of Investment on Reliability Performance	Improved System Reliability due to reduced risk of asset failure

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	New assets are installed according to current safety standards in compliance with Ontario Regulation 22/04. Reduced safety risk to employees and general public.

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	Not applicable

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Not applicable
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Not applicable

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Not applicable

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Renewal

Relationship between the Characteristics of Targeted Assets and the Consequences of Asset Failure (5.4.5.2.C.b-1st bullet)

Asset Performance Targets and Asset Lifecycle Optimization Policies and Practices (5.4.5.2.C.b 1st bullet, 1st dash)	The majority of poles identified for replacement have decayed as expected and reached the typical end of life age for a pole. Those that haven't reached end of life age have been identified as deficient in pole height and class compared to current standards. Poles are identified in accordance with Milton Hydro's asset management plan. To replace an asset at the end of its lifecycle is ideal in achieving asset lifecycle optimization.
Asset Condition Relative to Typical Life Cycle (5.4.5.2.C. b 1st bullet, 2nd dash)	The majority of poles identified for replacement are in a deteriorated condition as expected of a pole at the end of a typical life cycle
Number of Customers in Each Class Potentially Affected (5.4.5.2.C. b 1st bullet, 3rd dash)	The number of customers affected by a pole failure in this section can be 400 or more, depending on the system configuration. This section of pole line supports a 27.6 kV main feeder, therefore an asset failure could cause the substation supply breaker to trip, affecting all customers connected to the feeder.
Quantitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 4th dash)	The duration of a customer interruption caused by a pole failure can range from a momentary interruption (less than 1 minute) to several hours depending on the work required to restore power. Typically however, outages caused by pole failures are of a longer duration. The risk of a customer interruption occurring as a result of a pole failure is high due to the nature of equipment supported by the pole.
Qualitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 5th dash)	Qualitative impact includes loss of customer confidence and company reputation due to a reduction in system reliability and perceived mismanagement of assets. The risk of the loss of customer confidence is high and growing as the ease to communicate via social media increases
Value of Customer Impact (5.4.5.2.C. b 1st bullet, 6th dash)	high

Other Factors Affecting Project Timing (5.4.5.2.C.b 2nd bullet)

Not applicable

Consequences for System O&M costs (5.4.5.2.C.b 3rd bullet)

Not applicable

Reliability and Safety Factors (5.4.5.2.b 4th bullet)

System reliability and safety are positively impacted by replacing end of life assets on a proactive basis

Analysis of Project Benefits and Timing (5.4.5.2.C.b 5th bullet)

Not applicable

Like for Like Renewal Analysis (5.4.5.2.C.b 6nd bullet)

Not applicable

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Sixth Line Nassagaweya South of 25 Sideroad, Overhead Asset Renewal**
Investment Category	System Renewal
Project Description	Spatial analysis of pole attribute data and subsequent field inspections have identified this section of poles with the majority of poles at or near their end of useful life. The majority of poles are 35' class 5, single circuit construction and do not meet current construction standards.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$322,000
Customer Contribution	$0
Net Capital	$322,000
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	20
Customer Load (peak kVA)	100 kVA

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	April 4, 2016
Expected In-Service Date	May 27, 2016
Expenditure Timing:	
Q1	$0
Q2	$322,200
Q3	$0
Q4	$0

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Design and construction schedules are reviewed on a regular basis to ensure all required pole replacements are completed

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	Not applicable
2012	Not applicable
2013	Not applicable
2014	Not applicable
2015	Not applicable

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	The main driver for this project is safety. Poles identified as at end-of-life may fail unexpectedy or be in an imminent position to fail and are replaced proactively, as required, in order to maintain the safety and integrity of the distribution system.
Related Objectives and/or Performance Targets	System reliability, improved system performance
Source and Nature of Information used to Justify Project	Annual pole testing and inspection program results
Secondary Driver (where applicable)	Not applicable
Related Objectives and Performance Targets	Not applicable
Source and Nature of Information used to Justify Project	Not applicable
Investment Priority (5.4.5.2.B.1.b)	Planned pole replacements are given a high priority. Failure of these assets poses a safety risk to Milton Hydro employees and the general public. Failure also negatively impacts service reliability to customers supplied by the pole line

Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	Not applicable
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Replaced assets are installed to current standards (eg. Standard framing resulting in improved working clearances)
Net benefits accruing to customers	Reduced safety risk to general public
Impact of Investment on Reliability Performance	Improved System Reliability due to reduced risk of asset failure

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	New assets are installed according to current safety standards in compliance with Ontario Regulation 22/04. Reduced safety risk to employees and general public.

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	Not applicable

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Not applicable
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Not applicable

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Not applicable

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Renewal

Relationship between the Characteristics of Targeted Assets and the Consequences of Asset Failure (5.4.5.2.C.b-1st bullet)

Asset Performance Targets and Asset Lifecycle Optimization Policies and Practices (5.4.5.2.C.b 1st bullet, 1st dash)	The majority of poles identified for replacement have decayed as expected and reached the typical end of life age for a pole. Those that haven't reached end of life age have been identified as deficient in pole height and class compared to current standards. Poles are identified in accordance with Milton Hydro's asset management plan. To replace an asset at the end of its lifecycle is ideal in achieving asset lifecycle optimization.
Asset Condition Relative to Typical Life Cycle (5.4.5.2.C. b 1st bullet, 2nd dash)	The majority of poles identified for replacement are in a deteriorated condition as expected of a pole at the end of a typical life cycle
Number of Customers in Each Class Potentially Affected (5.4.5.2.C. b 1st bullet, 3rd dash)	The number of customers affected by a pole failure can range from zero to as many as 260. The majority of customers are rural residential customers that depend on electricity to heat their homes.
Quantitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 4th dash)	The duration of a customer interruption caused by a pole failure can range from a momentary interruption (less than 1 minute) to several hours depending on the work required to restore power. Typically however, outages caused by pole failures are of a longer duration. The risk of a customer interruption occurring as a result of a pole failure is high due to the nature of equipment supported by the pole.
Qualitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 5th dash)	Qualitative impact includes loss of customer confidence and company reputation due to a reduction in system reliability and perceived mismanagement of assets. The risk of the loss of customer confidence is high and growing as the ease to communicate via social media increases
Value of Customer Impact (5.4.5.2.C. b 1st bullet, 6th dash)	high

Other Factors Affecting Project Timing (5.4.5.2.C.b 2nd bullet)

Not applicable

Consequences for System O&M costs (5.4.5.2.C.b 3rd bullet)

Not applicable

Reliability and Safety Factors (5.4.5.2.b 4th bullet)

System reliability and safety are positively impacted by replacing end of life assets on a proactive basis

Analysis of Project Benefits and Timing (5.4.5.2.C.b 5th bullet)

Not applicable

Like for Like Renewal Analysis (5.4.5.2.C.b 6nd bullet)

Not applicable

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Sixth Line Nassagaweya North of 20 Sideroad, Overhead Asset Renewal**
Investment Category	System Renewal
Project Description	Spatial analysis of pole attribute data and subsequent field inspections have identified this section of poles with the majority of poles at or near their end of useful life. The majority of poles are 35' class 5, single circuit construction and do not meet current construction standards.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$321,400
Customer Contribution	$0
Net Capital	$321,400
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	16
Customer Load (peak kVA)	100 kVA

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	April 4, 2016
Expected In-Service Date	May 27, 2016
Expenditure Timing:	
Q1	$0
Q2	$321,400
Q3	$0
Q4	$0

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Design and construction schedules are reviewed on a regular basis to ensure all required pole replacements are completed

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	Not applicable
2012	Not applicable
2013	Not applicable
2014	Not applicable
2015	Not applicable

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	The main driver for this project is safety. Poles identified as at end-of-life may fail unexpectedy or be in an imminent position to fail and are replaced proactively, as required, in order to maintain the safety and integrity of the distribution system.
Related Objectives and/or Performance Targets	System reliability, improved system performance
Source and Nature of Information used to Justify Project	Annual pole testing and inspection program results
Secondary Driver (where applicable)	Not applicable
Related Objectives and Performance Targets	Not applicable
Source and Nature of Information used to Justify Project	Not applicable
Investment Priority (5.4.5.2.B.1.b)	Planned pole replacements are given a high priority. Failure of these assets poses a safety risk to Milton Hydro employees and the general public. Failure also negatively impacts service reliability to customers supplied by the pole line

Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	Not applicable
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Replaced assets are installed to current standards (eg. Standard framing resulting in improved working clearances)
Net benefits accruing to customers	Reduced safety risk to general public
Impact of Investment on Reliability Performance	Improved System Reliability due to reduced risk of asset failure

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	New assets are installed according to current safety standards in compliance with Ontario Regulation 22/04. Reduced safety risk to employees and general public.

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	Not applicable

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Not applicable
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Not applicable

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Not applicable

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Renewal

Relationship between the Characteristics of Targeted Assets and the Consequences of Asset Failure (5.4.5.2.C.b-1st bullet)

Asset Performance Targets and Asset Lifecycle Optimization Policies and Practices (5.4.5.2.C.b 1st bullet, 1st dash)	The majority of poles identified for replacement have decayed as expected and reached the typical end of life age for a pole. Those that haven't reached end of life age have been identified as deficient in pole height and class compared to current standards. Poles are identified in accordance with Milton Hydro's asset management plan. To replace an asset at the end of its lifecycle is ideal in achieving asset lifecycle optimization.
Asset Condition Relative to Typical Life Cycle (5.4.5.2.C. b 1st bullet, 2nd dash)	The majority of poles identified for replacement are in a deteriorated condition as expected of a pole at the end of a typical life cycle
Number of Customers in Each Class Potentially Affected (5.4.5.2.C. b 1st bullet, 3rd dash)	The number of customers affected by a pole failure can range from zero to as many as 260. The majority of customers are rural residential customers that depend on electricity to heat their homes.
Quantitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 4th dash)	The duration of a customer interruption caused by a pole failure can range from a momentary interruption (less than 1 minute) to several hours depending on the work required to restore power. Typically however, outages caused by pole failures are of a longer duration. The risk of a customer interruption occurring as a result of a pole failure is high due to the nature of equipment supported by the pole.
Qualitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 5th dash)	Qualitative impact includes loss of customer confidence and company reputation due to a reduction in system reliability and perceived mismanagement of assets. The risk of the loss of customer confidence is high and growing as the ease to communicate via social media increases
Value of Customer Impact (5.4.5.2.C. b 1st bullet, 6th dash)	high

Other Factors Affecting Project Timing (5.4.5.2.C.b 2nd bullet)

Not applicable

Consequences for System O&M costs (5.4.5.2.C.b 3rd bullet)

Not applicable

Reliability and Safety Factors (5.4.5.2.b 4th bullet)

System reliability and safety are positively impacted by replacing end of life assets on a proactive basis

Analysis of Project Benefits and Timing (5.4.5.2.C.b 5th bullet)

Not applicable

Like for Like Renewal Analysis (5.4.5.2.C.b 6nd bullet)

Not applicable

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Miscellaneous System Renewal, Under Threshold**
Investment Category	System Renewal
Project Description	Provision for urgent and necessary equipment replacement identified as a result of routine system inspections, severe weather events, foreign interference and customer service calls. Reactive renewal of assets with a "run to failure" replacement strategy are included in this category (eg. distribution transformers). Small discresionary projects below a materiality threshold of $85,000 are also included in this category.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$350,000
Customer Contribution	$0
Net Capital	$350,000
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	Not applicable
Customer Load (peak kVA)	Not applicable

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 1, 2016
Expected In-Service Date	December 31, 2016
Expenditure Timing:	
Q1	$87,500
Q2	$87,500
Q3	$87,500
Q4	$87,500

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Design and construction schedules are reviewed on a regular basis to ensure all required projects and equipment replacements are completed

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs

2011	$247,997
2012	
2013	
2014	
2015	$375,000

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	The main driver for this project is safety. Assets identified as failed or in an imminent position to fail are replaced reactively, as required, in order to maintain the safety and integrity of the distribution system.
Related Objectives and/or Performance Targets	Safety, Efficiency, Reliability, Customer Value
Source and Nature of Information used to Justify Project	Routine and reactive inspections have identified assets that require urgent replacement in order to maintain the safety and integrity of the distribution system.
Secondary Driver (where applicable)	Secondary drivers are drivers such as system reliability and operational efficiency. Assets identified as failed or in an imminent position to fail, such as switches, are replaced as required to maintain the reliability and operational efficiency of the distribution system.
Related Objectives and Performance Targets	Safety, Efficiency, Reliability, Customer Value
Source and Nature of Information used to Justify Project	Routine and reactive inspections have identified assets that require urgent replacement in order to maintain the reliability and operational efficiency of the distribution system.

Investment Priority (5.4.5.2.B.1.b)	Assets identified as failed or in an imminent position to fail are given a high priority. Failure of these assets poses a safety risk to Milton Hydro employees and the general public. Failure also negatively impacts service reliability to affected customers
Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	Not applicable
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Replaced assets are installed to current standards using standard material. Operation efficiency is improved due to reduced risk of asset failure during operation
Net benefits accruing to customers	Reduced safety risk to general public, improved service reliability and operational efficiency
Impact of Investment on Reliability Performance	Improved System Reliability due to reduced risk of asset failure

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	Replaced assets are installed according to current safety standards. Health and safety protections and performance levels are expected to be maintained or improved

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	Not applicable

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Not applicable
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Not applicable

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Not applicable

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Renewal

Relationship between the Characteristics of Targeted Assets and the Consequences of Asset Failure (5.4.5.2.C.b-1st bullet)

Asset Performance Targets and Asset Lifecycle Optimization Policies and Practices (5.4.5.2.C.b 1st bullet, 1st dash)	Not applicable
Asset Condition Relative to Typical Life Cycle (5.4.5.2.C. b 1st bullet, 2nd dash)	The majority of assets identified for replacement are at or past expected end-of-life. Some assets may be identified as failed due to vehicular impact or foreign interference such as severe weather. These assets may not have reached the expected end-of-life asset age.
Number of Customers in Each Class Potentially Affected (5.4.5.2.C. b 1st bullet, 3rd dash)	Varies – pole failure may involve an entire feeder depending on location and protective device activated (ie. lateral fuse or circuit breaker, etc.); other assets (ie. Pole transformer) may have limited local impact
Quantitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 4th dash)	If a customer power interruption occurs as a result of an asset failure, the duration can range from a momentary interruption (less than 1 minute) to several hours depending on the work required to restore power.
Qualitative Customer Impact and Risk (5.4.5.2.C. b 1st bullet, 5th dash)	Reduced outages will improve customer satisfaction
Value of Customer Impact (5.4.5.2.C. b 1st bullet, 6th dash)	High

Other Factors Affecting Project Timing (5.4.5.2.C.b 2nd bullet)

Milton Hydro has the resources and materials in order to ensure timely asset replacement and system restoration. Emergency locates required from others.

Consequences for System O&M costs (5.4.5.2.C.b 3rd bullet)

Not applicable

Reliability and Safety Factors (5.4.5.2.b 4th bullet)

System reliability and safety are positively impacted by replacing failed assets. Assets are installed according to current safety standards in compliance with Ontario Regulation 22/04.

Analysis of Project Benefits and Timing (5.4.5.2.C.b 5th bullet)

Not applicable

Like for Like Renewal Analysis (5.4.5.2.C.b 6nd bullet)

Not applicable

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**WiMAX – Automate Switches**
Investment Category	System Service
Project Description	This project includes the installation of communication equipment as required at approximately 25 existing switch locations to enable the remote control capability of the switches through the WiMAX system. The SCADA system will be used for remote operator monitoring and control of switches via the WiMAX system.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$120,000
Customer Contribution	$0
Net Capital	$120,000
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	Not applicable
Customer Load (peak kVA)	Not applicable

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 4, 2016
Expected In-Service Date	December 30, 2016
Expenditure Timing:	
Q1	$30,000
Q2	$30,000
Q3	$30,000
Q4	$30,000

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Material and resources are available. Design and construction schedules are reviewed on a regular basis to ensure project completion.

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	Not applicable
2012	Not applicable
2013	Not applicable
2014	Not applicable
2015	$120,000

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	The main driver is to improve system reliability and operations efficiencies. Remotely controlled switches reduce restoration times and reduce switching time to transfer loads in emergencies.
Related Objectives and/or Performance Targets	Efficiency, Reliability, Customer Service
Source and Nature of Information used to Justify Project	MHDI Smart Grid plan
Secondary Driver (where applicable)	A secondary driver is the ability to obtain real time data from the system. Switches reporting to SCADA provide current and voltage readings that were not previously available in the absence of an RTU at each switch location.
Related Objectives and Performance Targets	Efficiency, Reliability, Customer Service
Source and Nature of Information used to Justify Project	MHDI Smart Grid plan
Investment Priority (5.4.5.2.B.1.b)	High, MHDI Smart Grid plan

Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	The alternative is to continue to operate switches manually. However, this alternative will require staff to manually operate a significant number of switches to isolate faults or transfer loads between feeders. This will increase outage restoration time and have a negative impact on system reliability.
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Enhanced capability for Operators to switch and reconfigure the distribution system and improved outage restoration. Reduced crew dispatch, reliability improvements, reduced customer outage times and related costs.
Net benefits accruing to customers	Reduced customer outage times and related costs
Impact of Investment on Reliability Performance	Improved reliability

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	Improved ability to isolate defective plant/areas where health and safety risks exist (ie. downed wires)

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	WiMAX frequency is dedicated to utilities for smart grid applications. No interference issues such as in public licensed spectrums (ie. 900 MHz).

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Distribution automation (remotely controlled switch capability) is fundamental component of smart grid development. WiMAX frequency is standard for smart grid applications
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	The installation of RTUs on existing manual switches will enable their remote control capability. Switches will be remotely operated from MHDI’s control room. Switches will also have the technical capability to be included in potential future distribution system automation schemes (e.g. “self-healing” restoration)

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Reliability of electrical supply is crucial to commercial and industrial businesses. It is a key component of any municipal economic development strategy.

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Service

Relationship between the Characteristics of Targeted Assets and the Consequences of Asset Failure (5.4.5.2.C.c)

Assessment of the benefits of the project in relation to the achievement of the objectives of investment (5.4.5.2.C. c 1st bullet)	Reduced outage duration through SCADA control
Regional electricity infrastructure requirements affecting the initiation or final configuration of project (5.4.5.2.C. c 2nd bullet)	Not applicable
Advanced technology incorporated into project (5.4.5.2.C. c 3rd bullet)	WiMAX frequency is dedicated for LDC smart grid applications. Cybersecurity needs have been addressed by firewalls and relay configuration
Reliability, efficiency, safety and coordination benefits or effects on distribution system (5.4.5.2.C. c 4th bullet)	Improved system configuration capability; real-time operator information; improved outage response
Factors affecting implementation timing/priority (5.4.5.2.C. c 5th bullet)	Not applicable
Analysis of project benefits and costs comparing proposed project to (a) doing nothing; and (b) technically feasible alternatives (5.4.5.2.C. c 6th bullet)	The installation of remotely controlled system switches and their related SCADA telemetry return will reduce crew response time required to identify and locate the causes of power outages and will reduce customer restoration times due to the capability to operate more devices from the control room.

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**WiMAX – 100 meter points**
Investment Category	System Service
Project Description	This project includes the installation of communication equipment as required at approximately 100 existing meter data collector locations to replace existing analogue type communication equipment that will be obsolete as of 2016. The new communication equipment will enable Milton Hydro to utilize its in-house WiMAX infrastructure to collect metering information.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$650,000
Customer Contribution	$0
Net Capital	$650,000
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	Not applicable
Customer Load (peak kVA)	Not applicable

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 4, 2016
Expected In-Service Date	December 30, 2016
Expenditure Timing:	
Q1	$150,000
Q2	$200,000
Q3	$200,000
Q4	$50,000

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Material and resources are available. Design and construction schedules are reviewed on a regular basis to ensure project completion.

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	Not applicable
2012	Not applicable
2013	Not applicable
2014	Not applicable
2015	$650,000

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	The main driver is to improve system reliability and operations efficiencies. Grid monitoring sensors provide real time system information to the control room supporting decisions related to optimizing distribution system configuration.
Related Objectives and/or Performance Targets	Peak load management, improved outage restoration, reduced crew dispatch, reliability improvements, reduced customer outage times and related costs
Source and Nature of Information used to Justify Project	MHDI Smart Grid plan
Secondary Driver (where applicable)	Not applicable
Related Objectives and Performance Targets	Not applicable
Source and Nature of Information used to Justify Project	Not applicable
Investment Priority (5.4.5.2.B.1.b)	High, MHDI Smart Grid plan

Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	The alternative is to continue to operate the system without the benefit of real time system information from within the distribution system. As the system continues to grow, this will increase outage restoration times and have a negative impact on system reliability.
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Enhanced capability for operators to make decisions to reconfigure the distribution system and improved outage restoration. Reduced crew dispatch, reliability improvements, reduced customer outage times and related costs.
Net benefits accruing to customers	Reduced customer outage times and related costs
Impact of Investment on Reliability Performance	Improved reliability

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	Improved information to ascertain real time state of the distribution system.

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	WiMAX frequency is dedicated to utilities for smart grid applications. No interference issues such as in public licensed spectrums (ie. 900 MHz).

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Real time distribution system information is fundamental component of smart grid development. WiMAX frequency is standard for smart grid applications
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Real time distribution system information will be required for potential future distribution system automation schemes (eg. “self healing” restoration)

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Reliability of electrical supply is crucial to commercial and industrial businesses. It is a key component of any municipal economic development strategy.

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Service

Relationship between the Characteristics of Targeted Assets and the Consequences of Asset Failure (5.4.5.2.C.c)

Assessment of the benefits of the project in relation to the achievement of the objectives of investment (5.4.5.2.C. c 1st bullet)	Reduced outage duration through SCADA control
Regional electricity infrastructure requirements affecting the initiation or final configuration of project (5.4.5.2.C. c 2nd bullet)	Not applicable
Advanced technology incorporated into project (5.4.5.2.C. c 3rd bullet)	WiMAX frequency is dedicated for LDC smart grid applications. Cybersecurity needs have been addressed by firewalls and relay configuration
Reliability, efficiency, safety and coordination benefits or effects on distribution system (5.4.5.2.C. c 4th bullet)	Improved system configuration capability; real-time operator information; improved outage response
Factors affecting implementation timing/priority (5.4.5.2.C. c 5th bullet)	Not applicable
Analysis of project benefits and costs comparing proposed project to (a) doing nothing; and (b) technically feasible alternatives (5.4.5.2.C. c 6th bullet)	The information returned to SCADA by the grid monitoring sensors will reduce crew response time required to identify and locate the causes of power outages

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Install Fault Indicators with WiMAX**
Investment Category	System Service
Project Description	This program includes the installation of communication enabled fault indicators at various points along MHDI feeders. The fault indicators provide system operators with information to allow them to pinpoint and isolate faulted sections more rapidly, thereby restoring power to most customers and allowing crews to focus their efforts on the source of the outage.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$175,000
Customer Contribution	$0
Net Capital	$175,000
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	Not applicable
Customer Load (peak kVA)	Not applicable

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 4, 2016
Expected In-Service Date	December 30, 2016
Expenditure Timing:	
Q1	$43,750
Q2	$43,750
Q3	$43,750
Q4	$43,750

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Material and resources are available. Design and construction schedules are reviewed on a regular basis to ensure project completion.

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	Not applicable
2012	Not applicable
2013	Not applicable
2014	Not applicable
2015	$175,000

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	The main driver is to improve system reliability by reducing the time required to find a fault on the system. The information provided by the fault indicators to the control room will assist in directing crews to the source area of the system fault. Operators will also have the information needed to reconfigure the system to restore power to customers upstream of the faulted section.
Related Objectives and/or Performance Targets	Reduced customer outage times and related costs
Source and Nature of Information used to Justify Project	MHDI Smart Grid plan
Secondary Driver (where applicable)	As a secondary benefit, the fault indicators also act as grid monitoring sensors. Information regarding the condition of the distribution system (current, voltage) at the location of the fault indicator is available to the SCADA system on a continual basis.
Related Objectives and Performance Targets	Peak load management, improved outage restoration, reduced crew dispatch, reliability improvements
Source and Nature of Information used to Justify Project	MHDI Smart Grid plan

Investment Priority (5.4.5.2.B.1.b)	High, MHDI Smart Grid plan
Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	The alternative is to continue to operate the system without the benefit of instant fault indicator information. As the system continues to grow, this will increase outage restoration times and have a negative impact on system reliability.
Effect of Investment on System Operation Efficiency and Cost Effectiveness	Enhanced information available to Operators to make decisions to reconfigure the system and restore power to as many customers as possible and to dispatch crews to the area in need of repair. Reduced crew dispatch, reliability improvements, reduced customer outage times and related costs.
Net benefits accruing to customers	Reduced customer outage times and related costs
Impact of Investment on Reliability Performance	Improved reliability

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	Improved information to ascertain real time state of the distribution system.

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	WiMAX frequency is dedicated to utilities for smart grid applications. No interference issues such as in public licensed spectrums (ie. 900 MHz).

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Real time distribution system information is a fundamental component of smart grid development. WiMAX frequency is standard for smart grid applications
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Real time distribution system information will be required for potential future distribution system automation schemes (eg. “self healing” restoration)

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Reliability of electrical supply is crucial to commercial and industrial businesses. It is a key component of any municipal economic development strategy.

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Service

Relationship between the Characteristics of Targeted Assets and the Consequences of Asset Failure (5.4.5.2.C.c)

Assessment of the benefits of the project in relation to the achievement of the objectives of investment (5.4.5.2.C. c 1st bullet)	Reduced outage duration through SCADA control
Regional electricity infrastructure requirements affecting the initiation or final configuration of project (5.4.5.2.C. c 2nd bullet)	Not applicable
Advanced technology incorporated into project (5.4.5.2.C. c 3rd bullet)	WiMAX frequency is dedicated for LDC smart grid applications. Cybersecurity needs have been addressed by firewalls and relay configuration
Reliability, efficiency, safety and coordination benefits or effects on distribution system (5.4.5.2.C. c 4th bullet)	Improved system configuration capability; real-time operator information; improved outage response
Factors affecting implementation timing/priority (5.4.5.2.C. c 5th bullet)	Not applicable
Analysis of project benefits and costs comparing proposed project to (a) doing nothing; and (b) technically feasible alternatives (5.4.5.2.C. c 6th bullet)	The information returned to SCADA by the fault indicators will reduce crew response time required to identify and locate the causes of power outages

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Install Automated Switches with WiMAX**
Investment Category	System Service
Project Description	This is a multi-year planned program to install remotely controlled switches on the overhead distribution system, connected to the WiMAX communication network. These switches will be remotely monitored and controlled, contributing to improved power reliability as well as decreased outage restoration times.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$194,000
Customer Contribution	$0
Net Capital	$194,000
O&M Costs	$0

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	Not applicable
Customer Load (peak kVA)	Not applicable

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 4, 2016
Expected In-Service Date	December 30, 2016
Expenditure Timing:	
Q1	$48,500
Q2	$48,500
Q3	$48,500
Q4	$48,500

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Material and resources are available. Design and construction schedules are reviewed on a regular basis to ensure project completion.

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	Not applicable
2012	Not applicable
2013	Not applicable
2014	Not applicable
2015	Not applicable

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	The main driver is to improve system reliability and operations efficiencies. Remotely controlled switches reduce restoration times and reduce switching time to transfer loads in emergencies.
Related Objectives and/or Performance Targets	Efficiency, Reliability, Customer Service
Source and Nature of Information used to Justify Project	MHDI Smart Grid plan
Secondary Driver (where applicable)	A secondary driver is the ability to obtain real time data from the system. Switches reporting to SCADA provide current and voltage readings that were not previously available in the absence of an RTU at each switch location.
Related Objectives and Performance Targets	Efficiency, Reliability, Customer Service
Source and Nature of Information used to Justify Project	MHDI Smart Grid plan
Investment Priority (5.4.5.2.B.1.b)	High, MHDI Smart Grid plan
Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	The alternative is to continue to install switches that operate manually. However, this alternative will require staff to manually operate a significant number of switches to isolate faults or transfer loads between feeders. This will increase outage restoration time and have a negative impact on system reliability.

Effect of Investment on System Operation Efficiency and Cost Effectiveness	Enhanced capability for Operators to switch and reconfigure the distribution system and improved outage restoration. Reduced crew dispatch, reliability improvements, reduced customer outage times and related costs.
Net benefits accruing to customers	Reduced customer outage times and related costs
Impact of Investment on Reliability Performance	Improved reliability

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	Improved ability to isolate defective plant/areas where health and safety risks exist (ie. downed wires)

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	WiMAX frequency is dedicated to utilities for smart grid applications. No interference issues such as in public licensed spectrums (ie. 900 MHz).

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Distribution automation (remotely controlled switch capability) is fundamental component of smart grid development. WiMAX frequency is standard for smart grid applications
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	The installation of RTUs on existing manual switches will enable their remote control capability. Switches will be remotely operated from MHDI's control room. Switches will also have the technical capability to be included in potential future distribution system automation schemes (eg. "self healing" restoration)

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Reliability of electrical supply is crucial to commercial and industrial businesses. It is a key component of any municipal economic development strategy.

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not applicable

C. Category-Specific Requirements

System Service

Relationship between the Characteristics of Targeted Assets and the Consequences of Asset Failure (5.4.5.2.C.c)

Assessment of the benefits of the project in relation to the achievement of the objectives of investment (5.4.5.2.C. c 1st bullet)	Reduced outage duration through SCADA control
Regional electricity infrastructure requirements affecting the initiation or final configuration of project (5.4.5.2.C. c 2nd bullet)	Not applicable
Advanced technology incorporated into project (5.4.5.2.C. c 3rd bullet)	WiMAX frequency is dedicated for LDC smart grid applications. Cybersecurity needs have been addressed by firewalls and relay configuration
Reliability, efficiency, safety and coordination benefits or effects on distribution system (5.4.5.2.C. c 4th bullet)	Improved system configuration capability; real-time operator information; improved outage response
Factors affecting implementation timing/priority (5.4.5.2.C. c 5th bullet)	Not applicable
Analysis of project benefits and costs comparing proposed project to (a) doing nothing; and (b) technically feasible alternatives (5.4.5.2.C. c 6th bullet)	The installation of remotely controlled system switches and their related SCADA telemetry return will reduce crew response time required to identify and locate the causes of power outages and will reduce customer restoration times due to the capability to operate more devices from the control room.

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	**Vehicle Replacement Program**
Investment Category	General Plant
Project Description	The Milton Hydro Distribution Inc. fleet requires several new vehicles in 2016 which include one small transit van, one squirt boom truck and a 46' single bucket truck. These trucks are used for the construction and maintenance of overhead/underground plant, and for the emergency restoration of storm damaged services.

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	$ 510,000
Customer Contribution	N/A
Net Capital	$510,000
O&M Costs	N/A

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	
Customer Load (peak kVA)	

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	January 4, 2016
Expected In-Service Date	November 30, 2016
Expenditure Timing:	
Q1	$ 35,000
Q2	$ 325,000
Q3	
Q4	$ 150,000

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Milton Hydro monitors manufacturing schedules and delivery dates and provides feedback to manufacturer as needed

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs

2010	N/A
2011	$ 138,000
2012	$ 82,000
2013	$ 377,850
2014	$ 545,553

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Not Applicable

Leave to Construct Approval (5.4.5.2.A 7th bullet)

Not Applicable

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	Reliability
Related Objectives and/or Performance Targets	Improve SAIDI & SAIFI
Source and Nature of Information used to Justify Project	Historical maintenance and performance data for all vehicles.
Secondary Driver (where applicable)	Not Applicable
Related Objectives and Performance Targets	Not Applicable
Source and Nature of Information used to Justify Project	Not Applicable
Investment Priority (5.4.5.2.B.1.b)	Mid-High
Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	The alternative considered was to refurbish truck #39, but this was not economically feasible after factoring in the costs and down-time of the vehicle. Milton Hydro also considered the option of further outsourcing the increased work demand due to the high growth; however, to have a vehicle which will support the ability to quickly respond to outages and emergency events such as the ice storm of 2013 was a high determining factor in making this decision.

Effect of Investment on System Operation Efficiency and Cost Effectiveness	Milton Hydro's will have an improved ability to respond to outages and emergencies, and will reduce the duration of Customer power outages, and operating costs.
Net benefits accruing to customers	The Squirt Boom Truck will be a new addition to the Milton Hydro fleet. One of the projects under way at Milton Hydro is the WiMAX/WiFi project. This project will create a private WiMAX communication network within the Milton Hydro grid. The Squirt Boom Truck will be a vehicle that will be operated by out MAC department and will be used to install and maintain this new WiMAX/WiFI system. As for the new 46' single bucket, customers will benefit from Milton Hydro's improved ability to respond to outages and emergencies, and will reduce the duration of Customer power outages, and operating costs. Also, it will enable new construction and maintenance to be completed on time, which will minimize the impact to the customer.
Impact of Investment on Reliability Performance	The 46' Single Bucket truck will be replacing truck #39 in the Milton Hydro fleet. Truck #39 will be 12 years old and requires significant repairs. The new 46' single bucket will provide improved reliability, lower operating and repair cost resulting in fewer breakdowns that will reduce Customer response times during outages and emergency calls. This vehicle will provide the versatility required for a growing utility, in supporting new construction as well as acting as a trouble truck for responding to emergencies.

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	Not Applicable

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	Not Applicable

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry (5.4.5.2.B.4.a)	Not Applicable
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements (5.4.5.2.B.4.b)	Not Applicable

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	Not Applicable

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	Not Applicable

C. Category-Specific Requirements

General Plant

Quantitative and Qualitative Analysis Results

(5.4.5.2.C.d 1st bullet)

Quantitative Analysis of Activity	Asset condition and life cycle cost of existing vehicle were analyzed and a formal tendering process is utilized for all new purchases
Qualitative Analysis of Activity	Not Applicable
Options to the Proposed Project	Not Applicable

Business Case for exceeding Materiality Threshold
(5.4.5.2.C.d 2nd bullet)

Justifications for Expenditure	The Milton Hydro Distribution Inc. fleet requires several new vehicles in 2016 which include one small transit van, one squirt boom truck and a 46' single bucket truck. These trucks are used for the construction and maintenance of overhead/underground plant, and for the emergency restoration of storm damaged services.
Alternatives Considered	The alternative considered was to refurbish truck #39, but this was not economically feasible after factoring in the costs and down-time of the vehicle. Milton Hydro also considered the option of further outsourcing the increased work demand due to the high growth; however, to have a vehicle which will support the ability to quickly respond to outages and emergency events such as the ice storm of 2013 was a high determining factor in making this decision.
Benefits for Customers	
Short Term:	
Long Term:	The Squirt Boom Truck will be a new addition to the Milton Hydro fleet. One of the projects under way at Milton Hydro is the WiMAX/WiFi project. This project will create a private WiFi communication network within the Milton Hydro grid. The Squirt Boom Truck will be a vehicle that will be operated by out MAC department and will be used to install and maintain this new WiMAX/WiFI system. As for the new 46' single bucket, customers will benefit from Milton Hydro's improved ability to respond to outages and emergencies, and will reduce the duration of Customer power outages, and operating costs. Also, it will enable new construction and maintenance to be completed on time, which will minimize the impact to the customer.
Impact on Distributor Costs	
Short Term:	Negligible impact
Long Term:	Negligible impact

Appendix A – Document Links

Halton Region Official Plan, March 2015

http://www.halton.ca/cms/One.aspx?portalId=8310&pageId=115808#accessrop

Places to Grow Act, 2005

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_05p13_e.htm

Halton Region Economic Review

http://webaps.halton.ca/forms/mailchimp/annual-economic-review.cfm

Northwest GTA sub-region Integrated Regional Resource Plan (IRRP), April 28, 2015

http://www.ieso.ca/Pages/Ontario's-Power-System/Regional-Planning/GTA-West/default.aspx

Kitchener-Waterloo-Cambridge-Guelph Region Integrated Regional Resource Plan (IRRP), April 28, 2015

http://www.ieso.ca/Pages/Ontario's-Power-System/Regional-Planning/Kitchener-Waterloo-Cambridge-Guelph/default.aspx

Town of Milton Strategic Plan – Destiny Milton 2, 2006

https://www.milton.ca/en/townhall/resources/dm2_adopted.pdf

Transit Master Plan, 2013 – 2017

http://www.milton.ca/meetingdocuments/council/agendas2013/rpts2013/eng-008-13%202013-2017%20milton%20transit%20master%20plan%20final.pdf

Intensification Study, 2010

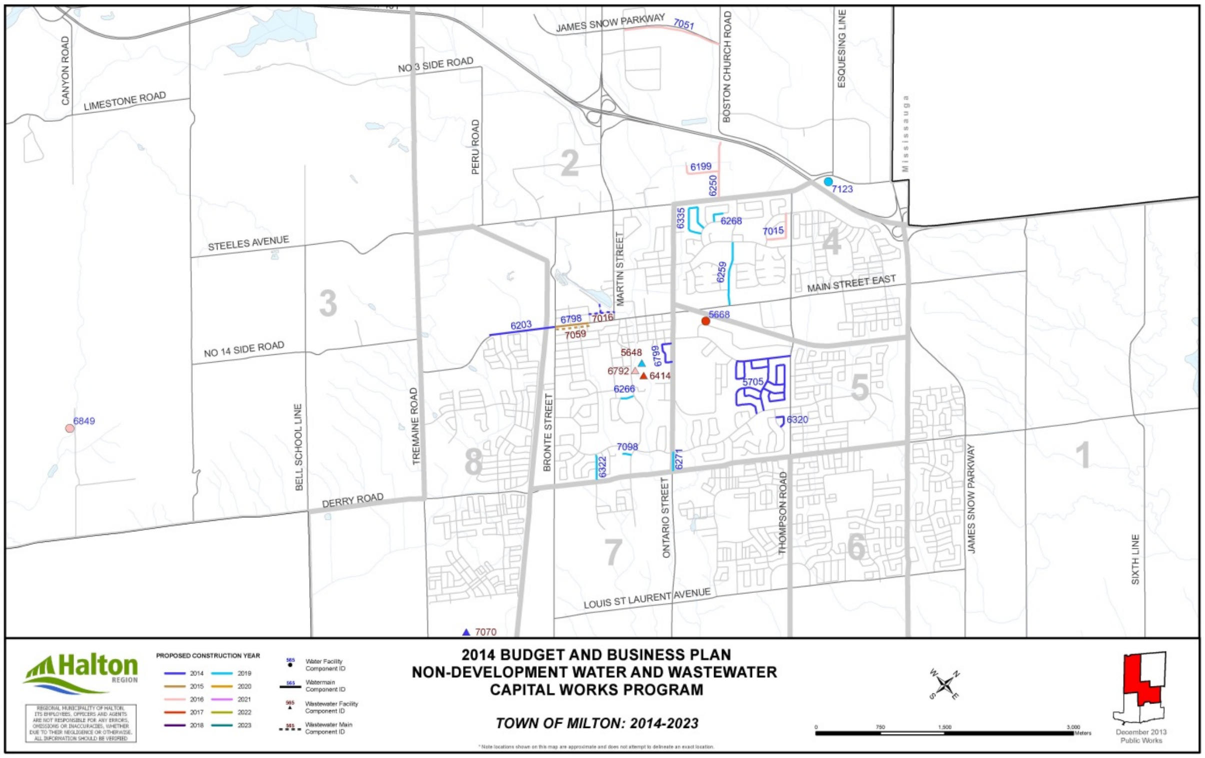
https://www.milton.ca/en/build/intensification.asp

Best Planning Estimates of Population, Occupied Dwelling Units and Employment, 2011-2031

http://www.halton.ca/planning_sustainability/plans_strategies_studies/haltons_regional_official_plan/regional_official_plan_amendments__ropas_/regional_development_phasing_to_2031/

Appendix B – Road Works

Town of Milton Road Works



TOWN OF MILTON
CAPITAL PROJECTS
10 Year Capital Forecast

Rural Roads Redevelopment

Run Date: 9/17/14 9:00 AM

	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Post Projection
C35000315 Lower Base Line (5th Ln to 4th Ln)													
2030 Funding													
8410 Contribution from Revenue			($44,730)									($44,730)	
8583 Federal Gas Tax Reserve Fund				($2,322,270)								($2,322,270)	
8601 Roads Res DC Fund			($2,982)	($154,818)								($157,800)	
8602 Roads Non-Res DC Fund			($1,988)	($103,212)								($105,200)	
Total 2030 Funding			($49,700)	($2,580,300)								($2,630,000)	
Total C35000315 Lower Base Line (5th Ln to 4th Ln)			($49,700)	($2,580,300)								($2,630,000)	
C35000515 Appleby Line													
2030 Funding													
8410 Contribution from Revenue			($450,212)									($450,212)	
8601 Roads Res DC Fund			($30,014)									($30,014)	
8602 Roads Non-Res DC Fund			($20,009)									($20,009)	
Total 2030 Funding			($500,235)									($500,235)	
Total C35000515 Appleby Line			($500,235)									($500,235)	
C35000715 1st Line - Nassagaweya													
2030 Funding													
8410 Contribution from Revenue					($206,550)			($1,907,715)				($2,114,265)	
8510 Aggregate Permit Fees Reserve							($300,000)	($300,000)				($600,000)	
8583 Federal Gas Tax Reserve Fund							($3,386,714)	($1,479,000)				($4,865,714)	
8601 Roads Res DC Fund					($13,770)		($245,781)	($245,781)				($505,332)	
8602 Roads Non-Res DC Fund					($9,180)		($163,854)	($163,854)				($336,888)	
Total 2030 Funding					($229,500)		($4,096,349)	($4,096,350)				($8,422,199)	
Total C35000715 1st Line - Nassagaweya					($229,500)		($4,096,349)	($4,096,350)				($8,422,199)	
C35000815 Surface Treatment Program													
2030 Funding													
8410 Contribution from Revenue	($157)		($847,901)	($847,901)	($847,901)	($847,901)	($847,901)	($847,901)	($847,901)	($847,901)		($6,783,365)	
8517 Capital Works-GTA Pooling	($1,091,177)											($1,091,177)	
Total 2030 Funding	($1,091,334)		($847,901)	($847,901)	($847,901)	($847,901)	($847,901)	($847,901)	($847,901)	($847,901)		($7,874,542)	
Total C35000815 Surface Treatment Program	($1,091,334)		($847,901)	($847,901)	($847,901)	($847,901)	($847,901)	($847,901)	($847,901)	($847,901)		($7,874,542)	
C35001115 Steeles Ave (Guelph Line-Millburough Line)													
2030 Funding													
8410 Contribution from Revenue													(3,662,700)
Total 2030 Funding													(3,662,700)
Total C35001115 Steeles Ave (Guelph Line-Millburough													(3,662,700)
C35001215 1st Line Nassagaweya - Wellington County To													
2030 Funding													
8555 Slot Reserve Fund	($529,164)											($529,164)	
Total 2030 Funding	($529,164)											($529,164)	

Rural Roads Redevelopment

TOWN OF MILTON
CAPITAL PROJECTS
10 Year Capital Forecast

Run Date: 9/17/14 9:00 AM

	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Post Projection
Total C35001215 1st Line Nassagaweya - Wellington Co	($529,164)											($529,164)	
C35012615 Campbell Ave East of Guelph Line													
2030 Funding													
8583 Federal Gas Tax Reserve Fund	($226,895)		($1,657,453)									($1,884,348)	
8601 Roads Res DC Fund	($15,126)		($110,497)									($125,623)	
8602 Roads Non-Res DC Fund	($10,084)		($73,664)									($83,748)	
Total 2030 Funding	($252,105)		($1,841,614)									($2,093,719)	
Total C35012615 Campbell Ave East of Guelph Line	($252,105)		($1,841,614)									($2,093,719)	
C35012715 6th Line Nassagaweya (25 SR -32 SR)													
2030 Funding													
8360 Developer Recovery	($58,500)											($58,500)	
8410 Contribution from Revenue			($1,493,027)									($1,493,027)	
8555 Slot Reserve Fund	($58,831)											($58,831)	
Total 2030 Funding	($117,331)		($1,493,027)									($1,610,358)	
Total C35012715 6th Line Nassagaweya (25 SR -32 SR)	($117,331)		($1,493,027)									($1,610,358)	
C35012815 Expanded Asphalt Program													
2030 Funding													
8410 Contribution from Revenue	($1,177,799)		($2,318,611)	($2,605,796)	($2,685,157)	($2,724,326)	($2,769,346)	($2,812,331)	($2,852,264)	($2,901,354)	($2,940,769)	($25,787,753)	
Total 2030 Funding	($1,177,799)		($2,318,611)	($2,605,796)	($2,685,157)	($2,724,326)	($2,769,346)	($2,812,331)	($2,852,264)	($2,901,354)	($2,940,769)	($25,787,753)	
Total C35012815 Expanded Asphalt Program	($1,177,799)		($2,318,611)	($2,605,796)	($2,685,157)	($2,724,326)	($2,769,346)	($2,812,331)	($2,852,264)	($2,901,354)	($2,940,769)	($25,787,753)	
C35012915 Eighth Line - Bank Stabilization Project													
2030 Funding													
8410 Contribution from Revenue	($221,815)											($221,815)	
Total 2030 Funding	($221,815)											($221,815)	
Total C35012915 Eighth Line - Bank Stabilization Projec	($221,815)											($221,815)	
TOTAL CAPITAL PROJECTS	($3,389,548)		($7,051,088)	($6,033,997)	($3,762,558)	($3,572,227)	($7,713,596)	($7,796,582)	($3,700,165)	($3,749,255)	($2,940,769)	($49,669,785)	(3,662,700)

TOWN OF MILTON
CAPITAL PROJECTS
10 Year Capital Forecast

Rural Roads Growth

Run Date: 9/17/14 9:01 AM

	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Post Projection
C36010515 Fifth Line - (15 Sr Southerly)													
2030 Funding													
8410 Contribution from Revenue													(260,000)
Total 2030 Funding													(260,000)
Total C36010515 Fifth Line - (15 Sr Southerly)													(260,000)
C36010715 Fifth Line													
2030 Funding													
8410 Contribution from Revenue													(247,490)
8601 Roads Res DC Fund													(1,336,446)
8602 Roads Non-Res DC Fund													(890,964)
Total 2030 Funding													(2,474,900)
Total C36010715 Fifth Line													(2,474,900)
TOTAL CAPITAL PROJECTS													(2,734,900)

TOWN OF MILTON
CAPITAL PROJECTS
10 Year Capital Forecast

Urban Roads Growth

Run Date: 9/17/14 8:59 AM

	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Post Projection
C33010815 Bronte Street (Main St to Steeles Ave)													
2030 Funding													
8410 Contribution from Revenue			($990,328)									($990,328)	
8601 Roads Res DC Fund			($3,268,417)									($3,268,417)	
8602 Roads Non-Res DC Fund			($2,178,945)									($2,178,945)	
Total 2030 Funding			($6,437,690)									($6,437,690)	
Total C33010815 Bronte Street (Main St to Steeles Ave)			($6,437,690)									($6,437,690)	
C34000215 Bronte St (Britannia to Louis St Laurent)													
2030 Funding													
8410 Contribution from Revenue	($40,658)											($40,658)	
8583 Federal Gas Tax Reserve Fund			($823,642)									($823,642)	
8601 Roads Res DC Fund	($219,552)		($4,447,667)									($4,667,219)	
8602 Roads Non-Res DC Fund	($146,368)		($2,965,111)									($3,111,479)	
Total 2030 Funding	($406,578)		($8,236,420)									($8,642,998)	
Total C34000215 Bronte St (Britannia to Louis St Laure	($406,578)		($8,236,420)									($8,642,998)	
C34002015 Thompson Road (Louis St Laurent to Derry Rd													
2030 Funding													
8410 Contribution from Revenue													(627,187)
8601 Roads Res DC Fund													(3,386,810)
8602 Roads Non-Res DC Fund													(2,257,873)
Total 2030 Funding													(6,271,870)
Total C34002015 Thompson Road (Louis St Laurent to I													(6,271,870)
C34002115 Thompson Road (Britannia Rd to Louis St Lau													
2030 Funding													
8410 Contribution from Revenue					($571,076)							($571,076)	
8510 Aggregate Permit Fees Reserve				($97,600)	($282,314)							($379,914)	
8601 Roads Res DC Fund				($527,040)	($4,608,307)							($5,135,347)	
8602 Roads Non-Res DC Fund				($351,360)	($3,072,205)							($3,423,565)	
Total 2030 Funding				($976,000)	($8,533,902)							($9,509,902)	
Total C34002115 Thompson Road (Britannia Rd to Loui				($976,000)	($8,533,902)							($9,509,902)	
C34002215 Thompson Road (Derry Road to Main Street)													
2030 Funding													
8410 Contribution from Revenue													(69,870)
8601 Roads Res DC Fund													(382,201)
8602 Roads Non-Res DC Fund													(254,801)
Total 2030 Funding													(706,872)
Total C34002215 Thompson Road (Derry Road to Main S													(706,872)
C34002315 Thompson Road (CP Crossing)													
2030 Funding													

TOWN OF MILTON
CAPITAL PROJECTS
10 Year Capital Forecast

Urban Roads Growth

Run Date: 9/17/14 8:59 AM

	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Post Projection
8410 Contribution from Revenue													(841,821)
8601 Roads Res DC Fund													(4,604,878)
8602 Roads Non-Res DC Fund													(3,069,919)
Total 2030 Funding													(8,516,618)
Total C34002315 Thompson Road (CP Crossing)													(8,516,618)
C34003215 Louis St Laurent (Bronte St to RR25)													
2030 Funding													
8601 Roads Res DC Fund													(266,579)
8602 Roads Non-Res DC Fund													(177,719)
Total 2030 Funding													(444,298)
Total C34003215 Louis St Laurent (Bronte St to RR25)													(444,298)
C34003315 Louis St Laurent (Yates Dr to Thompson Rd)													
2030 Funding													
8601 Roads Res DC Fund				($199,004)	($2,621,656)							($2,820,660)	(220,791)
8602 Roads Non-Res DC Fund				($132,669)	($1,747,771)							($1,880,440)	(147,194)
Total 2030 Funding				($331,673)	($4,369,427)							($4,701,100)	(367,985)
Total C34003315 Louis St Laurent (Yates Dr to Thomps				($331,673)	($4,369,427)							($4,701,100)	(367,985)
C34003615 Louis St Laurent (Thompson Rd to 4th Line)													
2030 Funding													
8601 Roads Res DC Fund						($1,111,553)	($4,522,807)					($5,634,360)	(3,545,212)
8602 Roads Non-Res DC Fund						($741,035)	($3,015,204)					($3,756,239)	(2,363,474)
Total 2030 Funding						($1,852,588)	($7,538,011)					($9,390,599)	(5,908,686)
Total C34003615 Louis St Laurent (Thompson Rd to 4th						($1,852,588)	($7,538,011)					($9,390,599)	(5,908,686)
C34003715 Louis St Laurent (4th Line to James Snow Par													
2030 Funding													
8601 Roads Res DC Fund						($158,100)	($2,548,080)					($2,706,180)	(2,930,347)
8602 Roads Non-Res DC Fund						($105,400)	($1,698,720)					($1,804,120)	(1,953,564)
Total 2030 Funding						($263,500)	($4,246,800)					($4,510,300)	(4,883,911)
Total C34003715 Louis St Laurent (4th Line to James Sn						($263,500)	($4,246,800)					($4,510,300)	(4,883,911)
C34003815 Louis St Laurent (James Snow Pkwy to 5th Lir													
2030 Funding													
8410 Contribution from Revenue													(3,950,100)
8601 Roads Res DC Fund				($186,000)	($1,607,880)							($1,793,880)	
8602 Roads Non-Res DC Fund				($124,000)	($1,071,920)							($1,195,920)	
Total 2030 Funding				($310,000)	($2,679,800)							($2,989,800)	(3,950,100)
Total C34003815 Louis St Laurent (James Snow Pkwy t				($310,000)	($2,679,800)							($2,989,800)	(3,950,100)
C34003915 Louis St Laurent (RR25 to Yates Drive)													
2030 Funding													
8601 Roads Res DC Fund			($214,260)	($3,823,680)								($4,037,940)	

TOWN OF MILTON
CAPITAL PROJECTS
10 Year Capital Forecast

Urban Roads Growth

Run Date: 9/17/14 8:59 AM

	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Post Projection
8602 Roads Non-Res DC Fund			($142,840)	($2,549,120)								($2,691,960)	
Total 2030 Funding			($357,100)	($6,372,800)								($6,729,900)	
Total C34003915 Louis St Laurent (RR25 to Yates Drive)			($357,100)	($6,372,800)								($6,729,900)	
C34004015 5th Line (Hwy 401 to Main Street)													
2030 Funding													
8410 Contribution from Revenue			($99,308)									($99,308)	(3,400,100)
8601 Roads Res DC Fund			($536,263)									($536,263)	
8602 Roads Non-Res DC Fund			($357,509)									($357,509)	
Total 2030 Funding			($993,080)									($993,080)	(3,400,100)
Total C34004015 5th Line (Hwy 401 to Main Street)			($993,080)									($993,080)	(3,400,100)
C34004315 5th Line (Derry Road to Louis St Laurent)													
2030 Funding													
8410 Contribution from Revenue				($183,280)	($183,280)							($366,560)	(7,260,200)
8601 Roads Res DC Fund				($989,711)	($989,711)							($1,979,422)	
8602 Roads Non-Res DC Fund				($659,807)	($659,807)							($1,319,614)	
Total 2030 Funding				($1,832,798)	($1,832,798)							($3,665,596)	(7,260,200)
Total C34004315 5th Line (Derry Road to Louis St Laure				($1,832,798)	($1,832,798)							($3,665,596)	(7,260,200)
C34004415 5th Line (Louis St Laurent to Britannia Road)													
2030 Funding													
8410 Contribution from Revenue				($303,014)	($303,014)							($606,028)	(7,689,900)
8601 Roads Res DC Fund				($1,636,281)	($1,636,281)							($3,272,562)	
8602 Roads Non-Res DC Fund				($1,090,854)	($1,090,854)							($2,181,708)	
Total 2030 Funding				($3,030,149)	($3,030,149)							($6,060,298)	(7,689,900)
Total C34004415 5th Line (Louis St Laurent to Britannia				($3,030,149)	($3,030,149)							($6,060,298)	(7,689,900)
C34004515 5th Line (Britannia Road to Lower Base Line)													
2030 Funding													
8410 Contribution from Revenue													(19,839,800)
Total 2030 Funding													(19,839,800)
Total C34004515 5th Line (Britannia Road to Lower Bas													(19,839,800)
C34005015 Main Street (James Snow Pkwy to 5th Line)													
2030 Funding													
8410 Contribution from Revenue				($704,030)								($704,030)	
8601 Roads Res DC Fund				($3,801,762)								($3,801,762)	
8602 Roads Non-Res DC Fund				($2,534,508)								($2,534,508)	
Total 2030 Funding				($7,040,300)								($7,040,300)	
Total C34005015 Main Street (James Snow Pkwy to 5th				($7,040,300)								($7,040,300)	
C34005115 Main Street (5th Line to 258m E of 5th Line)													
2030 Funding													
8410 Contribution from Revenue							($10,200)					($10,200)	(1,210,000)

TOWN OF MILTON
CAPITAL PROJECTS
10 Year Capital Forecast

Urban Roads Growth

Run Date: 9/17/14 8:59 AM

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Post Projection
8583 Federal Gas Tax Reserve Fund							($87,790)				($87,790)	
8601 Roads Res DC Fund						($55,080)	($474,065)				($529,145)	
8602 Roads Non-Res DC Fund						($36,720)	($316,044)				($352,764)	
Total 2030 Funding						($102,000)	($877,899)				($979,899)	(1,210,000)
Total C34005115 Main Street (5th Line to 258m E of 5th						($102,000)	($877,899)				($979,899)	(1,210,000)
C34005215 Main Street (258m E of 5th Line to 6th Line)												
2030 Funding												
8410 Contribution from Revenue												(6,110,500)
8583 Federal Gas Tax Reserve Fund							($388,300)	($694,660)			($1,082,960)	
8601 Roads Res DC Fund							($2,096,820)	($3,751,164)			($5,847,984)	
8602 Roads Non-Res DC Fund							($1,397,880)	($2,500,776)			($3,898,656)	
Total 2030 Funding							($3,883,000)	($6,946,600)			($10,829,600)	(6,110,500)
Total C34005215 Main Street (258m E of 5th Line to 6th							($3,883,000)	($6,946,600)			($10,829,600)	(6,110,500)
C34005315 Main Street (6th Line to Trafalgar)												
2030 Funding												
8410 Contribution from Revenue												(6,809,400)
8601 Roads Res DC Fund								($1,854,000)			($1,854,000)	
8602 Roads Non-Res DC Fund								($1,236,000)			($1,236,000)	
Total 2030 Funding								($3,090,000)			($3,090,000)	(6,809,400)
Total C34005315 Main Street (6th Line to Trafalgar)								($3,090,000)			($3,090,000)	(6,809,400)
C34006015 6th Line (Hwy 401 to Derry Road)												
2030 Funding												
8410 Contribution from Revenue				($146,100)	($619,900)						($766,000)	
8583 Federal Gas Tax Reserve Fund					($655,000)						($655,000)	
8601 Roads Res DC Fund				($788,940)	($6,884,460)						($7,673,400)	
8602 Roads Non-Res DC Fund				($525,960)	($4,589,640)						($5,115,600)	
Total 2030 Funding				($1,461,000)	($12,749,000)						($14,210,000)	
Total C34006015 6th Line (Hwy 401 to Derry Road)				($1,461,000)	($12,749,000)						($14,210,000)	
C34006115 6th Line (Derry Road to Britannia Rd)												
2030 Funding												
8410 Contribution from Revenue				($84,400)	($100,000)						($184,400)	
8583 Federal Gas Tax Reserve Fund					($412,510)						($412,510)	
8601 Roads Res DC Fund				($455,760)	($2,767,554)						($3,223,314)	
8602 Roads Non-Res DC Fund				($303,840)	($1,845,036)						($2,148,876)	
Total 2030 Funding				($844,000)	($5,125,100)						($5,969,100)	
Total C34006115 6th Line (Derry Road to Britannia Rd)				($844,000)	($5,125,100)						($5,969,100)	
C34006215 6th Line (Derry Rd to 1928m S of Derry Rd)												
2030 Funding												
8410 Contribution from Revenue												(9,730,600)

TOWN OF MILTON
CAPITAL PROJECTS
10 Year Capital Forecast

Urban Roads Growth

Run Date: 9/17/14 8:59 AM

	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Post Projection
Total 2030 Funding													(9,730,600)
Total C34006215 6th Line (Derry Rd to 1928m S of Derr													(9,730,600)
C34006315 6th Line (1928m S of Derry Rd to Britannia Rd													
2030 Funding													
8410 Contribution from Revenue													(4,300,000)
Total 2030 Funding													(4,300,000)
Total C34006315 6th Line (1928m S of Derry Rd to Brita													(4,300,000)
C34006415 6th Line (Britannia Rd to Lower Base Line)													
2030 Funding													
8410 Contribution from Revenue													(8,471,180)
Total 2030 Funding													(8,471,180)
Total C34006415 6th Line (Britannia Rd to Lower Base													(8,471,180)
C34007015 Louis St. Laurent Extension (5th Line to 6th Li													
2030 Funding													
8410 Contribution from Revenue													(13,400,100)
8601 Roads Res DC Fund									($966,000)			($966,000)	
8602 Roads Non-Res DC Fund									($644,000)			($644,000)	
Total 2030 Funding									($1,610,000)			($1,610,000)	(13,400,100)
Total C34007015 Louis St. Laurent Extension (5th Line									($1,610,000)			($1,610,000)	(13,400,100)
C34007115 Louis St. Laurent Extension (6th Line to Trafal													
2030 Funding													
8410 Contribution from Revenue													(13,631,000)
8601 Roads Res DC Fund									($1,854,000)			($1,854,000)	
8602 Roads Non-Res DC Fund									($1,236,000)			($1,236,000)	
Total 2030 Funding									($3,090,000)			($3,090,000)	(13,631,000)
Total C34007115 Louis St. Laurent Extension (6th Line									($3,090,000)			($3,090,000)	(13,631,000)
C34008015 Green Connectors (Coll Rd 2 to Coll Rd 3 & RF													
2030 Funding													
8410 Contribution from Revenue													(4,480,120)
Total 2030 Funding													(4,480,120)
Total C34008015 Green Connectors (Coll Rd 2 to Coll R													(4,480,120)
TOTAL CAPITAL PROJECTS	($406,578)		($16,024,290)	($19,893,720)	($22,751,076)	($19,990,188)	($11,886,811)	($4,760,889)	($14,736,600)			($110,450,162)	(137,383,240)

TOWN OF MILTON
CAPITAL PROJECTS
10 Year Capital Forecast

Urban Roads Redevelopment

Run Date: 9/17/14 8:51 AM

	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Post Projection
C33010215 Main Street (Bronte to James)													
2030 Funding													
8410 Contribution from Revenue						($1,013,561)						($1,013,561)	
8601 Roads Res DC Fund						($912,204)						($912,204)	
8602 Roads Non-Res DC Fund						($608,136)						($608,136)	
Total 2030 Funding						($2,533,901)						($2,533,901)	
Total C33010215 Main Street (Bronte to James)						($2,533,901)						($2,533,901)	
C33012215 Ashbrook, Oak & Bruce													
2030 Funding													
8410 Contribution from Revenue	($77,291)		($1,692,041)									($1,769,332)	
Total 2030 Funding	($77,291)		($1,692,041)									($1,769,332)	
Total C33012215 Ashbrook, Oak & Bruce	($77,291)		($1,692,041)									($1,769,332)	
C33012515 Campbell Ave East Of Guelph Line													
2030 Funding													
8410 Contribution from Revenue	($322,548)		($839,438)									($1,161,986)	
Total 2030 Funding	($322,548)		($839,438)									($1,161,986)	
Total C33012515 Campbell Ave East Of Guelph Line	($322,548)		($839,438)									($1,161,986)	
C33013315 Wakefield Rd.													
2030 Funding													
8410 Contribution from Revenue	($1,043,054)											($1,043,054)	
Total 2030 Funding	($1,043,054)											($1,043,054)	
Total C33013315 Wakefield Rd.	($1,043,054)											($1,043,054)	
C33013515 Garden Lane													
2030 Funding													
8410 Contribution from Revenue	($95,434)		($940,698)									($1,036,132)	
Total 2030 Funding	($95,434)		($940,698)									($1,036,132)	
Total C33013515 Garden Lane	($95,434)		($940,698)									($1,036,132)	
C33013615 Crack Sealing Program													
2030 Funding													
8410 Contribution from Revenue	($100,000)		($100,000)	($100,000)	($16,028)	($16,028)	($16,028)	($16,028)	($16,028)	($16,028)	($16,028)	($412,196)	
8517 Capital Works-GTA Pooling	($67,950)		($67,950)	($67,950)	($67,950)	($67,950)	($67,950)	($67,950)	($67,950)	($67,950)	($67,950)	($679,500)	
Total 2030 Funding	($167,950)		($167,950)	($167,950)	($83,978)	($83,978)	($83,978)	($83,978)	($83,978)	($83,978)	($83,978)	($1,091,696)	
Total C33013615 Crack Sealing Program	($167,950)		($167,950)	($167,950)	($83,978)	($83,978)	($83,978)	($83,978)	($83,978)	($83,978)	($83,978)	($1,091,696)	
C33013715 Wheelabrator Way - Including Culvert Replace													
2030 Funding													
8220 Provincial Grants/Subsidies	($70,317)		($1,172,525)									($1,242,842)	
8506 Capital Works Reserve	($7,813)		($130,281)									($138,094)	
Total 2030 Funding	($78,130)		($1,302,806)									($1,380,936)	
Total C33013715 Wheelabrator Way - Including Culvert	($78,130)		($1,302,806)									($1,380,936)	

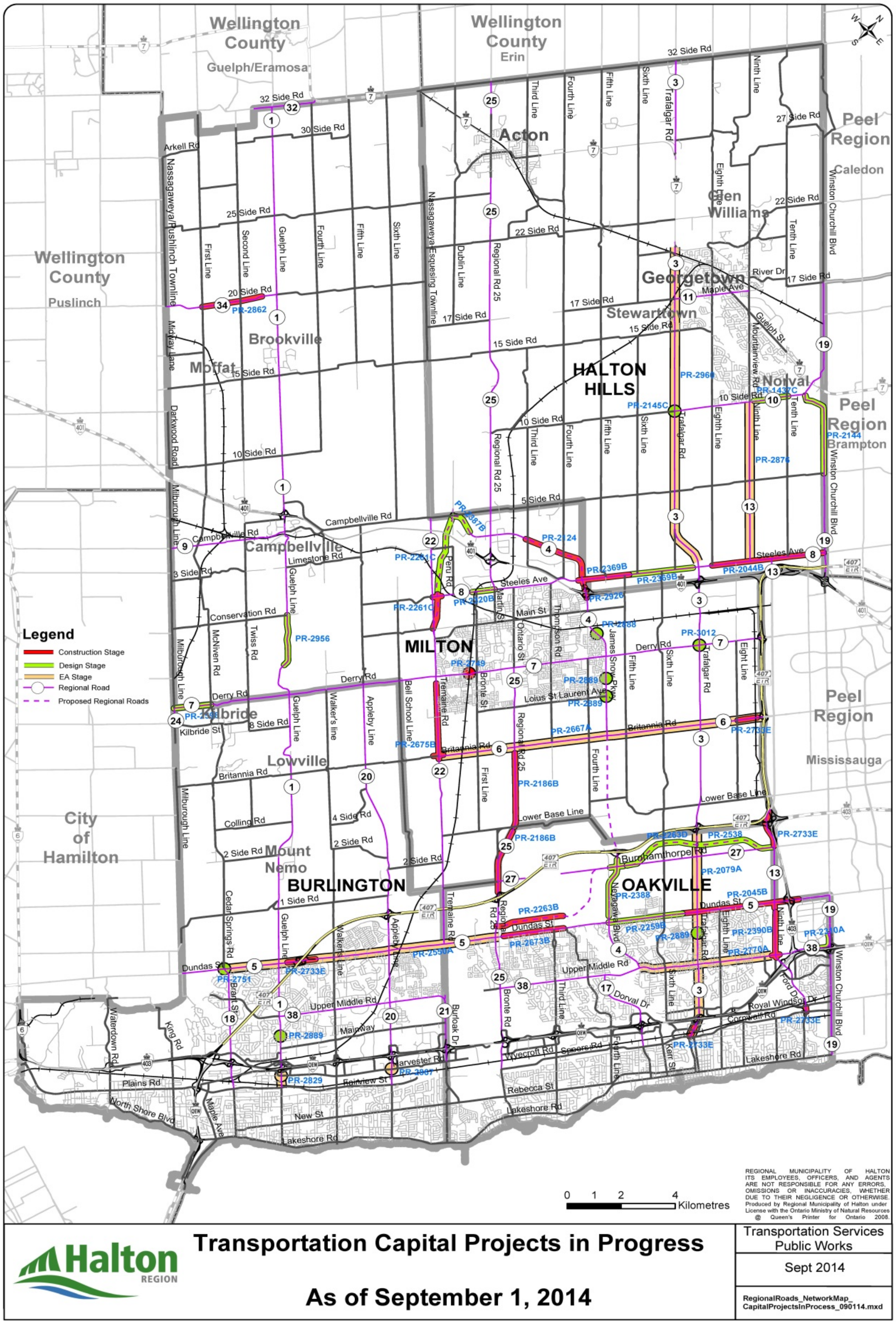
TOWN OF MILTON
CAPITAL PROJECTS
10 Year Capital Forecast

Urban Roads Redevelopment

Run Date: 9/17/14 8:51 AM

	2015		2016	2017	2018	2019	2020	2021	2022	2023	2024	Total	Post Projection
C33900015 Asphalt Overlay Program													
2030 Funding													
8410 Contribution from Revenue	($1,792,659)		($2,697,581)	($3,198,891)	($3,798,231)	($4,517,440)	($5,420,986)	($5,390,800)	($5,929,880)	($6,522,868)		($39,269,336)	
8601 Roads Res DC Fund	($119,510)		($179,839)	($213,259)	($253,216)	($301,163)	($361,399)	($359,387)	($395,326)	($434,858)		($2,617,957)	
8602 Roads Non-Res DC Fund	($79,674)		($119,892)	($142,173)	($168,810)	($200,775)	($240,932)	($239,591)	($263,550)	($289,905)		($1,745,302)	
Total 2030 Funding	($1,991,843)		($2,997,312)	($3,554,323)	($4,220,257)	($5,019,378)	($6,023,317)	($5,989,778)	($6,588,756)	($7,247,631)		($43,632,595)	
Total C33900015 Asphalt Overlay Program	($1,991,843)		($2,997,312)	($3,554,323)	($4,220,257)	($5,019,378)	($6,023,317)	($5,989,778)	($6,588,756)	($7,247,631)		($43,632,595)	
C50010115 Gateway Implementation													
2030 Funding													
8410 Contribution from Revenue													(492,470)
8601 Roads Res DC Fund	($121,500)		($121,500)	($121,500)	($121,500)	($121,500)	($121,500)	($121,500)				($850,500)	
8602 Roads Non-Res DC Fund	($81,000)		($81,000)	($81,000)	($81,000)	($81,000)	($81,000)	($81,000)				($567,000)	
Total 2030 Funding	($202,500)		($202,500)	($202,500)	($202,500)	($202,500)	($202,500)	($202,500)				($1,417,500)	(492,470)
Total C50010115 Gateway Implementation	($202,500)		($202,500)	($202,500)	($202,500)	($202,500)	($202,500)	($202,500)				($1,417,500)	(492,470)
TOTAL CAPITAL PROJECTS	**($3,978,750)**		**($8,142,745)**	**($3,924,773)**	**($4,506,735)**	**($7,839,757)**	**($6,309,795)**	**($6,276,256)**	**($6,672,734)**	**($7,331,609)**	**($83,978)**	**($55,067,132)**	**(492,470)**

Region of Halton Road Works



PR #	Description	Project Manager	Planned EA Completion	Planned Construction Start	Planned Construction Completion
1437C	10 Sideroad - 2-lane Reconstruction from Ninth Line to Tenth Line	Jennifer Trimble		Spring 2015	Fall 2015
2044B	Steeles Avenue - 4-lane Widening from Eighth Line North to Winston Churchill Boulevard	Bob Wicklund		May-14	Sep-15
2045B	Dundas Street - 6-lane Widening from Oak Park Boulevard to Hwy 403	Jennifer Trimble		Nov-11	Oct-14
2079	Trafalgar Road EA from Cornwall Road to ETR 407	Nick Zervos	Fall 2014		
2124	James Snow Parkway - New 4-lane Road Construction from Steeles Avenue to Boston Church Road	Leonard Verwey		Nov-12	Nov-14
2144	Winston Churchill Blvd - 2-lane Reconstruction from 5 Side Road to 10 Side Road (Lead by Peel)	Tony Finelli		Summer 2017	Winter 2018
2145C	Trafalgar Road - Intersection Improvements at 10 Sideroad	Cengiz Cakmak		Summer 2015	Spring 2016
2186B	Regional Road 25 - 4-lane Widening from Hwy 407 to Lower Base Line	David Collum		Apr-13	Sep-14
2186B	Regional Road 25 - 4-lane Widening from Lower Base Line to Britannia Road	David Collum		Aug-14	Fall 2016
2259B	Dundas Street - 6 - lane Widening form Neyagawa Boulevard to Oak Park Blvd	Milan Njegovan		Summer 2016	Fall 2017
2261C	Tremaine Road - 4-lane Construction on new alignment from Main Street to Steeles Avenue	David Collum		Apr-14	Sep-15
2261C	Tremaine Road - 4-lane Construction on new alignment from Steeles Avenue to Campbellville Road including Grade Separation at CPR 16 Mile Creek Bridge and new Interchange at Hwy 401	David Collum		Spring 2015	Summer 2018
2263B	New North Oakville Transportation Corridor (NNOTC) - New 4-lane Road Construction from Regional Road 25 to East of Third Line	David Collum		Jun-14	Jul-15
2263D	New North Oakville Transportation Corridor (NNOTC) - New 4-lane Road Construction from Neyagawa Blvd to Trafalgar Rd	Andrew Gorman		Summer 2015	Summer 2016
2310B	Upper Middle Road - 4-lane Widening from Winston Park to Winston Churchill Blvd	Ray Lau		Spring 2016	Summer 2017
2320B	Steeles Ave - 4-lane Widening from Industrial Dr to Martin St	Cengiz Cakmak		Fall 2016	Fall 2018
2369B	Steeles Ave - 4-lane Widening from James Snow Parkway to Fifth Line South	Leonard Verwey		Mar-12	Sep-14
2369B	Steeles Ave - 4-lane Widening from Fifth Line South to Trafalgar Road	Ray Lau		Spring 2015	Summer 2016
2387B	James Snow Parkway - New 4-lane Road Construction from Street C to Tremaine Road	Dave Collum		Spring 2015	Summer 2016
2388	Neyagawa Boulevard - 4-lane Widening from Dundas Street to Burnhamthorpe Road	Tony Finelli		Spring 2015	Summer 2016
2390B	Ninth Line - 4-lane Widening from Upper Middle Road to Dundas Street	Cengiz Cakmak		Nov-13	Dec-14
2536	New North Oakville Transportation Corridor (NNOTC) - New 4-lane Construction from Trafalgar Road to Ninth Line	Bob Wicklund		Summer 2015	Fall 2016
2550	Dundas Street EA from Brant Street to Bronte Rd	Jeffrey Reid	Fall 2014		
2596	Guelph Line - 2-lane Reconstruction from 1 km North of Derry Road to Conservation Road	Ray Lau		Spring 2015	Fall 2015
2598	Derry Road - 2-lane Reconstruction from Milburough Townline to McNiven Road	Milan Njegovan		Spring 2015	Fall 2015
2667	Britannia Road EA from Tremaine Rd to ETR 407	Alicia Jakaitis	Fall 2014		
2673B	Dundas Street - 6-lane Widening from Bronte Road to Proudfoot Trail	David Collum		Aug-14	Oct-15
2675B	Tremaine Road - 6-lane Widening from Britannia Road to Derry Road	Cengiz Cakmak		May-14	Dec-15
2733E	2014 Resurfacing Program	Milan Njegovan		Sep-14	Dec-14
2749	Derry Road - New Grade Separation at CNR West of Bronte Street	Jennifer Trimble		Apr-13	Jul-15
2751	Dundas Street at Brant Street - Intersection Improvements	Ray Lau		Spring 2015	Winter 2016
2770	Upper Middle Road EA from Neyagawa Blvd to Ninth Line	Jeffrey Reid	Winter 2015		
2829	Guelph Line at Harverster Rd EA - Intersection Improvements, Guelph Line Resurfacing from Fairview Street to Harvester Road	Tony Finelli	Fall 2014	Summer 2015	Fall 2016
2862	No 20 Side Road - Resurfacing from West of First Line to Guelph Line	Ray Lau		Jul-14	Nov-14
2867	Appleby Line at Harvester Road EA - Intersection Improvements	Tony Finelli	Fall 2014	Summer 2016	Winter 2017
2926	James Snow Parkway - Hwy 401 Off Ramp Improvement	Leonard Verwey		Jun-14	Nov-14
2876	Ninth Line EA from Steeles Avenue to 10 Sideroad (4-lane Widening)	Alicia Jakaitis	Fall 2015		
2888	Signal Installation at James Snow Parkway and Trudeau Drive	Tony Finelli		Oct-14	Dec-14
2889	Signal Installation at Trafalgar Rd/Rosegate Way, Guelph Line/Mount Forest Dr, James Snow Parkway/Louis St Laurent Ave, James Snow Parkway/Clark Blvd	Tony Finelli		Nov-14	Jul-15
2960	Trafalgar Rd EA from Steeles Avenue to Highway 7 (4-lane Widening)	Jeffrey Reid	Fall 2015		
3012	Trafalgar Road at Derry Road - Intersection Improvements	Ray Lau		Fall 2015	Fall 2016

Appendix C – Safety Report

REPORT TO THE BOARD OF DIRECTORS

☐ Milton Hydro Holdings Inc.
☒ Milton Hydro Distribution Inc.
☐ Milton Energy & Generation Solutions Inc.
☐ Milton Hydro Services Inc.

Date of Report: April 21, 2015

Submitted By: Frank Lasowski, CEO

Subject: Safety Update

For Board Meeting: April 27, 2015

Agenda Item: 4.1

☒ Standing Report ☐ Follow Up Report ☒ For Discussion
☐ Resolution Required ☐ For Information Only

RECOMMENDATION/MOTION: None

LINKAGE TO STRATEGY:

BACKGROUND:

Department	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2015
Administration	0	0	0										0
Billing & Customer Service	0	0	0										0
Engineering	0	0	0										0
Finance	0	0	0										0
Operations	0	0	0										0
Totals	**0**	**0**	**0**										**0**

Lost Time Injury (Occupational):

- None since last report

ATTACHMENTS: None

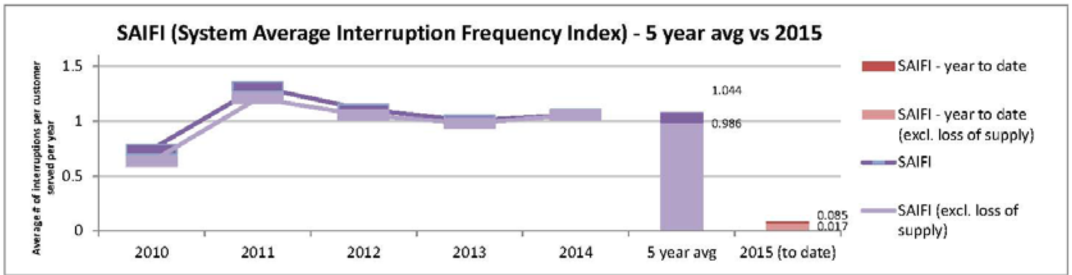
Appendix D – Reliability

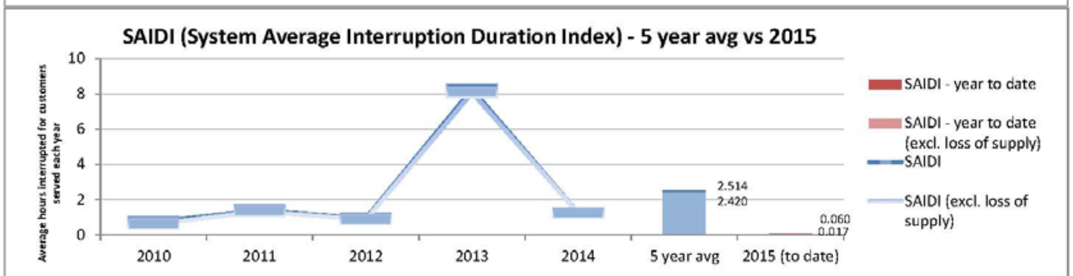
Customer Service Indicators & Service Reliability Indices – Feb, March 2015

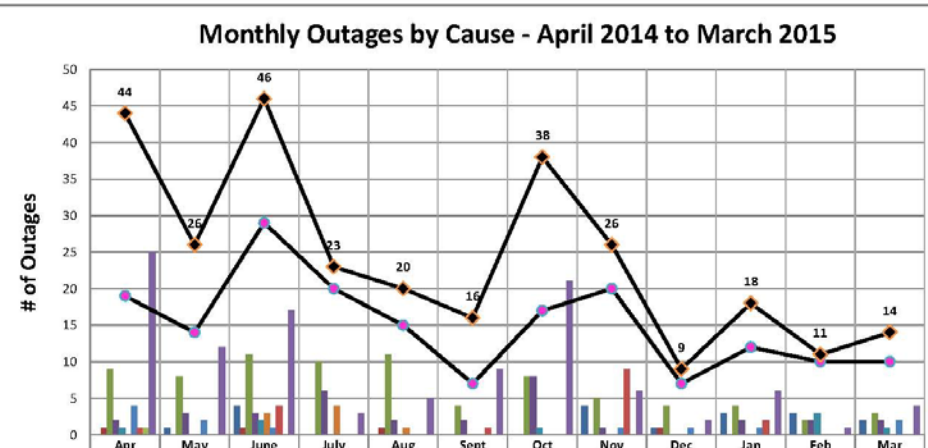
Service Reliability Indices

Customer Service Indicators & Service Reliability Indices – Feb, March 2015

Service Reliability Indices (cont'd)







	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
Unknown/Other		1	4					4	1	3	3	2
Human Element	1		1		1				1			
Defective Equipment	9	8	11	10	11	4	8	5	4	4	2	3
Foreign Interference	2	3	3	6	2	2	8	1		2	2	2
Loss of Supply	1		2				1				3	1
Lightning			3	4	1							
Tree Contact	4	2	1					1	1	1		2
Adverse Weather	1		4			1		9		2		
AdverseEnvironment	1											
Scheduled Outage	25	12	17	3	5	9	21	6	2	6	1	4
Total Unplanned Outages	19	14	29	20	15	7	17	20	7	12	10	10
Total Outages	44	26	46	23	20	16	38	26	9	18	11	14

Appendix E – Commitment to Stakeholders

MILTON HYDRO COMMITMENT TO STAKEHOLDERS

We affirm to all our stakeholders that we will conduct our business in a transparent manner with respect and care for the quality of service to our customers, the Health and Safety of our employees and the public and protection of the Environment. We will implement those strategies that build successful businesses and achieve the greatest benefit for all our stakeholders without compromising the ability of future generations to meet their needs.

We will continuously improve our practices in light of advances in technology and new understandings in reliability, safety, health and environmental science. We will make consistent, measurable progress in implementing this commitment throughout our operations.

Highest Standards of Performance, Business Excellence

We will adhere to the highest standards for the safe, reliable provision of services. We will protect our environment, our employees, our customers and the people of the communities in which we do business.

We will strengthen our businesses by making reliability, safety, health and environmental issues an integral part of all business activities and by continuously striving to align our businesses with appropriate balancing of stakeholder expectations.

Goal of Zero Injuries, Illnesses and Incidents

We believe that all injuries and occupational illnesses, as well as safety, environmental and reliability incidents, are preventable, and our goal for all of them is zero. We will promote off-the-job safety for our employees.

We will assess the environmental impact of each facility we propose to construct and will design, build, operate and maintain all our facilities and transportation equipment so they are reliable, safe, and acceptable to local communities and protect the environment.

We will be prepared for emergencies including fire protection and will provide leadership to assist our local communities with their emergency preparedness response capabilities.

Goal of Being an Industry Leader in Minimizing Waste and Emissions

We will strive toward minimal waste generation at the source. Materials will be reused and recycled to minimize the need for treatment or disposal and to conserve resources. Where waste is generated, it will be handled and disposed of safely and responsibly.

We will strive toward minimizing emissions and are dedicated to the elimination of pollutants, giving priority to those that may present the greatest potential risk to health or the environment.

Where past practices have created conditions that require correction, we will responsibly correct them.

Conservation of Energy and Natural Resources, Habitat Enhancement

We will excel in the efficient use of energy, water and other natural resources.

We will manage our land use to minimize impacts on their habitats.

Open and Public Discussion, Influence on Public Policy

We will promote open discussion with our stakeholders about their needs and the service we provide, the materials we use and transport and the impacts of our activities on their safety, health and environment.

We will build alliances with governments, policy makers, businesses and advocacy groups to develop sound policies, laws, regulations and practices that improve reliability, safety, health and the environment.

Management and Employee Commitment, Accountability

The Board of Directors, including the Chief Executive Officer, will receive quarterly reports on pertinent reliability, safety, health and environmental issues and will ensure that policies are in place and actions taken to achieve this commitment.

Compliance with this commitment and applicable laws is the responsibility of every employee and contractor acting on our behalf and a condition of their employment or contract. Management is responsible to educate, train and motivate employees and contractors to understand and comply with this commitment and applicable laws.

Robert Pyatt, Chair
Milton Hydro Distribution Inc.

Frank Lasowski, President/CEO
Milton Hydro Distribution Inc.

February 23, 2015

Appendix F – Capital Project Summary Template

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	
Investment Category	
Project Description	

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	
Customer Contribution	
Net Capital	
O&M Costs	

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	
Customer Load (peak kVA)	

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	
Expected In-Service Date	
Expenditure Timing:	
Q1	
Q2	
Q3	
Q4	

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	
2012	
2013	
2014	
2015	

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Leave to Construct Approval (5.4.5.2.A 7th bullet)

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project (5.4.5.2.B.1a)	
Related Objectives and/or Performance Targets	
Source and Nature of Information used to Justify Project	
Secondary Driver (where applicable)	
Related Objectives and Performance Targets	
Source and Nature of Information used to Justify Project	
Investment Priority	
Analysis of Project and Project Alternatives (5.4.5.2.B.1.c)	

Effect of Investment on System Operation Efficiency and Cost Effectiveness	
Net benefits accruing to customers	
Impact of Investment on Reliability Performance	

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry	
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements **(5.4.5.2.B.4.b)**	

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	

C. Category-Specific Requirements

System Access

Justification of Project (5.4.5.2.C.a)

Factors Affecting the Timing/ Priority of Implementing the Project **(5.4.5.2.C.a – 1st bullet)**	
Factors Relating to Customer Preferences or Input from Customers and other Third Parties **(5.4.5.2.C.a – 2nd bullet)**	
Factors Affecting the Final Costs of the Project (5.4.5.2.C.a – 3rd bullet)	
How Controllable Costs have been Minimized (5.4.5.2.C.a – 4th bullet)	
Other Planning Objectives met by the Project (5.4.5.2.C.a – 5th bullet)	
Technically feasible project options **(5.4.5.2.C.a – 6th bullet)**	
Summary of options analysis **(5.4.5.2.C.a – 7th bullet)**	
Results of the 'Final Economic Evaluation' carried out as per section 3.2 of the DSC **(5.4.5.2.C.a – 8th bullet)**	
REG Investment - Nature and Magnitude of System Impacts, Costs and Cost Recovery **(5.4.5.2.C.a. 9th bullet)**	

Appendix G – Regional Planning Status Letter

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June 25, 2015

Bruno Pereira, P. Eng, MBA
Director of Engineering
Milton Hydro Distribution Inc.
8069 Lawson Rd.
Milton, ON, L9T 5C4

Dear Mr. Pereira:

Subject: Regional Planning Status

In reference to your request for a regional planning status letter, please note that Milton Hydro Distribution Inc. (Milton Hydro) belongs to GTA West and Kitchener-Waterloo-Cambridge-Guelph (KWCG) Regions. Both regions are in Group 1. A map of all planning regions and groups, and a list of Local Distribution Companies (LDCs) in each region is attached in Appendix A and B, respectively.

GTA West Region

GTA West Region is divided into two sub-regions: Northern (referred to as Northwest GTA) and Southern Subregions. An Integrated Regional Resource Planning (IRRP) Report for Northwest GTA Subregion was completed in April 2015. The IRRP Report's recommendations included a plan to provide additional supply capacity to Milton and southern Halton Hills area, currently served by Halton TS. Based on the current load forecast, a new transformer station (Halton TS #2) will be required by 2020 to meet load growth in Milton Hydro service area. The budgetary estimate for the new TS is $29M, and Milton Hydro may be required to make a capital contribution, which will be determined when Milton Hydro formalizes the request for a new transformer station. In addition, Milton Hydro will have to undertake distribution investments in order to integrate the new TS to supply load from this station.

Some of the other needs, such as restoration needs on circuits T38B/T39B, identified in the Northwest GTA IRRP will be addressed through the Independent Electricity System Operator's (IESO) bulk system planning process, or in the next regional planning cycle. The rest of the needs are expected to have no impact on Milton Hydro.

A Scoping Assessment for Southern Subregion was completed in September 2014. Milton Hydro is supplied from Palermo TS, Tremaine TS, and Glenorchy MTS in this Subregion. The study team determined that the needs identified in this subregion can be addressed by wires approach by Hydro One and relevant LDCs or by the IESO's bulk system planning process. The needs in Southern Subregion are expected to have no impact on Milton Hydro.

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The Regional Infrastructure Planning (RIP) phase of the regional planning process for GTA West Region is planned to begin by the end of Q2 2015. The RIP will provide a consolidated wires-only plan to meet the needs in the region for the next 10-year planning horizon. Hydro One will formally notify your organization prior to initiating the RIP phase for this region.

KWCG Region

Milton Hydro is an embedded LDC served by Fergus TS in KWCG Region. An IRRP Report for this region has been completed in April 2015. The RIP process for KWCG Region is planned to begin by the end of Q2 2015. This RIP will provide a consolidated wires-only plan to meet the needs in the region for the next 10-year planning horizon. Hydro One will formally notify your organization prior to initiating the RIP phase for this region.

Two transmission projects have been identified in this region to address the near- and medium-term needs in this region: the first being the Guelph Area Transmission Reinforcement (GATR) project, and the second being the installation of switches on circuits M20D and M21D. Execution of the first project is already underway while the second in the project development phase.

One component of the GATR project involves the installation of two load interrupter switches on 230 kV circuits D6V/D7V at Guelph North Junction. The switches will minimize the impact of interruptions to Milton Hydro customers in the event of the loss of both circuits D6V and D7V. The investments associated with the GATR project are proposed as a network pool cost, and there is no cost implication for Milton Hydro.

Hydro One looks forward to working with Milton Hydro in executing the regional planning process. Please feel free to contact me if you have any further questions.

Sincerely,

Ajay Garg, Manager – Regional Planning Coordination
Hydro One Networks Inc.

Cc:
Bing Young, Director – System Planning, Hydro One Networks Inc.
Farooq Qureshy, Manager – System Planning (Central and East), Hydro One Networks Inc.

Appendix A: Map of Ontario's Planning Regions

Northern Ontario

Southern Ontario

Greater Toronto Area (GTA)

Group 1	Group 2	Group 3
Burlington to Nanticoke	East Lake Superior	Chatham/Lambton/Sarnia
Greater Ottawa	London area	Greater Bruce/Huron
GTA East	Peterborough to Kingston	Niagara
GTA North	South Georgian Bay/Muskoka	North of Moosonee
GTA West	Sudbury/Algoma	North/East of Sudbury
Kitchener- Waterloo-Cambridge-Guelph ("KWCG")		Renfrew
Metro Toronto		St. Lawrence
Northwest Ontario		
Windsor-Essex		

Appendix B: List of LDCs for Each Region

[Hydro One as Upstream Transmitter]

Region	LDCs
1. Burlington to Nanticoke	• Brant County Power Inc. • Brantford Power Inc. • Burlington Hydro Inc. • Haldimand County Hydro Inc. • Horizon Utilities Corporation • Hydro One Networks Inc. • Norfolk Power Distribution Inc. • Oakville Hydro Electricity Distribution Inc.
2. Greater Ottawa	• Hydro 2000 Inc. • Hydro Hawkesbury Inc. • Hydro One Networks Inc. • Hydro Ottawa Limited • Ottawa River Power Corporation • Renfrew Hydro Inc.
3. GTA North	• Enersource Hydro Mississauga Inc. • Hydro One Brampton Networks Inc. • Hydro One Networks Inc. • Newmarket-Tay Power Distribution Ltd. • PowerStream Inc. • PowerStream Inc. [Barrie] • Toronto Hydro Electric System Limited • Veridian Connections Inc.
4. GTA West	• Burlington Hydro Inc. • Enersource Hydro Mississauga Inc. • Halton Hills Hydro Inc. • Hydro One Brampton Networks Inc. • Hydro One Networks Inc. • Milton Hydro Distribution Inc. • Oakville Hydro Electricity Distribution Inc.

5. Kitchener- Waterloo-Cambridge-Guelph ("KWCG")	• Cambridge and North Dumfries Hydro Inc. • Centre Wellington Hydro Ltd. • Guelph Hydro Electric System - Rockwood Division • Guelph Hydro Electric Systems Inc. • Halton Hills Hydro Inc. • Hydro One Networks Inc. • Kitchener-Wilmot Hydro Inc. • Milton Hydro Distribution Inc. • Waterloo North Hydro Inc. • Wellington North Power Inc.
6. Metro Toronto	• Enersource Hydro Mississauga Inc. • Hydro One Networks Inc. • PowerStream Inc. • Toronto Hydro Electric System Limited • Veridian Connections Inc.
7. Northwest Ontario	• Atikokan Hydro Inc. • Chapleau Public Utilities Corporation • Fort Frances Power Corporation • Hydro One Networks Inc. • Kenora Hydro Electric Corporation Ltd. • Sioux Lookout Hydro Inc. • Thunder Bay Hydro Electricity Distribution Inc.
8. Windsor-Essex	• E.L.K. Energy Inc. • Entegrus Power Lines Inc. [Chatham-Kent] • EnWin Utilities Ltd. • Essex Powerlines Corporation • Hydro One Networks Inc.
9. East Lake Superior	N/A → This region is not within Hydro One's territory

10. GTA East	• Hydro One Networks Inc. • Oshawa PUC Networks Inc. • Veridian Connections Inc. • Whitby Hydro Electric Corporation
11. London area	• Entegrus Power Lines Inc. [Middlesex] • Erie Thames Power Lines Corporation • Hydro One Networks Inc. • London Hydro Inc. • Norfolk Power Distribution Inc. • St. Thomas Energy Inc. • Tillsonburg Hydro Inc. • Woodstock Hydro Services Inc.
12. Peterborough to Kingston	• Eastern Ontario Power Inc. • Hydro One Networks Inc. • Kingston Hydro Corporation • Lakefront Utilities Inc. • Peterborough Distribution Inc. • Veridian Connections Inc.
13. South Georgian Bay/Muskoka	• Collingwood PowerStream Utility Services Corp. (COLLUS PowerStream Corp.) • Hydro One Networks Inc. • Innisfil Hydro Distribution Systems Limited • Lakeland Power Distribution Ltd. • Midland Power Utility Corporation • Orangeville Hydro Limited • Orillia Power Distribution Corporation • Parry Sound Power Corp. • Powerstream Inc. [Barrie] • Tay Power • Veridian Connections Inc. • Veridian-Gravenhurst Hydro Electric Inc. • Wasaga Distribution Inc.

14. Sudbury/Algoma	• Espanola Regional Hydro Distribution Corp. • Greater Sudbury Hydro Inc. • Hydro One Networks Inc.
15. Chatham/Lambton/Sarnia	• Bluewater Power Distribution Corporation • Entegrus Power Lines Inc. [Chatham-Kent] • Hydro One Networks Inc.
16. Greater Bruce/Huron	• Entegrus Power Lines Inc. [Middlesex] • Erie Thames Power Lines Corporation • Festival Hydro Inc. • Hydro One Networks Inc. • Wellington North Power Inc. • West Coast Huron Energy Inc. • Westario Power Inc.
17. Niagara	• Canadian Niagara Power Inc. [Port Colborne] • Grimsby Power Inc. • Haldimand County Hydro Inc.* • Horizon Utilities Corporation • Hydro One Networks Inc. • Niagara Peninsula Energy Inc. • Niagara-On-The-Lake Hydro Inc. • Welland Hydro-Electric System Corp. • Niagara West Transformation Corporation* *Changes to the May 17, 2013 OEB Planning Process Working Group Report
18. North of Moosonee	N/A → This region is not within Hydro One's territory

19. North/East of Sudbury	• Greater Sudbury Hydro Inc. • Hearst Power Distribution Company Limited • Hydro One Networks Inc. • North Bay Hydro Distribution Ltd. • Northern Ontario Wires Inc.
20. Renfrew	• Hydro One Networks Inc. • Ottawa River Power Corporation • Renfrew Hydro Inc.
21. St. Lawrence	• Cooperative Hydro Embrun Inc. • Hydro One Networks Inc. • Rideau St. Lawrence Distribution Inc.

IESO Letter of Comment

Milton Hydro Distribution Inc.

Renewable Energy Generation Investments Plan 2016 – 2020

August 24, 2015

Independent Electricity System Operator

Introduction

On March 28, 2013, the Ontario Energy Board ("the OEB" or "Board") issued its Filing Requirements for Electricity Transmission and Distribution Applications; Chapter 5 – Consolidated Distribution System Plan Filing Requirements (EB-2010-0377). Chapter 5 implements the Board's policy direction on 'an integrated approach to distribution network planning', outlined in the Board's October 18, 2012 Report of the Board - A Renewed Regulatory Framework for Electricity Distributors: A Performance Based Approach.

As outlined in the Chapter 5 filing requirements, the Board expects that the Ontario Power Authority[1] ("OPA") comment letter will include:

- the applications it has received from renewable generators through the FIT program for connection in the distributor's service area;
- whether the distributor has consulted with the OPA, or participated in planning meetings with the OPA;
- the potential need for co-ordination with other distributors and/or transmitters or others on implementing elements of the REG investments; and
- whether the REG investments proposed in the DS Plan are consistent with any Regional Infrastructure Plan.

Milton Hydro Distribution Inc. – Distribution System Plan

On August 10, 2015, Milton Hydro Distribution Inc. ("Milton Hydro") provided its Renewable Energy Generation Investments Information ("Plan") to the IESO as part of its 5-year Distribution System Plan from 2016-2020. The IESO has reviewed Milton Hydro's Plan and has provided its comments below.

OPA FIT/microFIT Applications Received

Milton Hydro's Plan indicates that as of June 22, 2015, it had a total of 266 microFIT projects totalling 1,918 kW of capacity connected to its distribution system. The Plan indicates 8 FIT projects totalling 1841.2 kW in capacity are connected, and 8 FIT projects with a total capacity of 1907.5 kW are in the queue awaiting connection to Milton Hydro's distribution system.

According to the IESO's information, as of June 30, 2015, the IESO has offered contracts to 264 microFIT projects representing a capacity of 1,853 kW. The IESO has also offered contracts to 15 FIT projects totalling 3,559 kW of capacity, all of which are still active in Milton Hydro's service territory. The renewable energy generation connections information in Milton Hydro's Plan is therefore reasonably consistent with that of the IESO.

[1] On January 1, 2015, the Ontario Power Authority ("OPA") merged with the Independent Electricity System Operator ("IESO") to create a new organization that will combine the OPA and IESO mandates. The new organization is called the Independent Electricity System Operator.

Independent Electricity System Operator
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Consultation / Participation in Planning Meetings; Coordination with Distributors / Transmitters / Others; Consistency with Regional Plans

The IESO notes that Milton Hydro is part of the GTA West and Kitchener-Waterloo-Cambridge-Guelph ("KWCG") regions for regional planning purposes, both are "Group 1" priority regions.

In the KWCG region, Milton Hydro is a fully embedded utility of Hydro One Distribution but was not part of the working group for the Integrated Regional Resource Plan ("IRRP") published on April 28, 2015.[2] Under the new regional planning process endorsed by the OEB in August 2013, the host distributor (in this case Hydro One Distribution) is required to gather information from their respective embedded LDCs for regional planning purposes, but does not require that the embedded LDCs be involved in the regional planning process. Going forward, the IESO will maintain on-going communication with the embedded LDCs in the respective planning regions. For new regional planning studies, the IESO will encourage embedded LDCs to participate in the regional planning process and to be part of the IRRP working group.

More recently, the IESO has invited all the embedded LDCs in the KWCG region to Hydro One's KWCG Regional Infrastructure Plan meetings. However, their participation is not mandatory. Milton Hydro is nonetheless informed of developments in regional planning activities within its territory.

GTA West Region

The GTA West region is divided into the Northern ("Northwest GTA") and Southern ("Southwest GTA") sub-regions.

For the Northwest GTA sub-region an Integrated Regional Resource Plan ("IRRP") was prepared by the IESO on behalf of a Technical Working Group composed of the IESO, Hydro One Brampton, Halton Hills Hydro, Hydro One Networks Inc. (Lead Transmitter), Hydro One Networks Inc. (Distribution), and Milton Hydro. This IRRP was also published on April 28, 2015.[3]

For the Southwest GTA sub-region, Milton Hydro was part of the study team to the Needs Screening Report finalized on May 30, 2014[4], and the subsequent Scoping Assessment Outcome Report published on September 19, 2014.[5] The Scoping Assessment concluded that with the load restoration needs being addressed through other planning studies, that regional coordination via a Regional Infrastructure Plan (RIP) or an IRRP is not needed at this time.

[2] The KWCG IRRP can be found on the IESO website at http://www.ieso.ca/Documents/Regional-Planning/KWCG/2015-KWCG-IRRP-Report.pdf

[3] The Northwest GTA IRRP can be found on the IESO website at http://www.ieso.ca/Documents/Regional-Planning/GTA_West/2015-Northwest-GTA-IRRP-Report.pdf

[4] The Southwest GTA sub-region Needs Screening Report can be found on the Hydro One Networks Inc. website at http://www.hydroone.com/RegionalPlanning/GTAWest/Documents/Needs%20Assessment%20Report%20-%20GTA%20West%20-%20Southern%20Subregion.pdf

[5] The Southwest GTA sub-region Scoping Assessment Outcome Report can be found on the IESO website at http://www.ieso.ca/Documents/Regional-Planning/GTA_West/Scoping-Assessment-Outcome-Report-September-2014.pdf

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With the exception of Palermo TS owned by Hydro One, Milton Hydro indicates that it has considerable capacity to connect renewable energy generation forecast. As a result, the LDC is not planning any capital investments to accommodate REG connections over the 5-year period (2016 to 2020).

The IESO looks forward to participating with Milton Hydro Distribution Inc. on regional planning activities and appreciates the opportunity to comment on the renewable energy generation information provided as part of its Distribution System Plan.

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Innovative Research Group, Inc.

Toronto • Vancouver

Customer Consultation Report

2016-2020 Distribution System Investment Plan Review

July 2015

Prepared for:

Milton Hydro Distribution Inc.
8069 Lawson Road
Milton, Ontario
L9T 5C4

Customer Consultation Report

2016-2020 Distribution System Investment Plan Review

July 2015

This report has been prepared by Innovative Research Group Inc. ("INNOVATIVE") for Milton Hydro Distribution Inc. ("Milton Hydro").

The conclusions drawn and opinions expressed are those of the authors.

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Introduction

About this Consultation

In the Spring of 2015, Milton Hydro Distribution Inc. ("Milton Hydro") commissioned Innovative Research Group Inc. ("INNOVATIVE") to design and implement a customer engagement research program in order to collect and document customer feedback as part of the development of Milton Hydro's 2016-2020 Distribution System Investment Plan.

This Distribution System Investment Plan incorporates both operational and infrastructure components and is a key component of Milton Hydro's 2016-2020 rate application to the Ontario Energy Board ("OEB").

As part of its *Renewed Regulatory Framework for Electricity ("RRFE")*, the OEB now requires that all Ontario Local Distribution Companies ("LDC"s) demonstrate that they are providing services in a manner that responds to identified customer needs and preferences[1]. LDCs, when submitting a rate application to the OEB, are now required to demonstrate that they have consulted with customers, and that they have taken customer needs and preferences into consideration when developing their Distribution System Investment Plans.

Because this "consumer-centric" approach is a new requirement of the OEB, there are currently no established standard practices for undertaking these customer engagement activities. There are many options available for this type of customer consultation. The following section explains how we approached this engagement.

Approach to Meaningful Customer Engagement

Engaging customers in a meaningful consultation can be a challenge. Customers often feel they don't know enough to be able to contribute, or they may want to avoid taking what may be perceived as controversial positions on issues. Too often, customers prefer to remain silent and let others do the talking for them. Furthermore, many customers are simply not aware that consultations are taking place, and so even those who want to participate are not able to. All of these factors combine to make it extremely challenging to engage a representative group of customers.

An additional challenge when consulting with customers on a Distribution System Investment Plan is that most customers simply don't understand how the distribution system works, including the role of LDCs and the issues and challenges they face. This has been well documented in OEB research and in INNOVATIVE's own experience in other studies.

In order to overcome the challenges of engaging a representative group of customers, and a lack of knowledge, our customer consultation process has been developed based on three key principles:

1. We use random-sampling research elements to ensure a representative sample of customers are engaged.

[1] OEB Renewed Regulatory Framework for Electricity Sections 2.4.2, 5.0, and 5.0.4.

2. We focus on fundamental value choices. We pose questions that ask people to choose between key outcomes rather than focus on the technical questions of how to reach those outcomes.
3. We create an opportunity for the public to learn the basics of the distribution system so they can provide a more informed point of view.

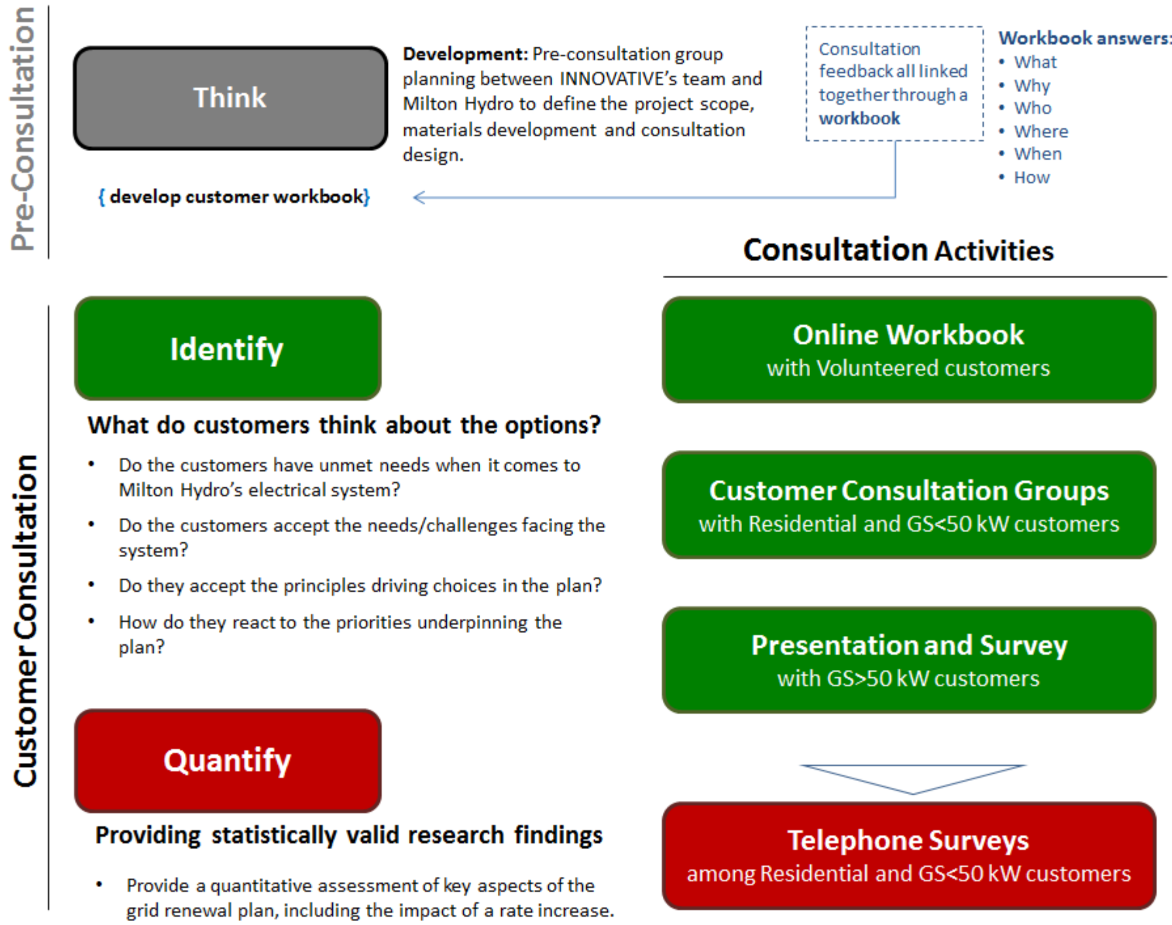
Customer Consultation Overview

With these three guiding principles in mind, INNOVATIVE has designed a customer engagement program which combines both qualitative and quantitative research elements. The program includes various phases designed to capture feedback from multiple customer rate classes as pertains to Milton Hydro's 2016-2020 Distribution System Investment Plan.

Milton Hydro's customer engagement program was comprised of four elements.

1. **General Service < 50kW and Residential Customer Consultation Groups:** This initial, qualitative, phase of the consultation was designed to educate consumers about the electricity system, Milton Hydro's role within it, and the utility's spending and investment plans for the next five years. A workbook was used (see details below) to provide information on the distribution system, the challenges Milton Hydro is responding to, and their proposed capital investment and operating spend to maintain system reliability. The workbook also indicated the estimated rate impact for customer. These groups were randomly recruited and held in Milton. Participants were provided incentives in recognition of their time commitment.
2. **Survey of General Service > 50kW Customers:** A self-administered survey with this rate class was distributed at a breakfast session that was hosted and facilitated by Milton Hydro executives. The survey was designed by INNOVATIVE to gather feedback in response to a presentation that outlined the challenges facing Milton Hydro, their planned capital investment and operating spend, and the rate impact for this customer class. All General Service > 50kW customers received an invitation from Milton Hydro to attend this event.
3. **Online Workbook-based Survey:** An online survey was developed based on the workbook that was used in the qualitative consultation groups. This survey was publicized by Milton Hydro so that all customers had an opportunity to go online to complete the survey. As with other phases of the research program, this phase was designed to educate customers and to gather their feedback on Milton Hydro's Distribution System Investment Plan.
4. **Random Telephone Surveys**: INNOVATIVE conducted telephone surveys with residential and General Service (GS < 50kW) customers to provide a quantitative assessment of key aspects of the system plan. Customer lists for both respondent groups were provided by Milton Hydro and the sample was randomly selected by INNOVATIVE.

There were three stages in developing and implementing this consultation as illustrated in the diagram below.



1. In the first, **think** stage of the process, INNOVATIVE and Milton Hydro worked together to develop a workbook that provided an overview of the distribution system, Milton Hydro's capital investment and OM&A spending plans, and the estimate rate impact of these plans. Questions were included throughout the workbook to gather customer input in response to the information being presented to them.
2. The second step was to **identify** the range of views held by the public regarding the system plan through the qualitative elements of the process. This included holding two customer discussion groups using randomly recruited samples of residential and general service customers.
3. The third and final step was designed to **quantify** customer input using randomly recruited telephone surveys. These telephone surveys provide generalizable conclusions that can be applied to the broader population of Milton Hydro customers.

Workbook Development

A lack of consumer familiarity with and understanding of Ontario's electricity system was a key challenge to overcome when designing this research program. There is also a lack of understanding (often combined with misinformation) regarding Milton Hydro's role within the provincial system. Furthermore, Milton Hydro's proposed Distribution System Plan, capital investment plan and OM&A budget are lengthy documents utilizing technical language. We needed to condense this material and present it in a consumer-friendly format in order to educate consumers and elicit more informed responses to questions regarding their needs and preferences.

This was accomplished with the development of a 26 page workbook. The consultation workbook was developed by INNOVATIVE and Milton Hydro in the Spring of 2015. INNOVATIVE provided a framework for the workbook, which contained background information on the rate application process and the provincial electricity system. All content specific to Milton Hydro was provided by the utility. Milton Hydro executives gave the final sign-off on the workbook prior to the commencement of the research activities.

The final consultation workbook had six distinct chapters:

1. **What is this Consultation About?** The purpose of the discussion, where the discussion fits in the context of electricity planning in Ontario.
2. **Electricity 101**: How the overall system works and the players involved in operating and regulating the system as it relates to Milton Hydro's customers.
3. **Milton Hydro's Distribution System Today**: A discussion of the structure and key elements of Milton Hydro's distribution system.
4. **System Reliability**: A brief review of system reliability figures
5. **Cost Pressures**: A discussion of the various challenges facing Milton Hydro's distribution system and an overview of recent and current initiatives to manage the challenges. This section provided an overview on forecasted capital investments and operating spending for 2016-2020.
6. **What the Plan Means for You**: A section covering the estimated impact on rates and overall reaction to the investment plan.

This workbook was used in the consultation groups and the online survey. References to rate impact were customized to the specific rate class, be it residential or General Service <50kW. As the customers went through the consultation workbook, they responded to questions relating to system reliability, system challenges, and preferences on the direction of Milton Hydro's proposed system plan, capital investment and operating spend.

The questions progressed from general questions assessing customer needs to more specific questions gauging customer preferences. Initial questions included a basic satisfaction question and an open-ended question on how Milton Hydro could improve its service. This allowed customers to raise whatever issues they wished. Subsequent questions asked about outages – experiences, satisfaction with Milton Hydro's response, and impact of outages.

When it came to assessing customer preferences, the focus was on value choices as opposed to technical considerations. Key topics for preferences included:

- What should Milton Hydro's priority be when planning its level of investment in replacing aging infrastructure?

- Should Milton Hydro invest in modernizing the grid?
- How well does Milton Hydro's investment plan respond to cost drivers?

The final substantive question asked about the cost of the plan and the outcomes it planned to achieve. In other research, a question of this sort might be accompanied by a simple support or oppose response scale, however we have found that this type of scale does not effectively capture customer responses in this context, and so we included an option that allowed respondents to indicate their displeasure with a rate increase even though they may agree it is necessary. We gave customers three options to choose from as well as a "don't know" option:

- The rate increase is reasonable and I support it
- I don't like it, but I think the rate increase is necessary
- The rate increase is unreasonable and I oppose it
- Don't know

The workbook concluded with a final set of five questions to assess the workbook and process itself.

The workbook for residential customers can be found in the **Appendix** of this report. The workbook for General Service customers is virtually identical, with minor modifications to tailor it for that rate class.

Executive Summary

This section provides a high level summary of the findings of the customer engagement research. Subsequent sections of the report will provide more detailed results.

This summary includes feedback from the 29 customers who participated in the qualitative stages of the consultation, as well as the 642 customers who completed the online workbook survey. It highlights the research with the 620 customers who completed a telephone survey, where we quantified the needs and preferences of Milton Hydro's customer population.

Customer Needs & Preferences

Customers are Highly Satisfied

Across all phases of the customer engagement research, customers indicated a healthy level of satisfaction with Milton Hydro. While almost all participants in the focus groups reported being only *somewhat satisfied*, the generalizable telephone survey results found that 40% of residential customers and 33% of General Service (<50kW) say they are *very satisfied* with the service they currently receive from Milton Hydro.

Overall Satisfaction across Consultation Activities:

Response	Directional (Focus Groups)		Directional (GS>50kW)	Directional (Online Workbook)		Generalizable (Telephone Surveys)	
	RS	GS	GS	RS	GS	RS	GS
Very satisfied	0	1	7	43%	6	40%	33%
Somewhat satisfied	6	4	4	46%	8	46%	50%
Somewhat dissatisfied	2	2	0	7%	3	6%	9%
Very dissatisfied	0	0	0	3%	1	3%	6%
Don't know / Refused	0	0	1	2%	0	5%	3%
TOTAL	**n=8**	**n=7**	**n=14**	**n=624**	**n=18**	**n=504**	**n=120**

Note: "GS" = general service customers (<50kW unless otherwise indicated), while "RS" = residential customers

When asked what Milton Hydro could do to improve their service, 29% of telephone survey respondents (residential) indicated that there is nothing they can do because they are already satisfied. Lower rates (32%) was the most commonly-cited suggestion for improvement. A handful (6%) mentioned reduced outages, which is indicative of the trade-off customers must make in terms of their preference: do they want lower rates, or do they want improved reliability? In the telephone survey, we probed to determine the extent to which customers want Milton Hydro to invest in maintaining the current number of outages, versus spending more with the goal of reducing the number of outages.

Familiarity with Milton Hydro

In all phases of the customer consultation research, it was apparent that customers have a limited level of understanding of the provincial electricity system and Milton Hydro's role within it. However, while they may not be overly familiar with the system and how Milton Hydro fits in, this doesn't appear to be impeding customer satisfaction.

This lack of familiarity was most evident when discussing the breakdown of the electricity bill during the qualitative phase, when most participants were surprised to learn how little of their bill is actually remitted to Milton Hydro. The telephone surveys confirmed this lack of awareness with only 31% of residential and 27% of General Service customers indicating that they understand how much of their monthly bill goes to the utility.

Reliability of Service

In the qualitative phase, the discussion about reliability tended to drift toward how Milton Hydro responds to outages, as opposed to how many outages people are experiencing. Most participants reported only one or two outages (if any), and said they found this frequency to be reasonable. There was more concern about the utility's communication about and during outages.

The telephone survey revealed that half (50%) of residential customers and even more (54%) General Service customers were impacted as a result of the ice storm of 2013. Customers were generally satisfied with Milton Hydro's response to the storm, and most had no suggestions on how service during the storm could have been improved upon.

While most residential and General Service customers have experienced at least one outage in the past 12 months, they usually last for less than 15 minutes and are considered at most only a minor inconvenience.

Approaching the issue from another angle, we asked customers if Milton Hydro should invest in the system with the goal of *maintaining* the current number of outages, or should the goal be to *reduce* that figure. Most (54%) residential customers and a plurality (46%) of General Service customers prefer a "spend to maintain" strategy, suggesting that they are satisfied with current level of reliability (or, at least that they are not willing to pay more to improve upon it). Further, the majority of both customer rate classes (52%) prefer a "spend to maintain" strategy with regard to the duration of outages.

Electricity Affordability

In the telephone survey, a majority of residential (57%) and General Service (64%) customers reported that their monthly electricity bill has an impact on their household/organization finances in that they must put off spending or do without in other areas. In addition, many *strongly agree* (48% residential, 52% General Service) that Milton Hydro should be doing more to help customers reduce their consumption level and costs.

In contrast, 53% of residential customers and 50% of General Service customers agree that they would be willing to pay more for their electricity if it would mean improved reliability. Further, a majority of residential (56%) and General Service customers (52%) say they can afford to pay more for electricity, but they worry about the impact an increase would have on others.

Customer Reaction to Rate Impacts

After providing them with estimated rate impacts based on Milton Hydro's proposed Distribution System Investment Plan, respondents in all phases of the research were given four responses to choose from:

- The rate increase is reasonable and I support it
- I don't like it, but I think the rate increase is necessary
- The rate increase is unreasonable and I oppose it
- Don't know

Thus, respondents can express outright support for the rate increase, reluctant support for the increase (don't like it but think it is necessary), or outright opposition. For the purposes of this analysis, outright and reluctant support are combined to give a total measure of "social acceptance".

In all "Directional" aspects of the research (see table below), most indicated that they don't like the increase but find it necessary. However, in the telephone survey – which is representative of Milton Hydro's customer base – the proportion who outright accept the estimated rate increase is close to, or even greater than (in the case of General Service) the proportion who only reluctantly accept it. Among both rate classes, a total of 68% are prepared to accept the rate increase. Even amongst financially strained households or businesses, a solid majority (61% in each rate class) indicate social acceptance of the rate increase.

Q: Considering what you know about the local distribution system, which of the following best represents your point of view?

Response	Directional (Focus Groups)		Directional (GS>50kW)	Directional (Online Workbook)		Generalizable (Telephone Surveys)	
	RS	GS	GS	RS	GS	RS	GS
The rate increase is reasonable and I support it	1	0	3	14%	3	33%	37%
I don't like it, but I think the rate increase is necessary	5	4	10	52%	9	36%	32%
The rate increase is unreasonable and I oppose it	1	1	1	28%	4	25%	28%
Don't know / Refused	1	2	0	5%	2	7%	3%
TOTAL	**n=8**	**n=7**	**n=14**	**n=624**	**n=18**	**n=504**	**n=120**

Note: "GS" = general service customers (<50kW unless otherwise indicated), while "RS" = residential customers

Workbook-based Facilitated Discussions

Customer Consultation Groups
with Residential and General Service (GS) <50 kW customers

PURPOSE: To gain qualitative input on Distribution System investment plans and rate impact for Milton Hydro from residential and GS < 50 kW customers and to obtain feedback into survey design

Summary

General Satisfaction:

Overall, satisfaction with Milton Hydro is rated highly among both residential and General Service customers who participated in the focus groups. In response to the question asked in the participant workbook, only two participants in each group indicated dissatisfaction with the service they receive from Milton Hydro. Furthermore, participants were also quite satisfied with how Milton Hydro responded to the ice storm of 2013.

System Reliability:

The majority of General Service participants experienced three or more outages in the year prior, however only two found this frequency to be unreasonable. The severity of the impact of these outages varies depending on how reliant a business is on electricity. Some businesses rely on systems that can be affected by even the smallest flicker, resulting in tripped switches and requiring varying lengths of time to restart the system. It was also noted that system reliability depends on service area; one participant from the West side reported having no issues in regards to reliability or power quality.

Residential participants are, for the most part, unconcerned with the reliability of the system, finding the number and duration of outages they experience to be acceptable. The impact of the outages they do experience is not as severe as General Service participants and is sometimes even seen as a welcome disconnection from the tech-dependent times we live in.

Areas for Improvement:

Suggested improvements from the General Service group focused largely on customer service. There was some dissatisfaction expressed when it came to connecting and resolving issues with Milton Hydro. Residential participants were most concerned with communication and education regarding their electricity consumption. These participants felt they would benefit from accessing real-time data so they can better manage their monthly expenditures.

Social Acceptance of Plan:

After reviewing the plan as presented in the workbook, participants from both groups are comfortable that Milton Hydro is planning for the future. With only one exception, all participants who offered an opinion felt that Milton Hydro is planning at least *somewhat well*. Furthermore, social acceptance is high in both groups. Only one participant in each group found the rate increase to be unreasonable; and while the majority of participants do not like the idea of an increase, they acknowledge its necessity for Milton Hydro to continue providing the level of service they are accustomed to.

The following table illustrates these findings.

Q: Considering what you know about the local distribution system, which of the following best represents your point of view?

Response	GS	RS	COMBINED
The rate increase is reasonable and I support it	0	1	1
I don't like it, but I think the rate increase is necessary	4	5	9
The rate increase is unreasonable and I oppose it	1	1	2
Don't know	0	0	0
Missing value	2	1	3
TOTAL	7	8	15

Note: "GS" = general service less than 50 kW customers, while "RS" = residential customers

Methodology

About the General Service and Residential Customer Consultation

INNOVATIVE was engaged by Milton Hydro to conduct General Service and Residential customer consultation sessions designed to identify the needs and preferences of consumers as they relate to the utility's proposed spending on the distribution system.

The consultation sessions were held in Milton on June 10th, 2015. A total of 15 General Service and residential customers participated in these consultation sessions.

General Service under 50 kW Rate Class	7 participants
Residential Rate Class	8 participants

Recruiting Consultation Participants

General Service customers in the under 50 kW rate class were randomly selected from customer lists and then screened by telephone for appropriateness as session participants. These customers qualified for the consultation if they manage or oversee their business' electricity bill. This was to ensure that they were at least somewhat knowledgeable of their electricity costs and could have an informed discussion on the impact of the proposed rate increase.

Residential customers were screened to ensure they are the person in the household that has primary or shared responsibility for paying the electricity bill.

All customer lists were provided to INNOVATIVE by Milton Hydro.

An incentive of $100 was provided to all General Service and $80 to all Residential customers who participated in the consultation sessions.

All consultation sessions were video recorded to verify participant feedback and verbatim quotes.

Consultation Session Structure

The consultation sessions were structured around the themes contained in the workbook that was developed by INNOVATIVE and Milton Hydro staff in May 2015.

The workbook themes included the following:

1. What is this Consultation About?
2. Electricity 101
3. Milton Hydro's Distribution System Today
4. System Reliability
5. Cost Pressures
6. What the Plan Means for You

At the start of the sessions, the facilitator gave an overview explaining the purpose of the consultation and why Milton Hydro is seeking feedback from General Service and Residential customers.

After explaining the purpose of the consultation, hardcopy workbooks were distributed to act as a session guide and for participants to record their answers to the questions contained within.

The facilitator then led the participants through the workbook section by section to ensure they understood the information and to answer any questions about the content.

When it came to the questions within the workbook, participants were asked to fill in their answers independently. The facilitator then led a group discussion on the answers participants provided and what the various issues meant for them or their businesses.

Hardcopy workbooks were collected from the participants at the conclusion of each consultation session.

Each consultation session ran for approximately 2 hours.

Informing the Consultation Process

In addition to identifying customer needs and preferences as they relate to the proposed distribution system plan, feedback collected from this phase of the consultation was used to inform the design of the telephone survey consultation phase of Milton Hydro's customer engagement program.

NOTE: Results contained within this report are based on a limited sample and should be interpreted as directional only.

Participant Feedback

The following sections highlight the general feedback from each consultation group.

General Service under 50 kW Rate Class

To begin the consultation, participants were introduced to the format and purpose of the session. The facilitator explained what the consultation is about, why Milton Hydro is holding such a consultation and why consumer feedback is important. Additionally, a central focus of this section was to familiarize participants with the electricity system itself. They were presented with a breakdown of the different components of the system and their functions. They were also shown how their electricity bill is broken down and what portion of it is allocated to Milton Hydro.

During this introduction period participants were encouraged to ask any questions that might arise. At the end of this discussion they were asked how well they felt they understood the parts of the electricity system, how they work together and which services Milton Hydro is responsible for. All participants felt they understood this at least *somewhat well* (*very well*: 2; *somewhat well*: 5).

General Satisfaction

The majority of participants are satisfied with the service they receive from Milton Hydro; only two indicated dissatisfaction in the workbook (*very satisfied*: 1; *somewhat satisfied*: 4; *somewhat dissatisfied*: 2).

> *I'm very satisfied. Nothing really [could be improved]. It's pretty well, as far as electricity comes in and how things are. I'm worried I have more power consumption because of the equipment I have.*

Improving Service of the Local Distribution System

Participants were asked if there was anything in particular that could be done to improve service to their organization. One participant related their experience with the billing system that began a brief discussion. This participant has accounts with several LDCs and made a comparison of the quality of customer service they receive. Milton Hydro was found to be more difficult to interact with than other LDCs. While other participants were unable to make such a comparison, there was agreement that customer service from Milton Hydro could be improved upon. The key message was that participants would appreciate and benefit from more flexible billing practices, and that customer service interactions could be improved.

> *Of course I pay every time. Everywhere else, I never get a call; it will come to the next bill if I miss it. But with Milton Hydro, right after five days, or whatever it is, somebody will make a call. And that is very annoying, because I'm paying every time. I've never missed a month and it's just one or two days and they call right away. It's not a reminder. A reminder is one thing but it's how it's handled. The people who call are kind of rude.*
>
> *They could improve how they handle calls.*
>
> *I have to agree about the billing having the very aggressive calls two days after. So some sort of flexible billing practice – I know some hydro distributors do allow you to have automated billing where it's averaged out over the year and at the end you play catch-up. It's automated; you know what it is every month so you don't have to go through this.*

The whole point to me is, "Hey guys, here is my credit card. You can charge it to me every time." They don't have that, the system is not there. For Brampton, I have all the systems so I never get a call from them.

I understand that they got to get paid. I'm a business man, I got to get paid. But I'm not calling and being rude to people because they're two days late; I'd lose my customers. But that's because I've got competitors.

Vegetation management was also discussed, and elicited opposing views. There was no consensus on whose responsibility maintaining line-clearance should be.

Being a rural property, they had that program of coming in and trimming the lines. Well, that's up to us now. That program is gone, which is a little aggravating; that can get kind of expensive.

On the same token should I have to pay for people to come onto your property and trim your trees? Ultimately, that's what it would come down to – out of my pocket.

Ice Storm of 2013

Service during the ice storm of 2013 was rated highly. While not every participants' business was affected (*affected*: 4; *not affected*: 3), all participants were at least *somewhat satisfied* with the service they received during this extreme weather event (*very satisfied*: 4; *somewhat satisfied*: 3). One participant commended the line crews on their quick and efficient response.

At least during the storm my building had the power on.

Those guys – we're sitting there quarter after eight on a Saturday morning and we see the Hydro trucks come in. They were half done fixing our lines by the time the supervisor came in.

Communication – which was an important issue throughout the consultation – was also rated highly, with only one participant indicating dissatisfaction in the workbook (*very satisfied*: 1; *somewhat satisfied*: 3: *somewhat dissatisfied*: 1; *don't know*: 2). Twitter was mentioned several times as an effective means of sharing information.

I mentioned it to Milton Hydro when it happened – I said "Hey, our line's down, it's cut in two." When I realized the whole town was out – most of it – I said "You gotta use social media, use Twitter." They got around to it, it took some time. So they tell you "Okay, we're going to focus on these areas," so we knew we were going to have about seven days [without power]. That's all I wanted to know: How long is it going to be out?

We were out for seven days. Not a big deal. We have town water and stuff. They've gotten good about that [communicating], so I retweet everything Hydro says about blackouts all the time.

System Reliability

While the average Milton Hydro customer experiences about one power outage a year, the majority of participants in the group experienced three or more (*none*: 2; *three*: 1; *more than three*: 4). While most participants feel that, ideally no power outage is reasonable, only two found the number of outages their organization experienced in the last 12 months to be unreasonable. It appears that the frequency of outages is dependent on service area.

Since the ice storm, the powers only got out a couple times. It's not a problem on the west side.

Where I am [6th line] it's a big problem. We just had our power out the other day because a tree fell over the line.

Impact of Outages

Businesses are affected by outages very differently based on their daily operations and reliance on electricity. For some businesses, the severity of an outage also depends on the time of day; at certain times key operations are unable to take place.

> *It's a time of day thing. So much of our business is done online. If we can't get online we're toast. One of the outages we had about a year ago, I couldn't forward the phones to the answering system so I was missing calls.*

Two participants operate businesses with an experiential function; a school and a camp. For these types of businesses the cost in terms of dollars is considered to be "minimal", however outages greatly affect their ability to function successfully. Outages can also create the potential for health and safety issues.

> *For us it's a big headache. Kids, it has to be an evacuation. There are third parties involved so there's more process to it. It's a big thing when that [an outage] happens. It's a safety issue as well.*

> *It depends on who's on site. If it's just us we're okay, but nine times out of ten it's city people who have no idea how to behave when the power is out in the country. You have to school them. It becomes an inconvenience. For us cost isn't an issue.*

Brief power outages or "flickers" can sometimes be as costly as longer outages. For manufacturers or businesses that rely heavily on tech systems, the time it takes to restart their systems can cost in terms of lost productivity. Damage to equipment caused by power surges is also a concern.

> *We have a dozen or so that's tripped switches. It takes us 20 minutes or so to get back up. And small stuff – intermittent – it could be as many as 50. It's a pain. If it comes back in three to five minutes, then fine we're back up in 20 more minutes. But any longer than that and the guys are wondering what we're doing.*

> *My first concern is when it [power] goes and comes back is that the equipment is damaged and I have to go and fix it or change it.*

When asked at what length of time the cost and consequences of an outage become more serious, answers range from "just after 15 minutes" to "not until after two hours".

Customer Experience and Expectation

Several participants shared experiences that did not quite line up with their expectations. One customer expressed frustration at the disparity between the effort they put into reducing their consumption and the impact that effort has on their bill.

> *We've done what we can do to control our consumption by going with the retailer and now there's a fellow working with us to retrofit things like light bulbs. You know, we're trying to do as much as we can that way. He sat with us for a good two hours a little while ago. So we're doing that but you know, but you can't run around telling everybody "Turn the lights out, turn the lights out." But we're looking at the other three-quarters of the bill and we're like – but there's nothing you can do about it. You know, we're working our butts off to get the consumption down. But then you look at that other stuff and you go – you're kind of like bashing your head on a wall.*

Participants experience issues that are as unique and specific as their businesses. As such, these issues require an investment of customer care and attention from both parties to find an appropriate solution. Several participants related instances of having difficulty finding satisfactory resolutions, and expressed concern that Milton Hydro doesn't go out of their way to help find these resolutions.

> *I complained to them about a pole that's been leaning for eight years.*
>
> *They just keep passing the buck.*
>
> *It's like talking to a wall. They pass that buck along to everyone they can.*
>
> *We had to phone them three times on a Sunday because a line was down in our driveway. They sent a crew down a ways. Well they were ready to leave because they thought they fixed the problem. They actually called us back, I couldn't believe it. They never called us back during the black out. They called us and told us our area had power because they thought they already had fixed it. I said, "No, we don't. We don't have no power at all." They said it was only going to be another 24 hours and five and a half days later we had power.*

Capital Investment and Operational Budget

In regard to projects focused on replacing aging infrastructure, participants feel that Milton Hydro should invest what is needed in order to maintain reliability; no participants feel that investment should be reduced. Furthermore, almost all participants feel that it is at least *somewhat important* for Milton Hydro to invest in modernizing the grid *now* (*very important*: 4; *somewhat important*: 1; *don't know*: 2). One participant related this to a positive experience they had with Milton Hydro upgrading their business' system.

> *Last week Hydro came in to my office and replaced my thermostat for free. The new one is still very effective. And we appreciate – this is exactly what we need. This manner of upgrade is good.*
>
> *Why should we leave older equipment to save a few bucks? I like anything newer, more efficient and more effective.*

When it comes to determining when pieces of aging infrastructure should be replaced, the group was almost unanimously in opposition to a run-to-failure approach (*replace before breakdown*: 6; *don't know*: 1)

> *No, that would be a cost to my business.*
>
> *It could cause damage to the system.*
>
> *It's like your car. You don't wait until your brakes are gone until you fix them.*
>
> *If a hundred people are affected for about an hour, meh. If it's residential, meh.*
>
> *It's a lagging development. They can't build the grid ahead to support future demands, they're building to catch up to what they need now, and maybe a little bit ahead. They're planning but they can't build it out too much. So who's paying for it? The existing ratepayers are subsidizing for the new development. It says right here 60% of the budget is going to expanding these new things, which will get paid back eventually, but we're not seeing that benefit. We're paying for it but we're not seeing the benefit of that. I'm not sure that's equitable.*

Cost Drivers

After reading through the workbook, most participants felt confident in their understanding of the cost drivers that Milton Hydro is responding to (*very well*: 2; *quite well*: 2; *not very well*: 1; *don't* *know*: 1; *missing value*: 1). There was acknowledgement that the system is complex and that investments need to be made when they are necessary.

> *Lightning just loves those pole top transformers. Not much you can do about that.*

Proposed Plan and Rate Impact

The final portion of the consultation focused on how participants felt about the plan as a whole. Only one felt that Milton Hydro is *not planning very well* for the future.

> *The plan is to have frequent but shorter outages or have fewer but longer outages. That's not really a plan. As someone who's been sitting here for two hours I don't really see this as a plan. I see it as some ideas.*

Furthermore, while there was some hesitation regarding the rate increase, only one participant felt it to be unreasonable and opposes it.

> *If Milton Hydro wants to put their 15% up by $8.30, and if everyone wants to do that that means the overall bill is going to go up by just over $60.*

> *Well it just seems like it all goes to the government. Hydro, they publish something like this and you know the rate has to go up, so they're just justifying for the rate to go up. Sometimes it's a bit of smoke and mirrors as to why the rates are actually going up.*

The majority of participants admit to disliking the idea of an increase, however acknowledge that it is both necessary and reasonable and therefore accept it.

> *Well at some point in time you've got to upgrade it. You can do it now, or you can do it later.*

> *As long as it's reasonable. A reasonable increase would be if you look at our inflation rate. That would help us to understand. I think 1% is fair, that would be my ideal.*

Out of Scope Comments

The structure of the consultation is designed to allow for an open platform for discussion. As such, occasionally the discussion veers away from the intended topics. These discussions are often indicative of issues that are important to customers, yet not captured in the scope of the consultation. This group spent some time discussing alternative sources of energy and energy efficiencies.

> *They've got some pulp mills that are using their capacity to sell power as well. There's the ethanol plants near Chatham that are doing that as well. And the cement plant that's using their extra heat to sell power too.*

> *We do something similar at work. There's some heat that comes out so we vented it around so it goes back into the factory for the guys. It's something small, it's internal, but it works.*

Residential Rate Class

The Residential rate class session began the same way as the General Service session. That is, participants were first introduced to the format and purpose of the consultation. The facilitator explained what the consultation is about, why Milton Hydro is holding such a consultation and why customer feedback is important. Discussion initially focused on the provincial electrical system and then narrowed down to a discussion about Milton Hydro's role within that system.

Initially, none of the participants were aware that only 18% of their bill is allocated to Milton Hydro. However, following the introduction, all Residential participants felt that they understood *somewhat well* the parts of the electricity system, how they work together and which services Milton Hydro is responsible for.

General Satisfaction

Initially, participants were asked to rate their overall satisfaction with the service they receive from Milton Hydro. While anecdotal concerns arose throughout the consultation, only two participants indicated dissatisfaction in the workbook (*somewhat satisfied*: 6; *somewhat dissatisfied*: 2).

Improving Service of the Local Distribution System

When asked how service could be improved, participants were focused on communication. What they felt to be lacking was real-time information regarding their consumption. Many participants say they are energy conscious, and do what they can to conserve, but the way the system is currently set up makes it hard for them to understand the impact this has on their bill. Several participants suggested an app that would allow them to more closely monitor their usage, and help them plan for the cost of their bills ahead of time.

> *The biggest thing for me is the constant surprise. I just thought if the technology is available then they can tell me via an app how much I'm consuming every so often, so at the end of my month I know what my bill is going to be and it's less of a surprise.*
>
> *Changing your behaviour is obvious. Just like your phone or internet. They provide real-time information. So if I know that I'm going to be over my allotted limit and they're going to charge an additional cost per GB or per minute or a data plan, I'm going to change my behaviour. But I would personally like to have something online that tells me what my consumption is; where it is truly being affected.*
>
> *I think what we we're saying about bills and the app is just real-time information. The bar graph showing what you spent this month compared to last year at this time, it's kind of irritating information. I don't care what I spent last year; I know I'm spending more this year. So you don't really need to compare.*

Ice Storm of 2013

The ice storm of 2013 impacted participants with a varying degree of severity. Two participants were not affected at all, while the longest loss of service lasted for seven days and seven nights.

> *I remember that time; I never had any power outages.*
>
> *Ours was actually off for a very short amount of time.*

Whether they were affected or not, participants were generally quite satisfied with Milton Hydro's response to the storm; only one participant indicated dissatisfaction in the workbook. One participant acknowledged the storm's resulting silver lining – its impact on vegetation management.

> *Milton Hydro did one good thing after the winter storm. On my street they had tree cutting people for weeks and months, so now if we come across the same storm, the trees aren't going to be on the hydro wires. So they spent a whole pile of money and to me I think that's great.*

Communication during the storm was the central issue that many participants feel could be improved upon. Particularly in an event such as the ice storm, that leaves people without power for an extended period of time, any and all information is very valuable. One participant mentioned the use of social media, and implied that Milton Hydro could have had a stronger presence.

I feel that people were not notified when they can get their power back, so they can go to another place and then come back to their place. They should have that luxury of knowing when power would be coming back to their home.

You need to have some sort of communication as to how long it's going to take so that you can make some form of provisions because another hour everyone can probably last, but another two days you're going to start thinking, "Do I need to go to a hotel, to a relative, to call in work".

It felt really good people were themselves posting on the social media, "People who don't have electricity come down to my home". If people can do that, Milton Hydro can probably do a lot more than that.

One participant suggested a subscription based mobile phone service that customers may benefit from in the event of an outage.

With the information age that we're in and with almost everyone paying online, it could be a subscription that you can opt in or opt out of. They [Milton Hydro] can notify everybody by text in the affected area. You provide your cell phone number. If you [Milton Hydro] can call about the bill, you [Milton Hydro] can call to say, "You know what, sorry but power's going to be out for the next seven days".

System Reliability

The majority of participants experienced very few outages in the year prior; only two indicated that they were without power more than twice. Unlike General Service participants, power quality was not an issue that was discussed at any length. One participant made a comparison with another service area and expressed appreciation for the reliability provided by Milton Hydro.

On the average year, I'm without power 10 to 12 times.

The reliability is pretty good. I know [participant], you had your negative share of experiences. But the numbers would dictate that for the most of us, we're pretty fortunate for the number of outages.

Overall our power never goes out. We've been in the same house for 10 years and the power's flickered a couple times. When everyone has a power outage it's different but we don't ever lose power. Our friends in Acton are without power all the time. So we're happy because we know we're going to cook dinner and have a regular life. We've never really lost power.

Furthermore, almost every participant indicated that the number of outages they experienced in the year prior was at least *somewhat reasonable.* Half of the participants agreed that two outages a year is reasonable (*one*: 2; *two*: 4; *three*: 1; *missing value*: 1).

Impact of Outages

Residential participants are much less severely impacted by outages than General Service participants. Only one found the most recent outage they experienced to be more than *a minor inconvenience*. Furthermore, almost every participant was at least *somewhat satisfied* with Milton Hydro's management of that outage. Once again, communication is the most important factor in the event of an outage. It was felt that communication is especially required in the event of an outage lasting longer than two hours, and should be followed up with an expectation of how long the power will be out.

I'm noticing that if there's a power outage for under two hours, I don't really consider it a big deal. It's almost like my kids are cheering, "Okay, let's eat all the ice cream". But it's on within two hours. It's not really a big deal, it's almost like a pleasant interruption.

Well, my eight and nine year olds, when the power went out said "Oh, it's like the pioneer times". We live in a very luxurious first world experience and yes we pay for it and everything else but I mean if it goes out for an hour you have to figure out something else to do. Yes, you may have wanted to cook dinner or you may have been on the computer but it's not going to kill you if the power goes out for an hour once in a while.

Anything more than 2 hours in my opinion requires some form of communication, you know "We're working on it and this is what we're anticipating to be".

In the workbook, participants indicated that outages lasting longer than two hours may become more serious when there are vulnerable persons (children, the elderly, the ill) involved. Food spoilage and loss of heat during the winter months were also of concern for some.

As per question 15: is there a length of time at which the cost and consequences of an outage become more serious, well yeah. If the kids were sick, if the kids were infants, if there were elderly residents, if it was in the middle of some work related activity you were doing and had to get it done, computer usage or something that you had a deadline. Of course even two hours can become all of a sudden a major inconvenience.

Participants were asked whether they would prefer to have more frequent but shorter outages, or longer, infrequent outages. While some would prefer shorter outages, the group was mostly ambivalent. With adequate communication, outages are seen to be of little consequence.

I think shorter because if you had a power outage every day and it was 15 minutes, versus a full day then that's different. But I don't work at home on the computer.

As long as there's an expectation of how long it's going to be, I think the number doesn't really matter to me.

Customer Experience and Expectation

In line with findings from the General Service group, some participants have experienced difficulty interacting with Milton Hydro should an issue arise. Such issues are most often in regard to billing, and it was indicated in the workbook that a longer grace period would be appreciated before being contacted by Milton Hydro in regards to a late payment. When Milton Hydro did reach out, it was found to be difficult to progress beyond the automated phone system.

Sometimes when they call you'll get the automated thing; you try to call in person and you get an answering machine they won't call you back for two or three days. It's kind of annoying; you just want to talk to someone.

One participant was concerned about the lack of impact significantly reduced electricity usage has on their bill.

I kind of look at which month we are away from our home. I look at the bill and am kind of hoping for a notable disparity, you know discrepancy, but I don't see that. It might be little but – if I was gone for two weeks then potentially you might think that your bill should be not half, but still notably less. But surprisingly I did not see that.

Capital Investment

Participants recognize the importance of investing in replacing aging infrastructure and modernizing the grid. Only one participant felt that investing now in modernizing the grid is less than *somewhat important*.

> *You can't compromise; if they are old you have to replace them.*

> *I mean just as everything's changing with technology, the power generation also needs to change. I mean unless you invest in something that's faulty.*

That said, there was some emphasis that Milton Hydro needs to be wise in structuring the schedule of investment, in addition to ensuring the new equipment will have a lifespan that outweighs the cost.

> *I say spread it out so that it's not sharp changes. So if you're replacing a certain amount each year, like it says here a few dollars is a few dollars. If it's spread out over time then everyone should expect that we are going to pay management to replace older things, but if that's planned out properly it shouldn't be a spike in either direction.*

Only one participant felt that Milton Hydro should *lower its investment in renewing the aging infrastructure*. They found that the system already performs at a high standard and questioned the value of upgrading it.

> *I would say the reliability is high. So when the reliability is high, we probably don't need to come up with further investments, because the improvement you're going to get is going to be very marginal.*

Participants were unanimous in their opposition of the run-to-failure approach; not a single participant was in favour of waiting until equipment breaks down before replacing it.

> *I would rather not [wait until equipment breaks down]. Just because I don't have the visibility and confidence that the savings will be translated to us, so I would much rather just say fine invest it in the equipment.*

Conservation and Demand Management

Participants were divided in their views of CDM programs. While the majority are at least *somewhat likely* to participate in these programs, those that were opposed strongly voiced their hesitation. These participants were quite uncomfortable with the idea of relinquishing control over what happens in their own homes.

> *I would rather pay the few dollars to have things replaced rather than a switch that can turn off your water heater or air conditioner for short times during peak demand. I'm not in favour of that at all. That one's scary.*

> *I feel like we're an environmentally friendly family and we aren't abusive towards the system, we turn our air conditioning up so it's not as cold and we watch those peak times and things like that. So I feel like if I need it on that night because I'm not feeling well or something I don't want to have it shut off.*

> *This is also a privacy issue, this is also control of appliances that I'm using, I'm paying for, that are in my own home, to all of a sudden allow external use of a device by to some degree a government controlled agency does not sit well with me.*

Proposed Plan and Rate Impact

While participants varied in how well they understand the cost drivers Milton Hydro is responding to (*quite well*: 4; *not very well*: 3; *don't know*: 1), all participants feel that Milton Hydro is planning *somewhat well* for the future. There is also a consensus that the impact of the proposed rate increase will be marginal. Although the majority of participants does not like to see an increase, they ultimately acknowledge that to continue being provided with the level of service they are accustomed to, a rate increase is necessary.

> *I can live with this increase; it's not going to kill me.*
>
> *I think that just like everything, commodities, utilities, everything's going up and things need to be replaced. Reliability is pretty good, so I feel like, yeah I don't want to spend extra money but I mean, four dollars to me doesn't seem like a lot. Because it's only 18%, the rest is out of our control.*
>
> *My monthly bill is never the same, so it's pretty hard for me to say. It's almost impossible to say it cost me $5 more, because you know you go from $160 to $200. I'm not going to cry about $5; I'll cry about $50.*

How Could the Consultation Process be Improved?

Overall, participants found the consultation to be very informative and a valuable use of time. Many had only a very basic understanding of how Ontario's energy system worked, and the consultation provided them a much appreciated insight into a system they interact with every day. There was also appreciation for Milton Hydro's effort to educate its customers, and that they were given a platform to provide feedback. Further education was encouraged and an online survey was mentioned as a further means of connecting with customers.

> *I don't know if they have done this in the past, or what their obligation to do this is, but I think if there was some kind of forum where people can come to learn then maybe people wouldn't be so heated. I didn't understand a lot of this until tonight, I just pay the bill and it seems like a lot but now that I see some of the things it's a little bit easier to digest and I'm wondering if this could help them in their customer service approach and I don't know how, visual ads, forums. Knowledge is power. The more you understand the more in control you feel.*

Questionnaire Results (Workbook)

The following tables are the tabulations of participant feedback to questions in the workbooks, which were returned at the end of each consultation session.

Note: “GS” = general service less than 50 kW customers, while “RS” = residential customers.

1. Before this consultation, how well do you feel you understood the parts of Ontario's electricity system?

Response	GS	RS	TOTAL
Very well	4	1	5
Somewhat well	3	2	5
Not very well	0	5	5
I don’t understand at all	0	0	0
TOTAL	7	8	15

2. Generally, how satisfied are you with the service you receive from Milton Hydro?

Response	GS	RS	TOTAL
Very Satisfied	1	0	1
Somewhat satisfied	4	6	10
Somewhat dissatisfied	2	2	4
Very dissatisfied	0	0	0
Don't know	0	0	0
Missing Value	0	0	0
TOTAL	7	8	15

4. How well do you feel you understand the important parts of the electricity system, how they work together, and which services Milton Hydro is responsible for?

Response	GS	RS	TOTAL
Very well	2	0	2
Somewhat well	5	8	13
Not very well	0	0	0
I don’t understand at all	0	0	0
TOTAL	7	8	15

5. The ice storm in December 2013 was an unusual and extreme weather event. Were you/ was your organization affected by electrical outages in Milton as a result of the ice storm?

Response	GS	RS	TOTAL
Yes	4	6	10
No	3	2	5
TOTAL	7	8	15

6. Whether you/your organization was affected or not, how satisfied were you with the performance of Milton Hydro's line crews during the ice storm?

Response	GS	RS	TOTAL
Very satisfied	4	2	6
Somewhat satisfied	3	4	7
Somewhat dissatisfied	0	0	0
Very dissatisfied	0	1	1
Don’t know	0	1	1
TOTAL	7	8	15

7. And again, whether you/your organization was affected or not, how satisfied were you with Milton Hydro's communication during the storm?

Response	GS	RS	TOTAL
Very satisfied	1	1	2
Somewhat satisfied	3	2	5
Somewhat dissatisfied	1	2	3
Very dissatisfied	0	1	1
Don’t know	2	2	4
TOTAL	7	8	15

9. The average Milton Hydro customer experiences about 1 power outage per year. Do you recall how many outages you/your organization experienced in the past 12 months?

Response	GS	RS	TOTAL
None	2	1	3
One	0	1	1
Two	0	4	4
Three	1	0	1
More than three	4	2	6
Don’t know	0	0	0
TOTAL	7	8	15

10. Aside from the ice storm, thinking back to the most recent power outage you/your organization experienced as a Milton Hydro customer, would you say the power outage…

Response	GS	RS	TOTAL
Was a major inconvenience	2	1	3
Was a minor inconvenience	3	4	7
Was no inconvenience at all	0	1	1
Have not had any power outages	1	1	2
Don't know	1	1	2
Missing value	0	0	0
TOTAL	7	8	15

11. How satisfied were you with Milton Hydro's management of the most recent power outage you experienced?

Response	GS	RS	TOTAL
Very satisfied	1	1	2
Somewhat satisfied	4	6	10
Somewhat dissatisfied	0	0	0
Very dissatisfied	1	0	1
Don’t know	0	1	1
Missing value	1	0	1
TOTAL	7	8	15

12. How reasonable were the number of power outages you/your organization experienced over the last 12 months?

Response	GS	RS	TOTAL
Very reasonable	1	4	5
Somewhat reasonable	4	1	5
Not very reasonable	1	1	2
Not reasonable at all	1	0	1
Did not have any power outages	0	1	1
Don’t know	0	0	0
Missing value	0	1	1
TOTAL	7	8	15

13. How many power outages do you feel are reasonable in a year?

Response	GS	RS	TOTAL
No outage is reasonable	4	0	4
One	2	2	4
Two	1	4	5
Three	0	1	1
Four	0	0	0
More than four	0	0	0
Missing value	0	1	1
TOTAL	7	8	15

14. What do you feel is a reasonable duration for a power outage?

Response	GS	RS	TOTAL
No outage is reasonable	1	0	1
30 minutes	3	2	5
1 hour	1	4	5
2 hours	1	1	2
3 hours	1	0	1
4 hours or more	0	0	0
Missing value	0	1	1
TOTAL	7	8	15

16. With regards to projects focused on replacing aging equipment in poor condition, which of the following statements best represents your point of view?

Response	GS	RS	TOTAL
Milton Hydro should invest what it takes to replace the system's aging infrastructure to maintain system reliability, even if that increases my monthly electricity bill by a few dollars over the next few years.	4	4	8
Milton Hydro should lower its investment in renewing the system's aging infrastructure to lessen the impact of any bill increase, even if that means more or longer power outages.	0	1	1
Don't know	2	2	4
Missing value	1	1	2
TOTAL	7	8	15

17. Thinking about the aging equipment in the grid, do you feel it's best to wait until the equipment breaks down to get full value from each piece of equipment, even if it means power outages, or do you feel the best approach is to replace the equipment before it breaks down to avoid power outages, even if it means not getting all the use possible from each piece of equipment?

Response	GS	RS	TOTAL
Wait until break down	0	0	0
Replace before break down	6	7	13
Don't know	1	1	2
TOTAL	7	8	15

18. Given there are many other areas of needed investment, such as connecting new customers, replacing aging equipment and expanding capacity for long-term growth, how important do you feel it is for Milton Hydro to invest now in modernizing the grid?

Response	GS	RS	TOTAL
Very important	4	1	5
Somewhat important	1	5	6
Not very important	0	1	1
Not important at all	0	0	0
Don't know	2	0	2
Missing value	0	1	1
TOTAL	7	8	15

19. How well do you feel you understand the cost drivers that Milton Hydro is responding to?

Response	GS	RS	TOTAL
Very well	2	0	2
Quite well	2	4	6
Not very well	1	3	4
Not well at all	0	0	0
Don't know	1	1	2
Missing value	1	0	1
TOTAL	7	8	15

20. In order for conservation and demand management (CDM) programs to slow the pace of system renewal and expansion, they must lower the electricity consumption at peak demand.
RS: How likely is it that you would participate in CDM programs that would allow electricity system managers to turn off equipment you are using? For residential customers, this would involve automated devices to turn off your water heater and air conditioner for short periods during times of peak demand.
GS: How likely is it that your organization would participate in CDM programs that subsidize your investments in building energy efficiency improvements?

Response	GS	RS	TOTAL
Very likely	2	2	4
Somewhat likely	2	3	5
Not very likely	0	0	0
Not at all likely	1	3	4
Don’t know	0	0	0
Missing value	2	0	2
TOTAL	7	8	15

21. How did Milton Hydro's plan cover the topics you expected?

Response	GS	RS	TOTAL
Very well	2	3	5
Somewhat well	3	5	8
Not very well	0	0	0
Not well at all	0	0	0
Missing value	2	0	2
TOTAL	7	8	15

22. How well do you think Milton Hydro is planning for the future?

Response	GS	RS	TOTAL
Very well	2	0	2
Somewhat well	2	8	10
Not very well	1	0	1
Not well at all	0	0	0
Don’t know	1	0	1
Missing value	1	0	1
TOTAL	7	8	15

23. Considering what you know about the local distribution system, which of the following best represents your point of view?

Response	GS	RS	TOTAL
The rate increase is reasonable and I support it	0	1	1
I don't like it, but I think the rate increase is necessary	4	5	9
The rate increase is unreasonable and I oppose it	1	1	2
I don't know	0	0	0
Missing value	2	1	3
TOTAL	7	8	15

Mid-Market GS > 50kW Survey

Presentation and Survey
with General Service (GS) >50 kW customers

PURPOSE: To gain qualitative input on Distribution System investment plans and rate impact for Milton Hydro from GS > 50 kW customers

The following summary highlights key findings from the mid-market (General Service > 50 kW) survey conducted at a Milton Hydro-hosted breakfast session held in Milton on Wednesday, June 17th, 2015.

Summary

General Satisfaction

At the conclusion of the presentation by Milton Hydro, almost all felt they understood the system and Milton Hydro's role therein at least *somewhat well.* Furthermore, the large majority are *very satisfied* with the service they receive. Suggested improvements focused on communication in the event of an outage; yet those who follow Milton Hydro on social media find Twitter to be very useful in attaining desired information.

System Reliability

Participants experienced outages of varying frequencies – from none to more than four – in the year prior. Regardless, all participants save one felt the number of outages they experienced to be reasonable. Furthermore, most were quite satisfied with Milton Hydro's response to the most recent outage they experienced. Outages impact these organizations most severely when interruptions to power and power quality causes significant losses in productivity.

Capital Expenditure

In regards to investing in the system, reducing the duration of outages is felt to be more important than reducing the frequency of outages. While the group was somewhat divided on this, all participants agreed that it is very important to invest now in modernizing the grid. They also agreed that equipment should be replaced before it breaks down, as opposed to running it to failure.

Milton Hydro's Plan

All participants felt that the plan covered the topics they expected at least *somewhat well*, and the majority felt they understood the cost drivers Milton Hydro is responding to *quite well*. Furthermore, participants are in agreement that the plan is going in the right direction.

Proposed Rate Increase

Despite some hesitation, social acceptance of the proposed rate increase is very high; only one participant is in opposition. Three participants support the increase outright, stating the increase is reasonable and will not impact their business. Those who are reluctant understand the necessity but will be more impacted by the increase, as they cannot pass the cost onto their customers. Others worry that continued increases hurt big business' ability to remain competitive in Ontario, and fear that they will move elsewhere – taking with them valuable jobs and impacting local communities.

How Could the Consultation be Improved?

Overall, participants found the structure of the consultation to be very effective. They found it informative, educational and appreciated the involvement Milton Hydro made in connecting with them. Suggested improvements focused on the inclusion of more information regarding future technologies and cost saving programs or initiatives. They also continue to promote the importance of communication during outages.

Methodology

About the Mid-Market GS>50 kW Workshop Consultation

In this phase of the customer consultation research program for Milton Hydro, Innovative Research (INNOVATIVE) provided Milton Hydro with a survey to be distributed (by Milton Hydro) following a presentation of their investment plans and resulting rate impacts for 2016 to 2020. The presentation was delivered by senior Milton Hydro staff.

This breakfast session was held in Milton on June 17th, 2015. A total of 14 mid-market general service customers participated in this consultation session.

Recruiting Consultation Participants

Milton Hydro recruited their mid-market general service >50 kW customers to take part in the workshop via an email invitation.

The Survey

The survey was designed to garner feedback from participants on their current and past experiences with Milton Hydro, and their reaction to their proposed investment plans. Following the presentation, the survey was distributed by Milton Hydro staff, and then collected by Milton Hydro staff upon completion. Milton Hydro opted out of having a representative of INNOVATIVE attend to facilitate the survey distribution and collection.

All completed surveys were then sent to INNOVATIVE for tabulation and reporting.

NOTE: Results contained within this report are based on a limited sample and should be interpreted as directional only.

Participant Feedback

The following participant feedback was gathered from the survey results on June 17th, 2015 with mid-market general service customers. These results include both closed and open-ended questions, where participants were able to further explain their responses.

General Satisfaction

Following the information session participants were asked to rate their understanding of the electricity system, its parts and how they work together, in addition to Milton Hydro's role within the system. One participant felt they did not understand the system very well, while another understood some parts but not others; but most participants felt they understood it at least *somewhat well* (*very well*: 3; *somewhat well*: 9).

Overall, participants feel very positively about the service provided to them by Milton Hydro. The large majority are *very satisfied*, with only one indicating dissatisfaction (*very satisfied*: 10; *somewhat satisfied*: 3; *not very satisfied*: 1).

When asked how Milton Hydro could improve service, the central focus was on outages. A number of participants felt that Milton Hydro could improve communication, particularly during scheduled outages. That said, one participant found that Milton Hydro's presence on social media remedied this problem. This participant indicated that they retweet Milton Hydro's posts and appreciate the information they are able to access via Twitter. Another participant indicated the billing process needs improvement, but did not specify further.

System Reliability

The number of outages experienced by mid-market customers is quite varied. Four of the 14 participants experienced two outages in the year prior; four participants experienced less than two; five participants experienced four or more; and one participant was unsure how many outages their organization experienced. Regardless of the frequency, almost every participant found the number of outages they experienced to be reasonable (*very reasonable:* 6; *somewhat reasonable*: 7; *not very reasonable*: 1). For three of these participants, outages have a *significant cost* to their organization – one indicated this stems from a loss in productivity; the remaining participants suffer *minor* to *barely any* cost.

Only two participants indicated dissatisfaction with Milton Hydro's response to the most recent outage they experienced. When asked how this response could have been improved, suggestions were once again centred on communication. Participants want to know when outages are scheduled – and if they're not, when they can expect power to return. Social media was mentioned as an effective means of disseminating such information.

Capital Expenditure

Regarding capital expenditure devoted to managing outages, participants feel that the duration of outages is of more concern than frequency. In line with the sentiments discussed in the previous section regarding reliability, participants do not feel it is a priority to invest in reducing the *number* of outages. Half of participants feel that Milton Hydro should only invest what is needed to maintain the number of outages they already experience, while four would like to see that number reduced. These numbers are reversed when it comes to *duration*, with half of the participants in favour of investing to reduce the length of time they are without power, as opposed to simply spending what is necessary to maintain the current duration of unexpected outages.

All participants agree however, on the importance of investing now in modernizing the grid (*very important*: 11; *somewhat important*: 3). Furthermore, there is almost unanimous support that the run-to-failure approach is an undesirable practice; all participants, save two, feel that equipment should be replaced before it breaks down.

Milton Hydro's Plan

After being presented the information, the majority (8 of 14) felt that they understood Milton Hydro's cost drivers *quite well*, however the remaining participants are less inclined to this sentiment. In spite of this, all participants are confident that Milton Hydro's plan is going in the right direction (*definitely*: 4; *might be*: 9).

In terms of content, all participants felt that the plan covered the topics they expected at least *somewhat well* (*very well*: 3; *somewhat well*: 10; *missing value*: 1). When asked what information is still missing one participant questioned how future technologies would be integrated into households, and what impact this may have on Milton Hydro's plan. Another felt that an additional session could be devoted to energy saving programs and products.

Proposed Rate Increase

Overall, social acceptance of the proposed rate increase is quite high. While the majority do not like the idea of an increase, they understand that it is necessary. Three participants support the increase outright. For them, maintaining reliability is of the utmost importance, and the increase is seen to be "negligible" and "in line with other increases".

Ten of 14 participants reluctantly accept the increase for various reasons. Some who see the increase as necessary are hesitant because they cannot mitigate the increase by passing it along to their own customers. Others feel that increasing rates, coupled with Ontario's already comparatively high cost of electricity, is a deterrent to attracting and keeping manufacturers that create jobs, and foster the growth of communities. Some participants are concerned that big businesses will be forced to move elsewhere in order to remain competitive.

One participant felt that the rate increase is rooted in factors unrelated to energy services "(i.e. financing, etc.)" and was therefore opposed to the increase.

How Could the Consultation be Improved?

The final portion of the survey asked for feedback on the consultation process itself. Participants were asked for their impression of the consultation, the content that was covered, and were given an opportunity to provide suggestions for future consultations.

Overall, participants had a very positive impression of the consultation. They found it to be well presented and very informative. They also found the amount of information to be just right given the timeframe and structure of the exercise.

When asked if participants felt there were gaps in the content they would have like to have seen covered, the responses were much the same as reported in earlier sections. More information on future technology and conservations was most frequently cited; further details regarding outage statistics and upcoming planned outages was also of concern.

In regard to future consultations, many participants found this format to be effective and felt it should be repeated, while several suggested one-on-one consultations. As a final thought, participants acknowledge gratitude for the invitation to the event and encourage Milton Hydro to "be the best in Canada".

Questionnaire Results

1. Given what you know and what you have learned this morning, how well do you feel you understand the parts of the electricity system, how they work together and which services Milton Hydro is responsible for?

RESPONSE	TOTAL
Very well	3
Somewhat well	9
Not very well	1
There are parts I understand, but other parts I am unsure of	1
I don't understand at all	0
TOTAL	14

2. Generally, how satisfied are you with the service you receive from Milton Hydro?

RESPONSE	TOTAL
Very Satisfied	7
Somewhat satisfied	4
Somewhat dissatisfied	0
Very dissatisfied	0
Don't know	1
TOTAL	14

4. Aside from power outages caused by major weather events (e.g. December 2013 ice storm), approximately how many unexpected outages did your organization experience over the past 12 months?

RESPONSE	TOTAL
None	1
One	3
Two	4
Three	0
Four	2
More than four	3
Don't know	1
TOTAL	14

5. No distribution system can deliver perfectly reliable electricity. There is a balancing act between reliability and the cost of running the system. With this in mind, how reasonable were the number of power outages your organization experienced over the past 12 months?

RESPONSE	TOTAL
Very reasonable	6
Somewhat reasonable	7
Not very reasonable	1
Not reasonable at all	0
Did not have any power outages	0
Don't know	0
TOTAL	14

6. Thinking back to the most recent power outage that your organization experienced as a Milton Hydro customer, would you say the power outage …

RESPONSE	TOTAL
Had a significant cost to your organization	3
Had a minor cost to your organization	9
Had barely any cost to your organization, just a bit of inconvenience	2
Don't recall ever experiencing a power outage as a Milton Hydro customer	0
Don't know	0
TOTAL	14

7. How satisfied were you with Milton Hydro's response to the most recent power outage your organization experienced?

RESPONSE	TOTAL
Very satisfied	6
Somewhat satisfied	3
Somewhat dissatisfied	2
Very dissatisfied	0
Don't know	3
TOTAL	14

9. In your view, how do you think Milton Hydro should address the number of unexpected power outages?

RESPONSE	TOTAL
Spend what is needed to reduce the number of unexpected power outages	4
Spend what is needed to maintain the current level of unexpected outages	7
Accept more unexpected power outages in order to help keep customer costs from rising	1
Don't know	2
TOTAL	14

10. In your view, how do you think Milton Hydro should address the length of time customers are without power?

RESPONSE	TOTAL
Spend what is needed to reduce the duration of unexpected power outages	7
Spend what is needed to maintain the current duration of unexpected outages	5
Accept longer unexpected power outages in order to help keep customer costs from rising	1
TOTAL	14

11. Modernizing the grid can allow Milton Hydro to improve reliability. Investments such as automated switches may allow Milton Hydro to minimize the number of people impacted by outages and to restore electricity to most customers in a matter of seconds. Given there are many other areas of needed investment, such as connecting new customers, replacing aging equipment and expanding capacity for long-term growth, how important do you feel it is for Milton Hydro to invest now in modernizing the grid?

RESPONSE	TOTAL
Very important	11
Somewhat important	3
Not very important	0
Not important at all	0
Don't know	0
TOTAL	14

12. Thinking about the aging equipment in Milton Hydro's distribution system, do you feel it's best to wait until non-critical infrastructure (equipment that impacts a limited number of customers, such as pole top transformers) breaks down to get full value from each piece of equipment, even if it means power outages, or do you feel the best approach is to replace the equipment before it breaks down to avoid power outages, even if it means not getting all the use possible from each piece of equipment?

RESPONSE	TOTAL
Wait until break down	2
Replace before breakdown	12
Don't know	0
TOTAL	14

13. How well do you understand the cost drivers that impact Milton Hydro's operations and that Milton Hydro must respond to?

RESPONSE	TOTAL
Very well	0
Quite well	8
Not very well	5
Not well at all	1
Don't know	0
TOTAL	14

14. From what you have heard this morning and what you may have heard elsewhere, does Milton Hydro's investment plan seem like it is going in the right direction or the wrong direction?

RESPONSE	TOTAL
Definitely the right direction	4
Might be the right direction	9
Might be the wrong direction	0
Definitely the wrong direction	0
Don't know	1
TOTAL	14

15. How well did Milton Hydro's plan cover the topics you expected?

RESPONSE	TOTAL
Very well	3
Somewhat well	10
Not very well	0
Not well at all	0
Don't know	0
Missing value	1
TOTAL	14

16. Considering what you know about the local distribution system, which of the following best represents your point of view?

RESPONSE	TOTAL
The rate increase is reasonable and I support it	3
I don't like it but I think the rate increase is necessary	10
The rate increase is unreasonable and I oppose it	1
Don't know	0
TOTAL	14

Consultation Feedback

Preamble:

Milton Hydro values your feedback. This is the first time the utility has conducted a review about its upcoming investment plan and they would like your input for planning future reviews. Please take a few minutes to answer the following questions.

General Impression: Overall, what did you think of this information session?

- Good session but should differentiate residential/commercial as models are different.
- Excellent, very informative.
- Very good. Could add a couple more presenters and introduce hydro folk.
- OK. Would like to see more effort from hydro to get representation from the many local businesses.
- Very good, open.
- Good.
- Very informative.

- Good, informative. Would have liked more details related to manufacturing/industry in Milton.
- Good, more on "green".
- Very good.
- Good.
- First one I have been to. It was informative but I have no frame of reference to compare it to others.
- Well done!
- Well presented, good insight!

Volume of Information: Did Milton Hydro provide too much information, not enough, or just the right amount?

- Not enough.
- Great.
- Right amount.
- Good info.
- A good amount of info and overview.
- It's good that more info was offered to those that might want it.
- I think it was a good amount.
- Good based on time.
- Right amount.
- It was OK.
- It was the right amount.
- Just the right amount.
- OK.

Content Covered: Was there any content missing that you would have liked to have seen included?

- No financial model data. No regulatory data on financial models.
- Future technology. Upcoming rebate offers.
- Impact of rate increases on local businesses of all sizes, including small independent businesses, medium and large businesses.
- More detail in regard to outage statistics, as mentioned on previous page.

- Maybe another session for energy saving programs for industry and consumer.
- More on conservation programs.
- Comparison of similar city/town of the expenses.
- Future outages that Milton knows about.
- No.
- Not really.

Outstanding Questions: Is there anything that you would still like answered?

- Future rates and billing.
- Detail on the "auto-notification" mentioned. Clarification on how scheduled system outage is communicated.
- Will contact you.
- Specific age and condition of capital for various sectors/sections of Town.
- None.

Suggestions for Future Consultations: How would you prefer to participate in future consultations?

- Both on residential and commercial.
- Same idea is good.
- One on one meetings.
- Perhaps a questionnaire prior to the seminar.
- These sessions are good.
- Information sessions are very good.
- Energy savings, peak shedding, incentives, etc.
- Same as this one.
- Further in person consultations.

Final Thoughts: Do you have any other comments that you would like Milton Hydro to consider as it finalizes its 2016 rate application?

- Thanks for invite
- We must reduce our cost to make Ontario more competitive in North America!
- Follow up with ongoing updates on process and rationale re: rates.
- As a just-in-time auto parts supplier, outages are important. We have generator backup, so our operations can be supported during longer outages. For us, if there is an outage, it is preferred that it is brief (i.e. less than 15 seconds). However, multiple short outages

are disruptive (longer one-time outage is preferred). Also, there was an occurrence of a service disruption after a weekend where no notification was received, but caused a start-up issue on Monday morning. Notification would be helpful.

- Make sure they are the best in Canada.

Online Workbook Survey

Online Workbook
with Volunteered customers

PURPOSE: To inform customers on the details of Milton Hydro's proposed Distribution System Investment Plan for 2016-2020 and obtain feedback on the proposed planning options

Summary

Familiarity, Satisfaction and System Reliability

- There is a limited level of understanding with regard to Ontario's electricity system, with just over half (57%) claiming to be at least somewhat familiar.
- At 88%, customer satisfaction with Milton Hydro is strong. Among those who provided suggested improvements, reduced rates (16%) and improved customer service (9%) top the list of mentions.
- Despite only moderate familiarity with the provincial system overall, 81% say they are at least somewhat familiar with Milton Hydro's role within the system and which services they are responsible for.
- More than half (55%) of respondents were impacted by the ice storm of 2013. Four-in-five (80%) were satisfied with Milton Hydro's line crews performance in response to the storm, but satisfaction with the utility's communication during the storm is significantly lower at 61%.
- Almost half (48%) have experienced the utility's average of one outage per year (25%) or none at all (23%). Most (63%) report that their most recent outage was an inconvenience, but more than half (55%) say it was only a *minor* inconvenience.
- Seven-in-ten (71%) were satisfied with Milton Hydro's management of their most recent outage.
- Almost three quarters (73%) say the number of outages they experienced in the past 12 months is reasonable.

Investment Solutions and Cost Drivers

- A majority (61%) prefer that Milton Hydro invests what is needed to maintain reliability, even if it means an increase to their monthly bill.
- Three quarters (75%) feel that system equipment should be replaced before it breaks down, rather than a run-to-failure approach.
- Almost nine-in-ten (88%) feel that, despite other pressures on the system, it is important to invest now in modernizing the grid.

Budget, Planning and Rate Impact

- Seven-in-ten (70%) feel they have an understanding of the cost drivers that Milton Hydro is responding to.

- A similar proportion (69%) indicate that they would be likely to participate in a CDM program.
- The vast majority (91%) feel that Milton Hydro's investment plan covered the topics they expected, and 87% feel that Milton Hydro is planning well for the future.
- Two-thirds (67%) are prepared to accept the proposed estimated rate increase, either because they support it (14%) or they see the necessity of it (52%).

Methodology

A Background on the Online Workbook

The online workbook was designed by INNOVATIVE in consultation with Milton Hydro in order to both provide information for customers and to gather their feedback related to Milton Hydro's 2016-2020 Distribution System Investment Plan. The workbook contained a total of 28 questions (23 core questions and five feedback questions regarding the survey/workbook itself). Text and graphics were included throughout to provide respondents with background information to help them answer the survey questions.

The workbook was divided into six main sections:

1. "What is this Consultation About?"
2. "Electricity 101"
3. "Milton Hydro's Distribution System Today"
4. "System Reliability"
5. "Cost Pressures"
6. "What the Plan Means for You"

"What is the Consultation About?" outlines the purpose of the customer consultation and the rate application process. It explains that the OEB requires LDCs to collect information regarding customer needs and preferences as part of their long-term planning. A combination of text and graphic elements are used to explain Ontario's electricity system, and to provide a clear breakdown of customers' electricity bills.

The second section, "Electricity 101", explains who does what in Ontario's power system and how the system is regulated. Introductory questions gauge customers' current understanding of the system and their level of satisfaction with the service they receive from Milton Hydro.

In the third section, "Milton Hydro's Distribution System Today", the workbook provides background on Milton Hydro's Distribution System and how the electricity distribution system works. This section includes an overview of asset management. Respondents are asked how well they understand the system and which services Milton Hydro is responsible for.

"System Reliability" provides historical SAIFI and SAIDI information as well as historical causes of outages for the period spanning 2010 to 2014. Customers are asked about their experience with outages, satisfaction with Milton Hydro's response, and their perceptions regarding what is reasonable in terms of the number and duration of power outages.

The fifth section, "Cost Pressures", looks at some of the challenges Milton Hydro is currently facing as they strive to maintain system reliability. Details are provided regarding forecast capital investments between 2016 and 2020, as well as historical capital investment levels dating back to 2011. Operating cost drivers are also examined, along with historical and forecast costs from 2013 through 2017. This section also identifies how Milton Hydro works to find efficiencies and cost savings within the system. Questions address managing aging equipment, modernizing the grid and CDM programs.

In the final section, "What the Plan Means for You", the workbook provides information regarding historical and forecast increases to distribution rates between 2010 and 2020. Estimated increases to monthly bills are provided for the next rate period (2016-2020) so that customers get a sense of how Milton Hydro's Distribution System Investment Plan will impact them directly. Respondents are asked how well the plan covers the topics they expected and how well Milton Hydro is planning for the future. The final question gauges the extent to which customers are prepared to accept the proposed rate increase.

In an appendix, five additional open-ended questions were asked regarding how to improve these consultations moving forward. Topics included customers' overall impression and any additional feedback on the volume of information, content covered, outstanding questions, and suggestions for future consultations.

Field Dates:

The workbook was accessible online for Milton Hydro customers from June 10th to July 1st, 2015.

Promoting the Online Workbook:

Milton Hydro promoted the workbook through a number of methods:

- A link to the survey from the www.miltonhydro.com homepage
- A Twitter message sent out on June 15th, 2015
- Articles in the local *Milton Champion* newspaper – both print and online
- Emails sent to 20,003 customers

Publishing the Workbook Online

INNOVATIVE hosted the workbook at the following url: www.miltonhydrosurvey.com. This website prevented Milton Hydro customers from filling out questions more than once and saved progress as they went, allowing them to return to the workbook to finish at a time of their choosing.

The personal information of Milton Hydro customers was kept anonymous and confidential on our secure business servers.

Validating Customer Responses:

Anyone who answered a question in the workbook was tagged with an identification number based on both their postal code and their response as either a Milton Hydro residential or business customer. This was then validated against a file provided by Milton Hydro of all customer forward sortation area (FSA) codes; those deemed invalid were removed from the final sample. In addition, IP addresses were tracked to ensure respondents were unique and human.

NOTE: Throughout this section of the report, sums (e.g. "very well" + "somewhat well") are added before rounding numbers.

Respondent Profile

Overall, 624 residential and 18 business customers completed the workbook. (Note that open-ended response n-sizes may vary.)

The two charts below outline the demographic breakdown for residential customers (rent vs. own, responsibility for bill, residence type, number in household) and firmographics (work area, monthly spending) for business customers. Due to the small sample size (n=18) of business customers, the following analysis and supporting charts will focus largely on residential customers.

Figure A1: Residential Customer Profile [n=624]

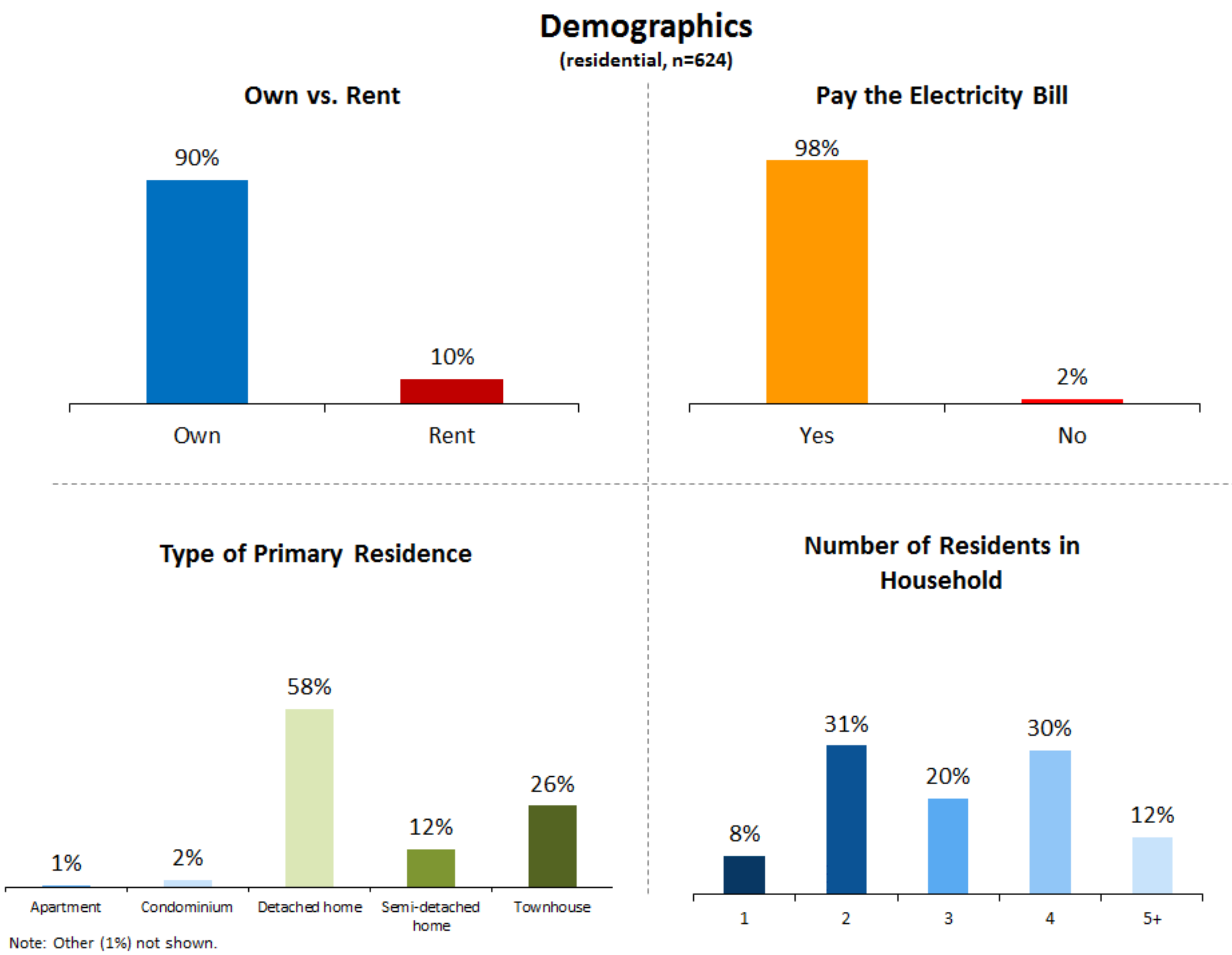
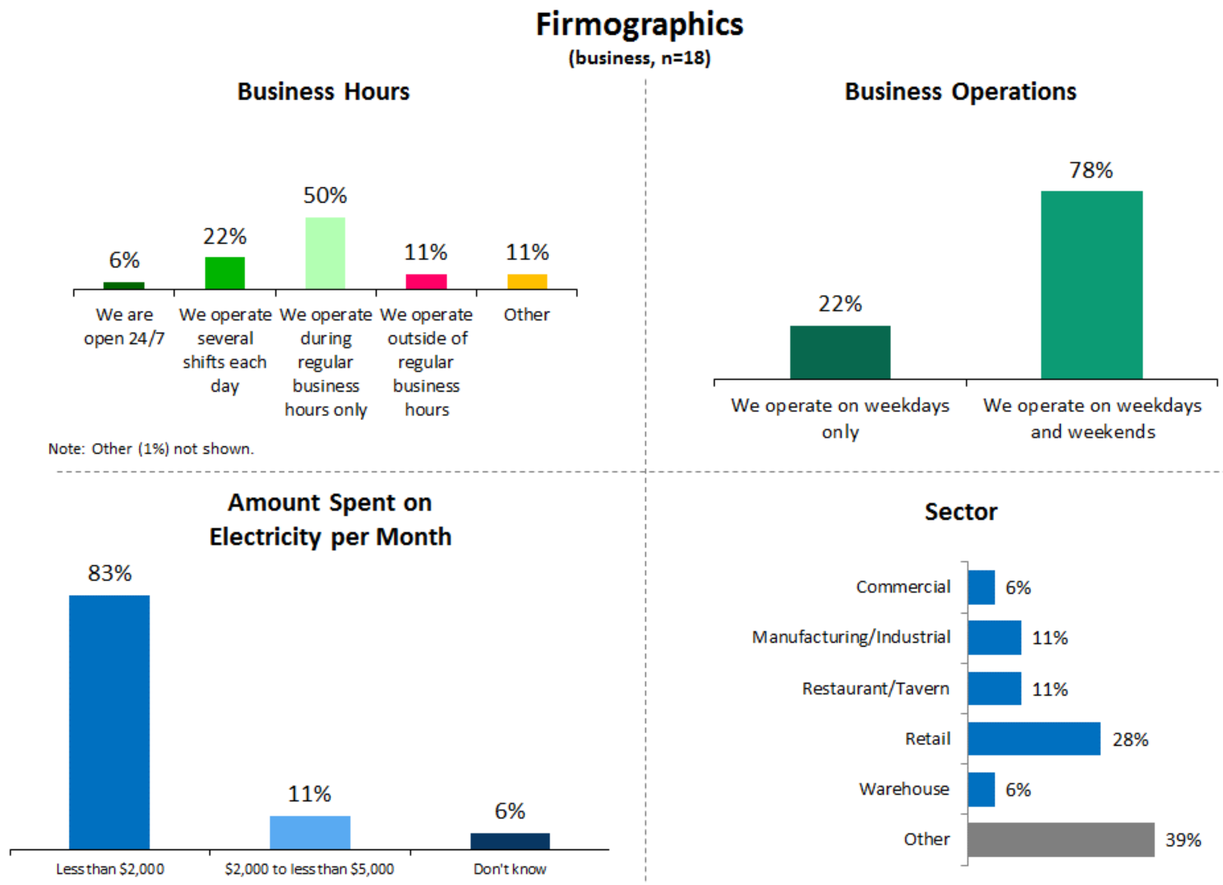


Figure A2: Small Business Customer Profile [n=18]



Respondent Feedback

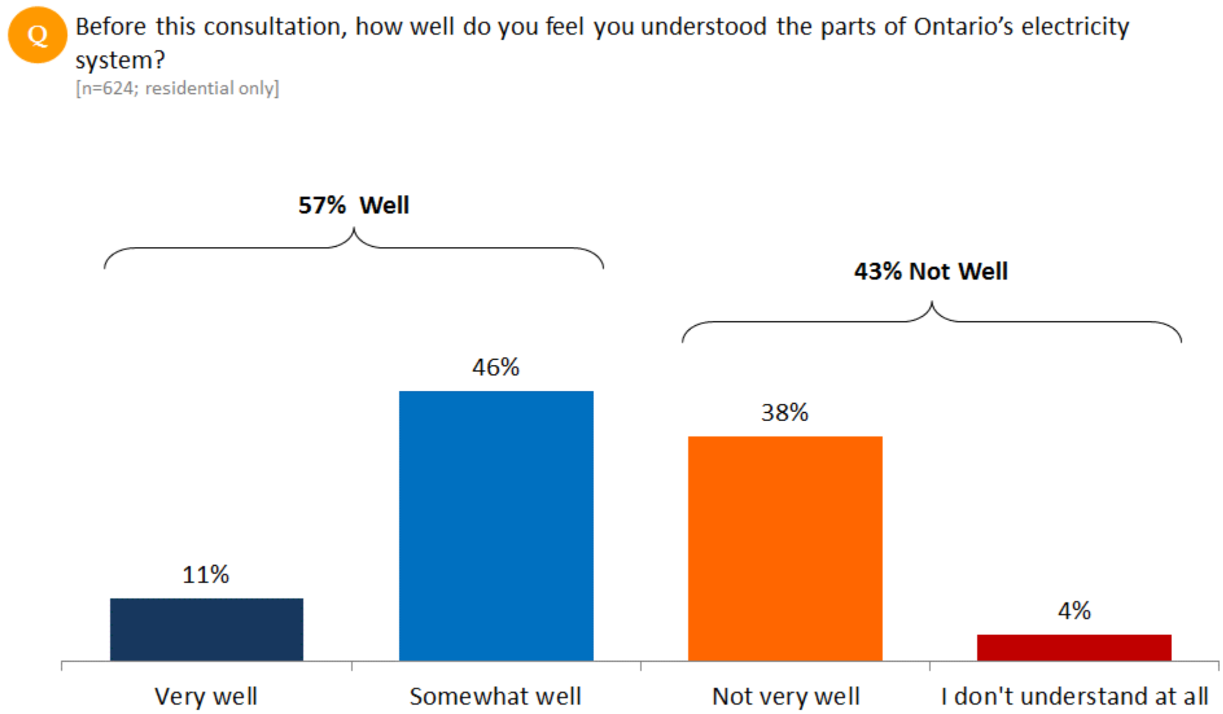
The following sections will outline feedback provided by the 624 residential customers who completed the survey. (Note that since only 18 small business customers completed the survey, their results are reported as n-sizes only in the bottom-left corner of each chart.)

Familiarity, Satisfaction and System Reliability

This first section examines how well residential customers understand Milton Hydro's role in the electricity system, their satisfaction with service and perceptions of system reliability.

At the outset of the workbook survey, respondents were provided with information regarding the provincial electricity system. A majority (57%) of respondents indicate that, prior to this consultation, they understood the parts of the provincial system either *very* (11%) or *somewhat* (46%) well. The remainder report not understanding the system *at all* (4%) or *not very well* (38%).

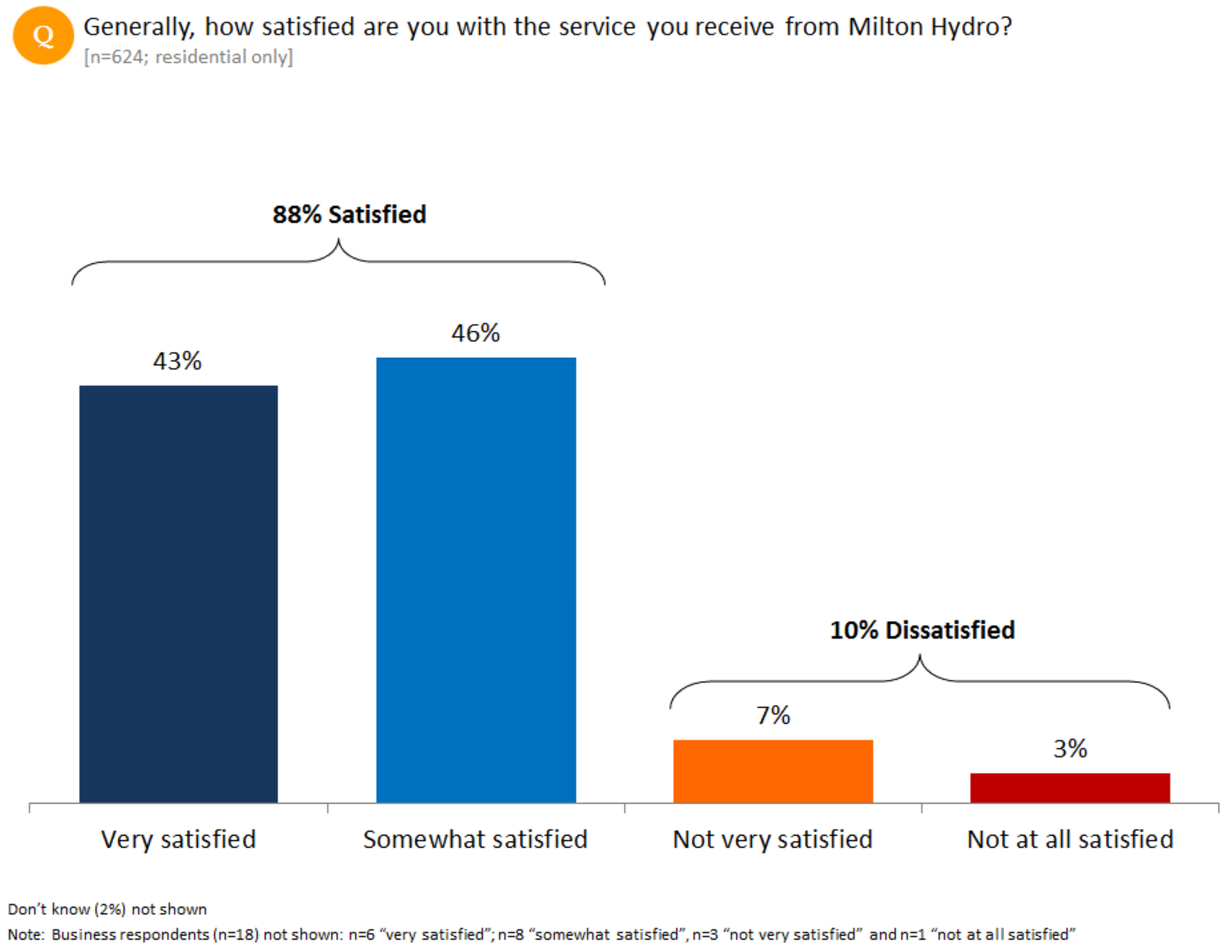
Figure 1: Understanding the Electricity System



Note: Business respondents (n=18) not shown: n=1 "very well", n=12 "somewhat well", n=5 "not very well"

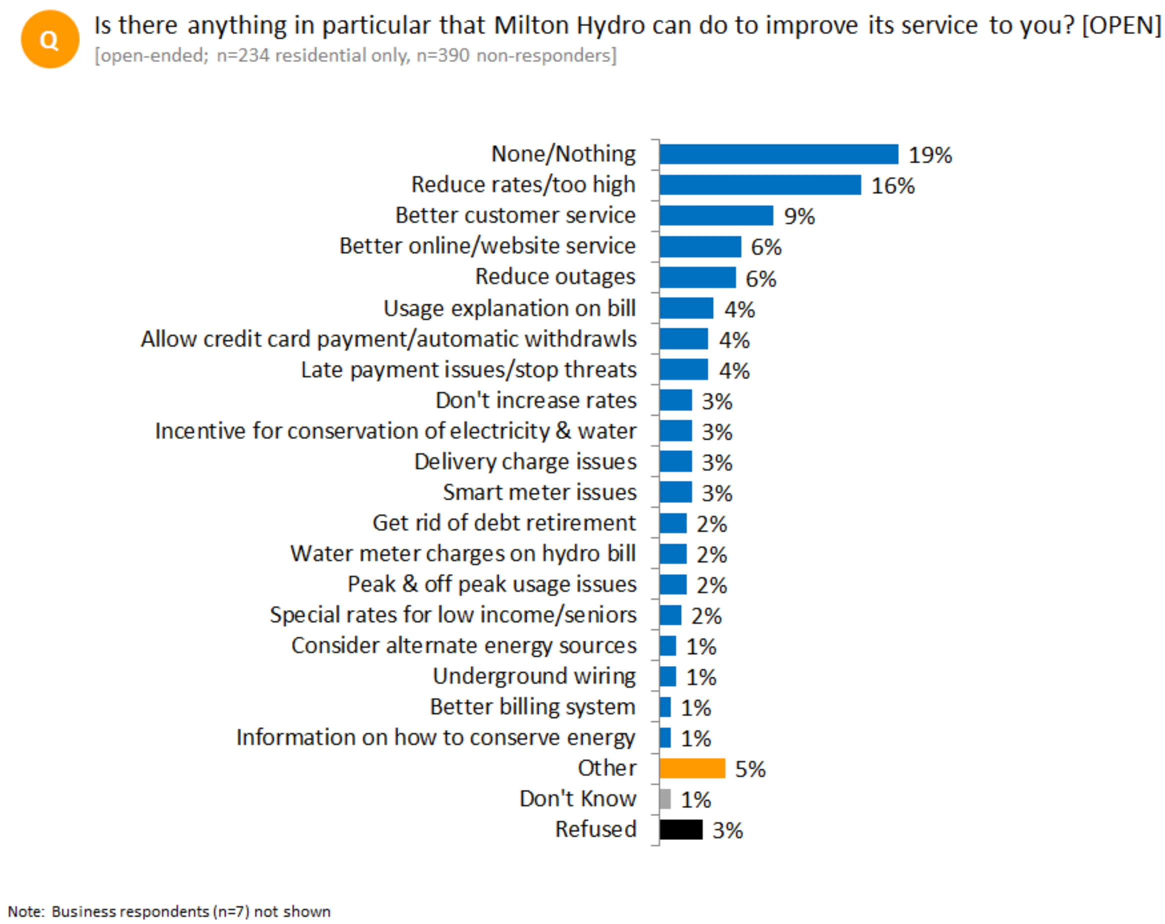
Almost nine-in-ten (88%) of respondents indicate being either *very* (43%) or *somewhat* (46%) satisfied with the service they receive from Milton Hydro. Only one-in-ten are either *somewhat* (7%) or *very* (3%) dissatisfied with their service.

Figure 2: Satisfaction with Service



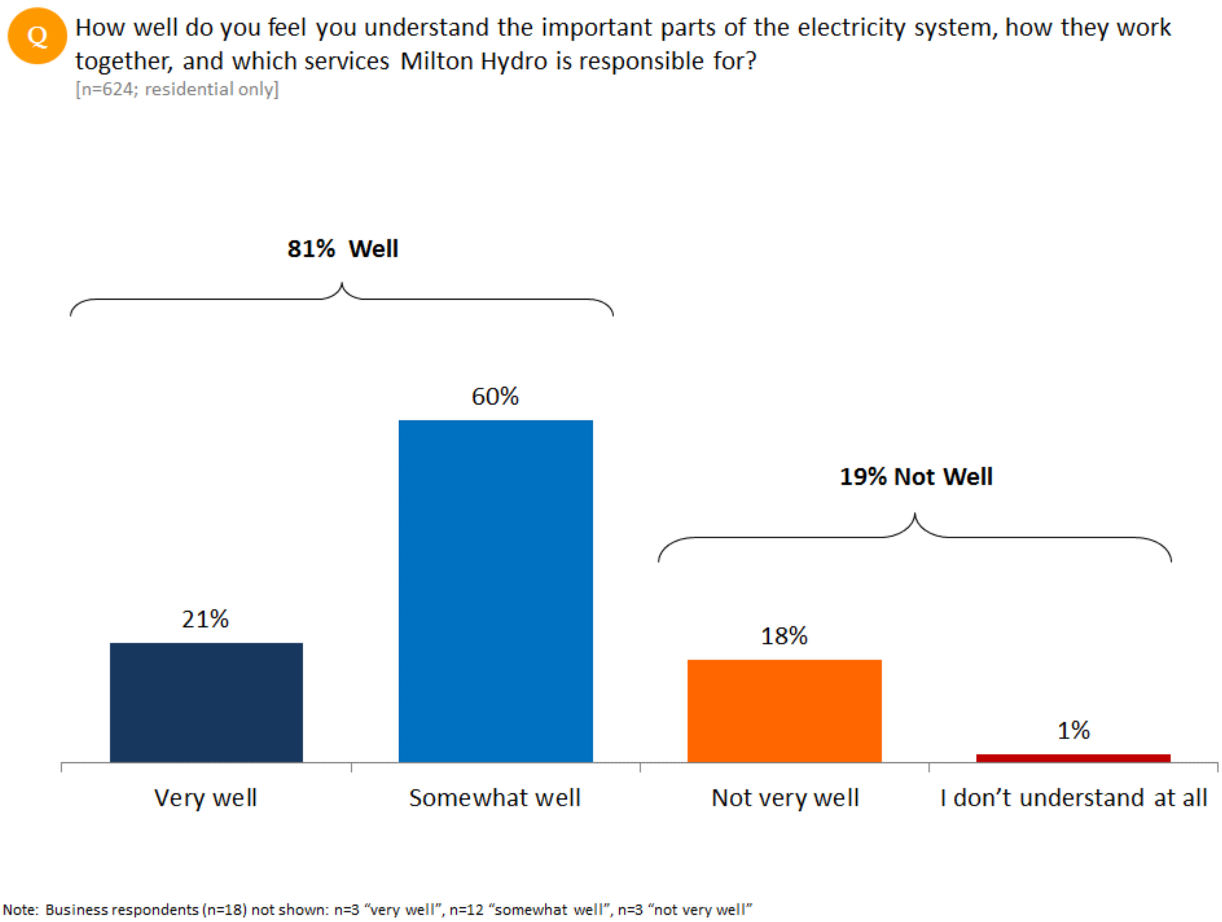
Asked how Milton Hydro might improve their service, only 234 of the 624 total respondents provided a response, which supports the high level of stated satisfaction with the utility. Of those who did provide a response, one-in-five (19%) said there is "nothing" Milton Hydro can do to improve service, and slightly fewer (16%) asked that they "reduce rates". Other mentions included "better customer service" (9%), "better online/website service" (6%), and "reduce outages" (6%). All other suggestions for improvement were mentioned by fewer than five percent of those who responded.

Figure 3: Suggestions for Improving Service



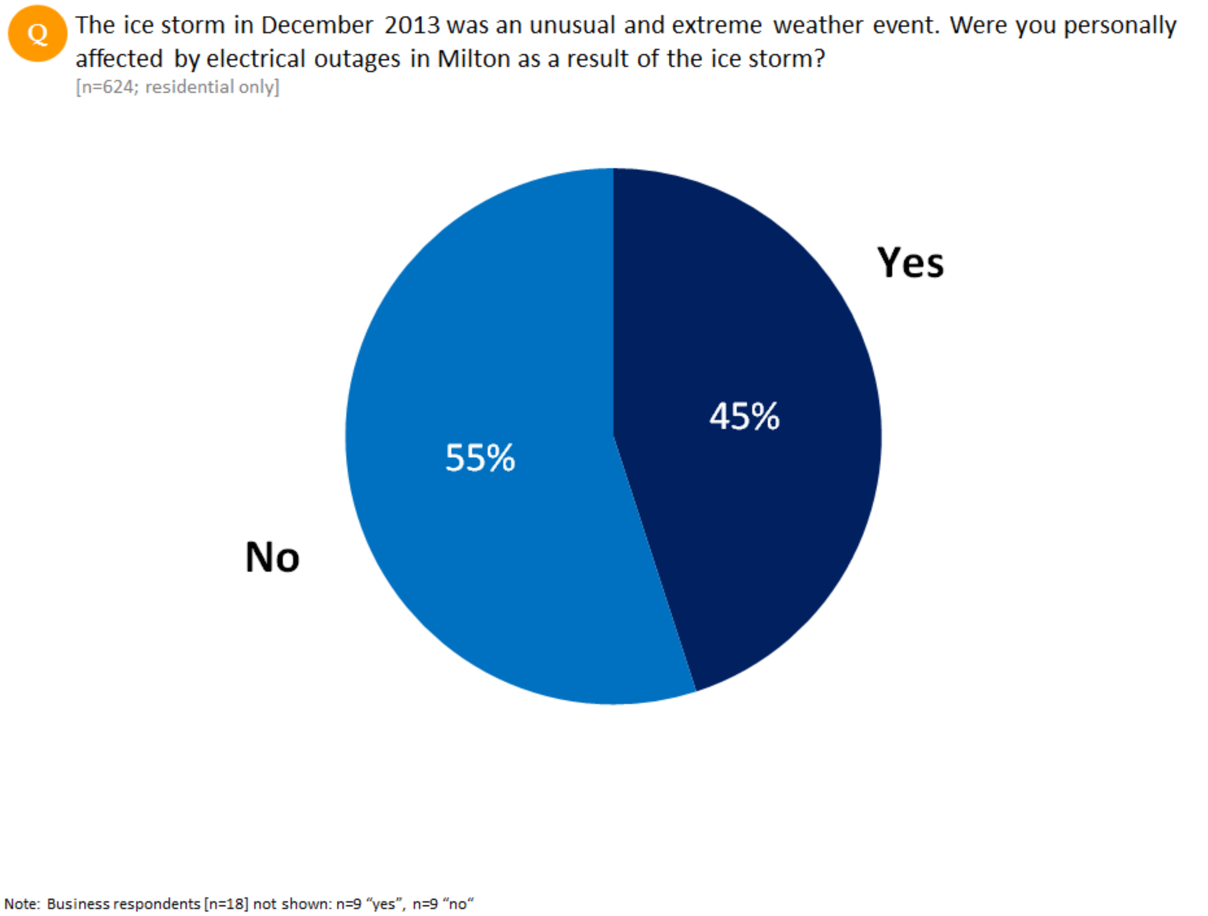
Having had an opportunity to read information about the provincial electricity system and Milton Hydro's role within it, a strong majority (81%) said they understand the important parts of the system, how they work together, and which services Milton Hydro is responsible for either *very* (21%) or *somewhat* (60%) well. One-in-five (18%) still felt they did not understand very well, or not at all (1%).

Figure 4: Understanding Milton Hydro's Role in the System



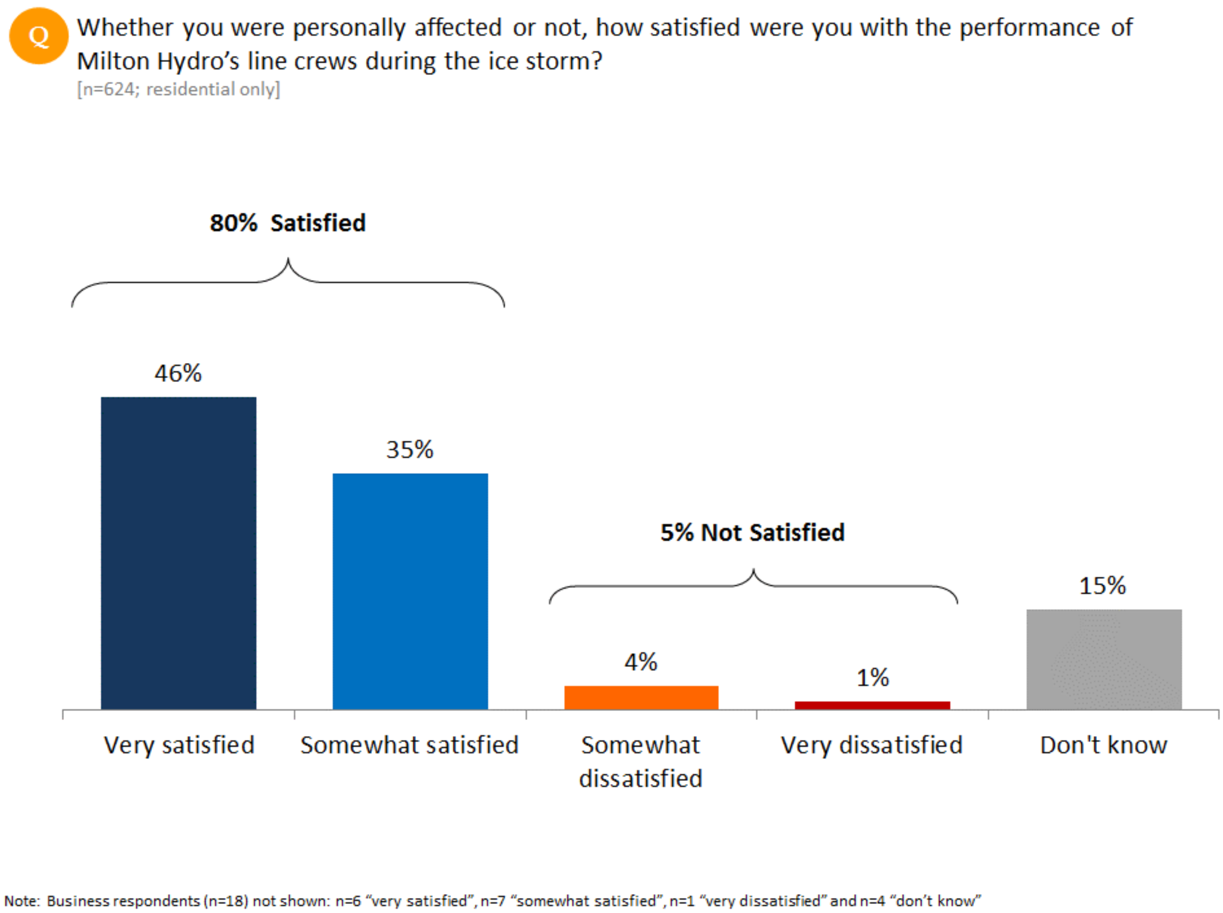
Fewer than half (45%) of respondents report being affected by electrical outages as a result of the ice storm in December of 2013.

Figure 5: December 2013 Ice Storm



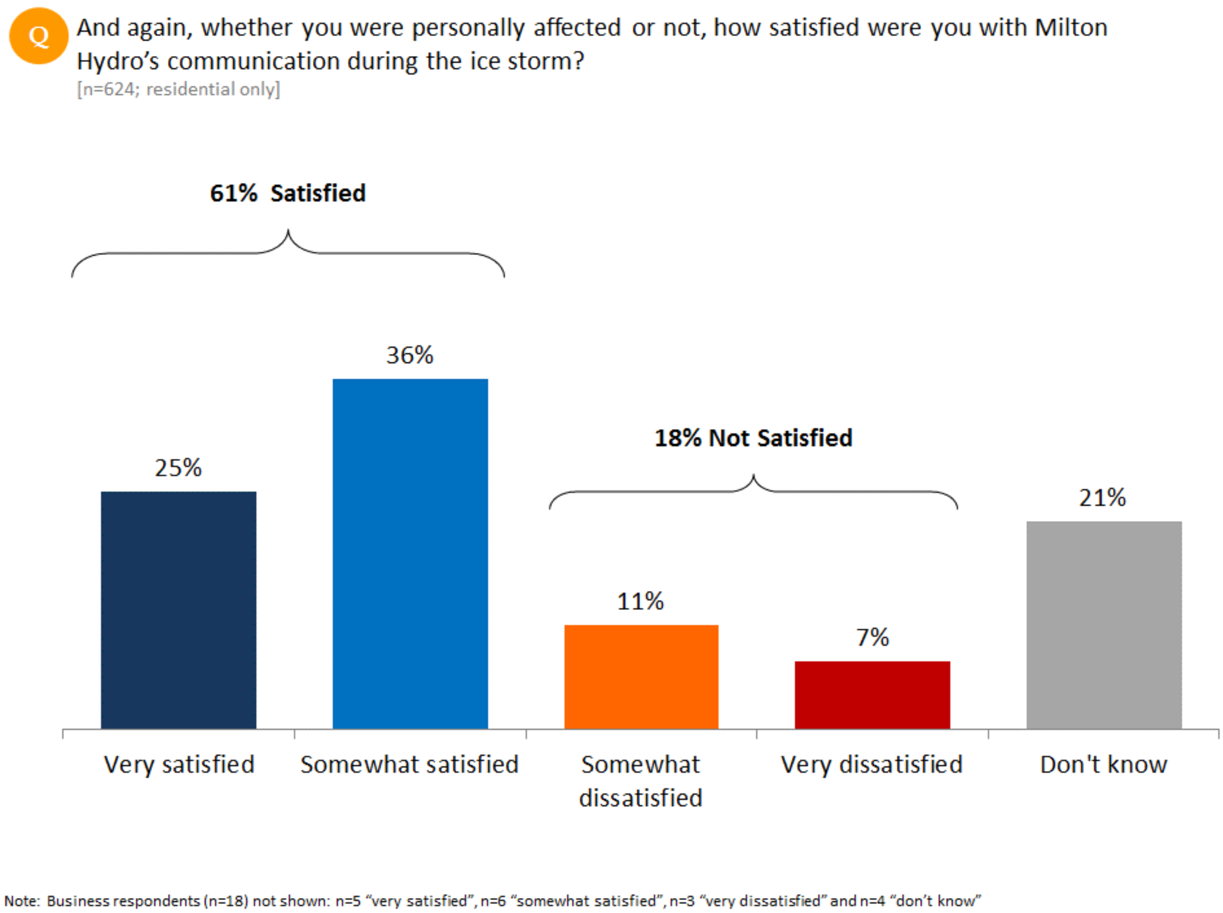
Whether they were affected or not, four-in-five (80%) were satisfied with the performance of Milton Hydro's line crews during the ice storm. Almost half (46%) said they were *very satisfied*, while an additional 35% were *somewhat satisfied*. Only five percent with either *somewhat* (4%) or *very* (1%) dissatisfied. The remainder (15%) were likely unaffected as they *don't know* if they were satisfied or not with the line crews.

Figure 6: Satisfaction with Service During the Ice Storm



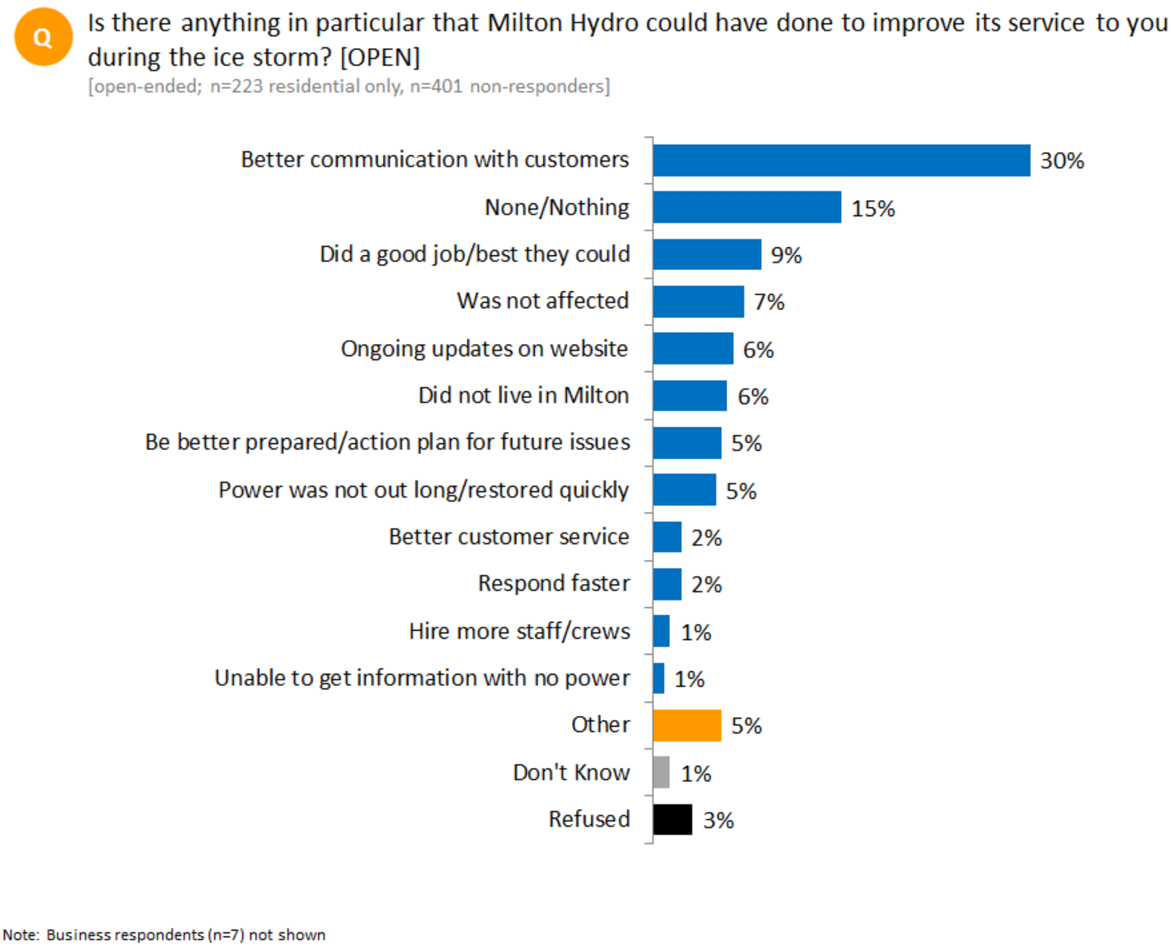
While a majority (61%) were still satisfied, the level of satisfaction with Milton Hydro's communication during the ice storm was significantly lower than the level of satisfaction with the line crews. Only one-in-four (25%) were *very satisfied*, while more (36%) reported being only *somewhat satisfied*. One-in-five were either *somewhat* (11%) or *very* (7%) dissatisfied, and the remainder (21%) *don't know*.

Figure 7: Satisfaction with Communication During the Ice Storm



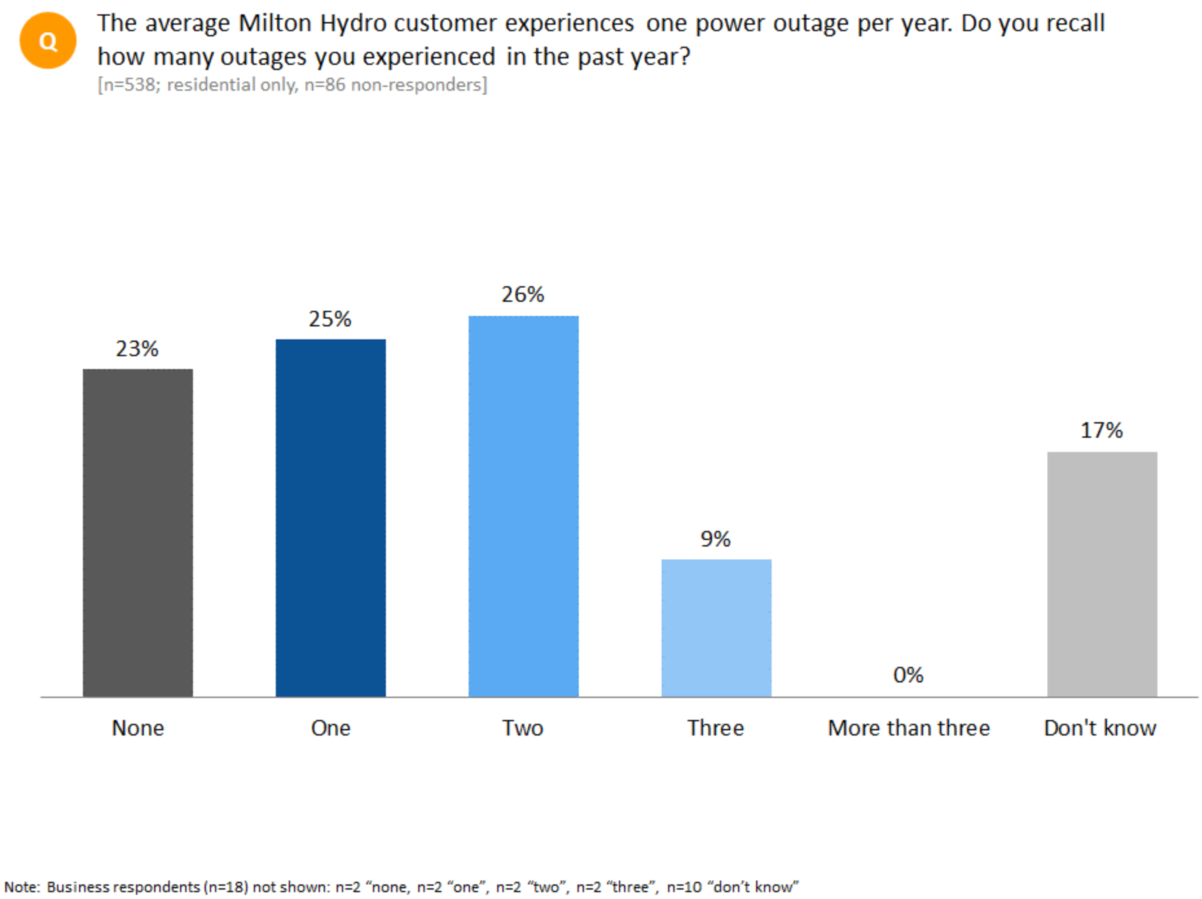
Of the 624 residential respondents, only 223 provided specific feedback on how Milton Hydro could have improved their service during the ice storm. Three-in-ten (30%) mention "better communication with customers", followed by "nothing" (15%), "did a good job" (9%) and "was not affected (7%).

Figure 8: Improving Service During the Ice Storm



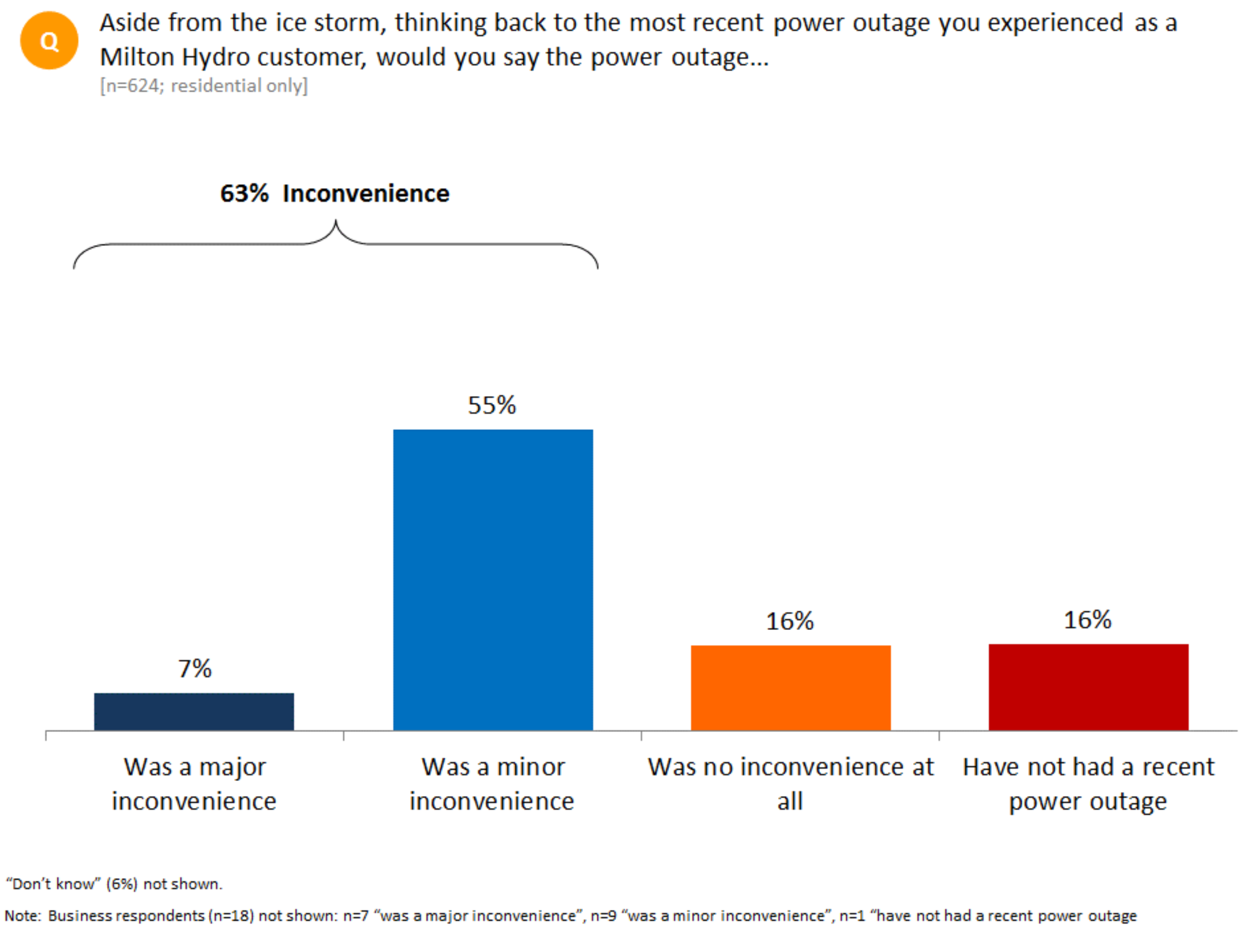
One quarter (25%) of respondents report having experienced the customer average of one power outage in the past year. Slightly fewer (23%) report not having had any outages, while slightly more (26%) report having had two outages. One-in-ten (9%) indicated having three outages, but no one claimed to have had more outages than that. About one-in-six (17%) are not sure how many outages they had in the past year.

Figure 9: Outages in Past Year



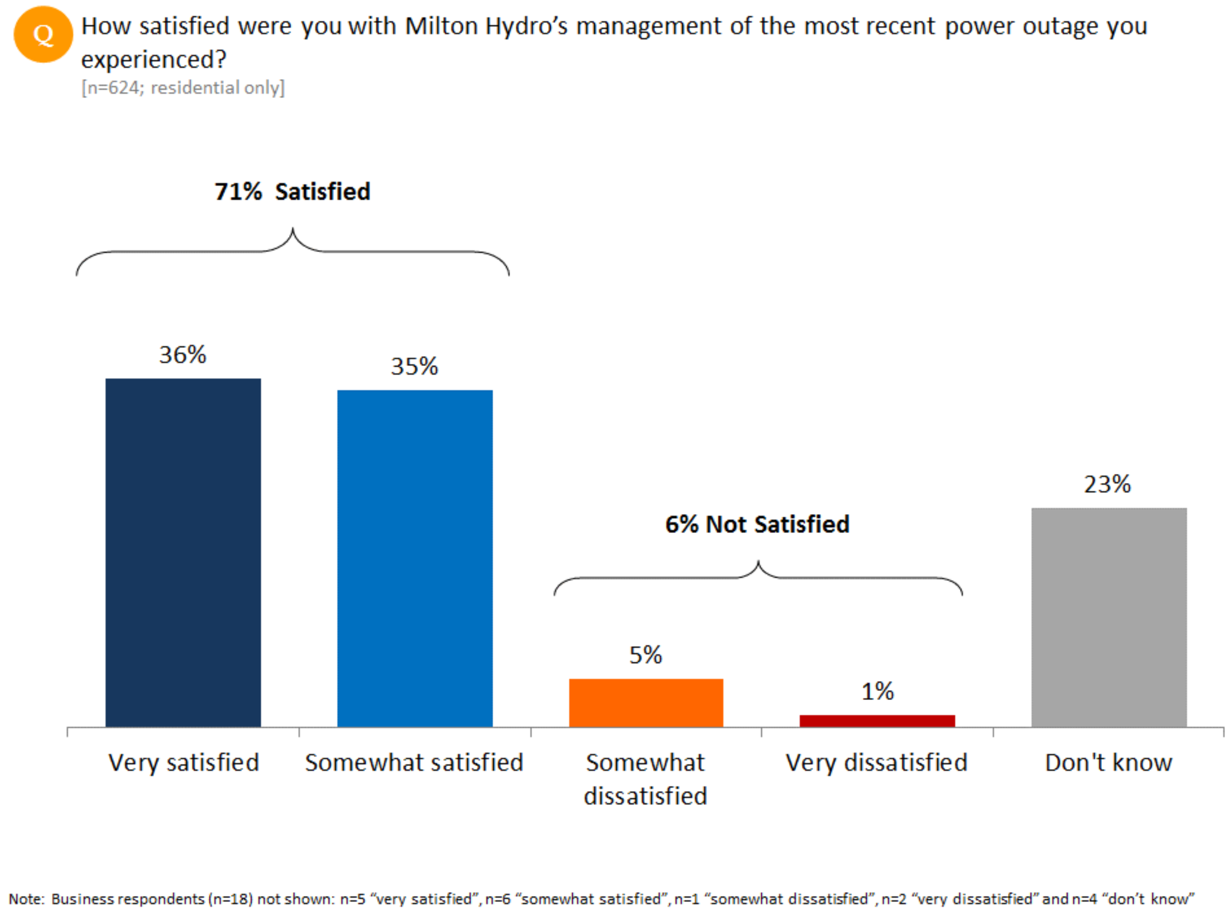
While almost two thirds (63%) report that their most recent power outage was an inconvenience, most (55%) indicate that it was only a *minor* inconvenience. Only seven percent say their most recent power outage was a *major* inconvenience, while more than twice as many (16%) say theirs was *no inconvenience at all*.

Figure 10: Impact of Most Recent Outage



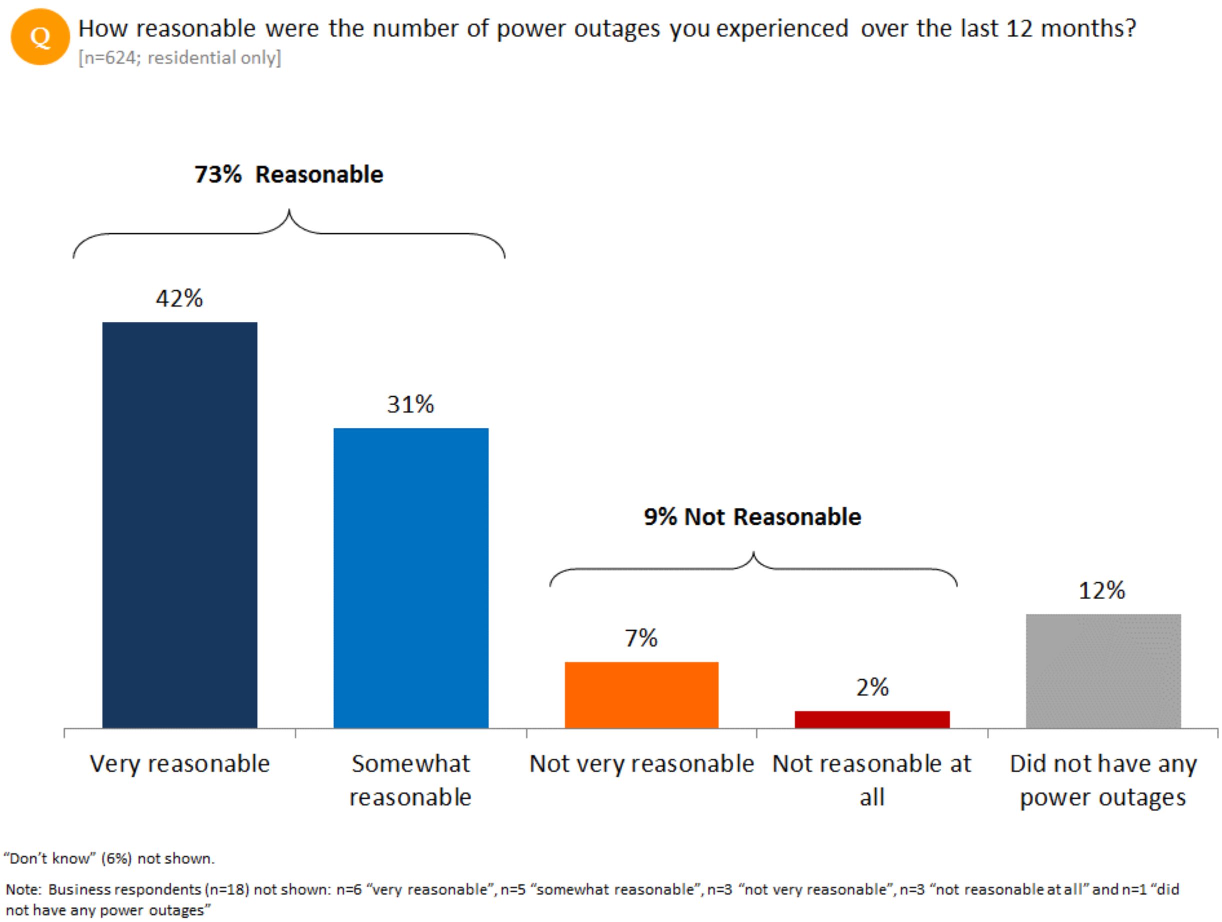
Asked how satisfied they were with Milton Hydro's management of their most recent power outage, seven-in-ten (71%) say there were either *very* (36%) or *somewhat* (35%) satisfied. Only six percent were dissatisfied, and the remainder (23%) *don't know*.

Figure 11: Satisfaction with Management of Most Recent Outage



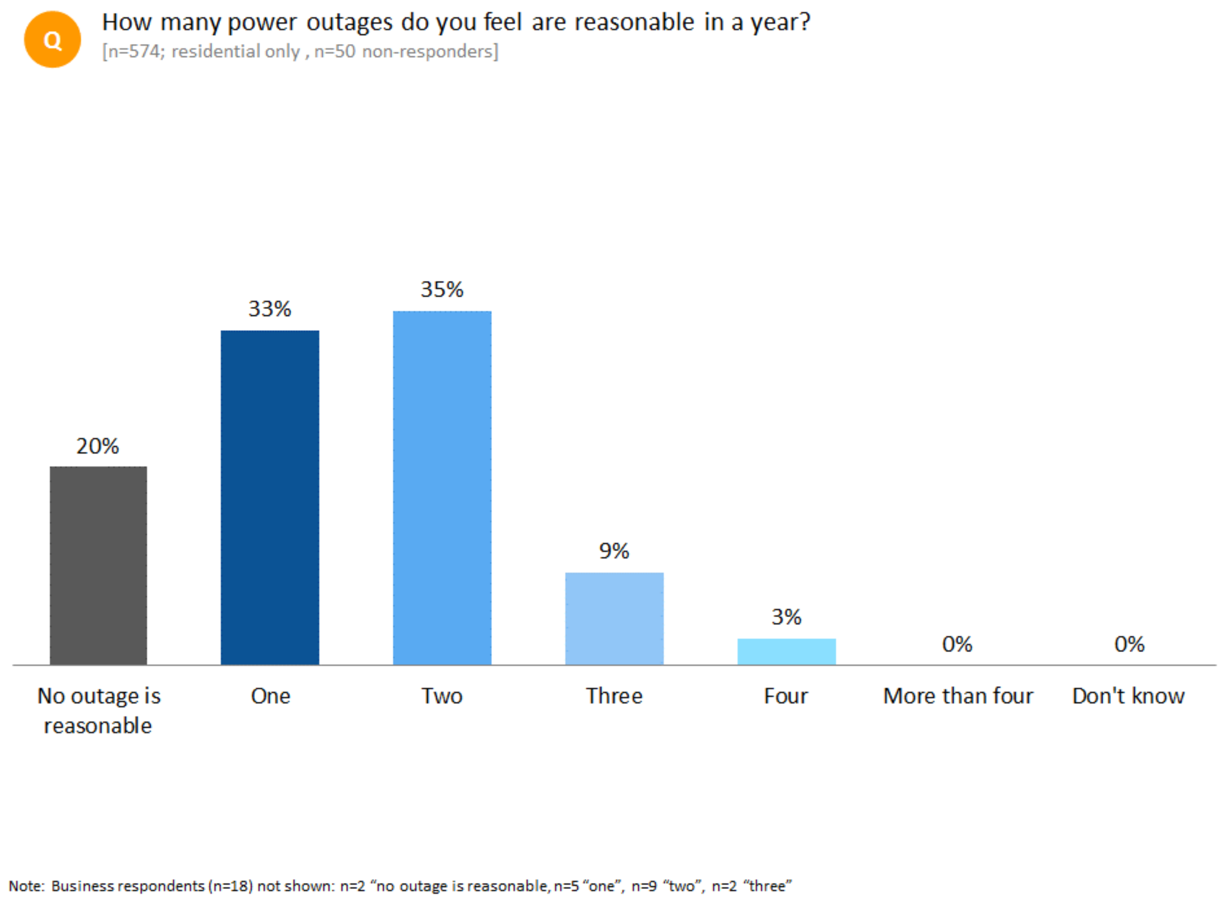
Generally speaking, survey respondents have no issue with the frequency of outages they have recently experienced. Almost three quarters of respondents say the number of power outages they experienced over the last 12 months is either *very* (42%) or *somewhat* (31%) reasonable. Seven percent say the number of outages they experienced is *not very reasonable*, while another two percent say it is *not reasonable at all*. The remainder (12%) say they did not have any power outages.

Figure 12: Number of Outages – Acceptability



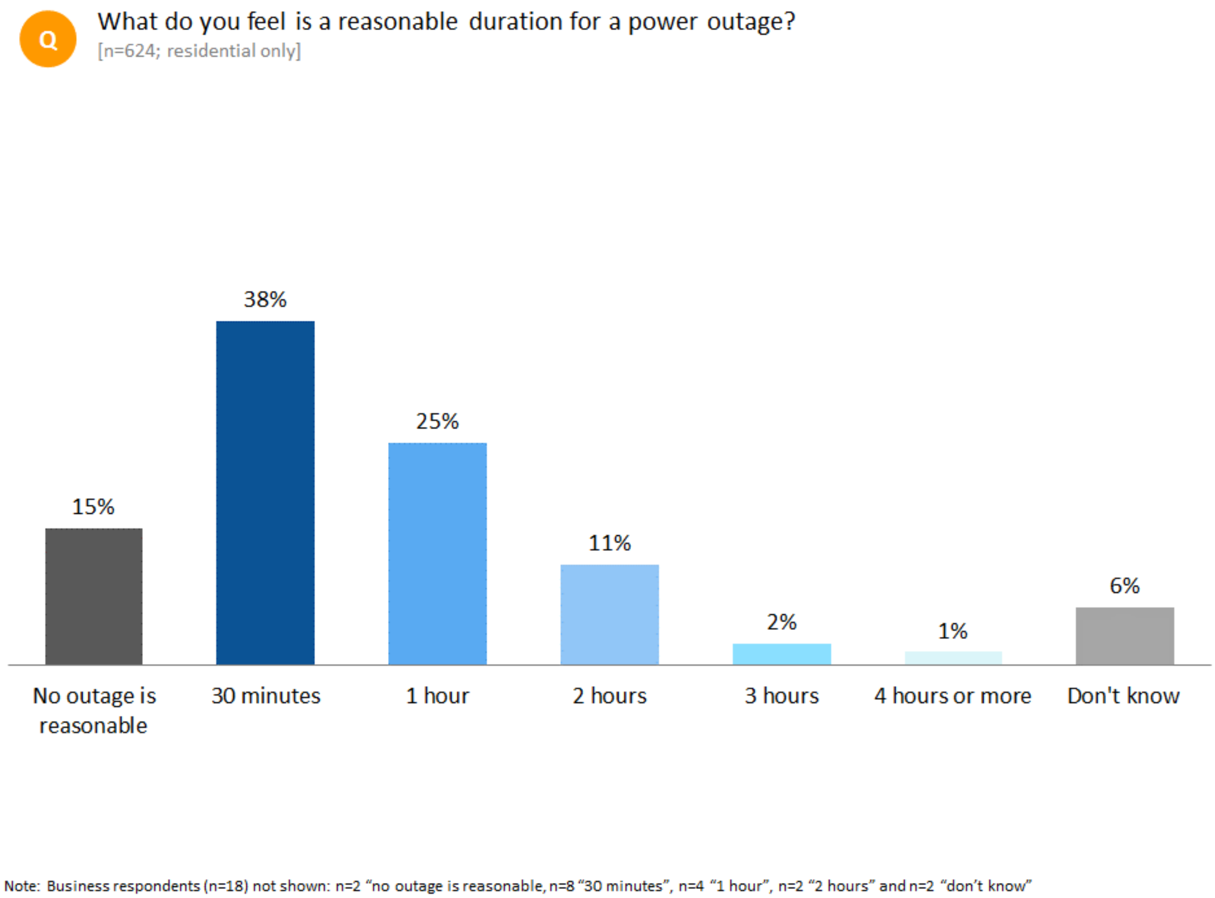
More than one third (35%) feel that two outages in a year is reasonable, which is twice the current average among Milton Hydro customers. One third (33%) say only one outage is reasonable, while one-in-five (20%) feel that no outage is reasonable. Significantly fewer feel that three (9%) or even four (3%) outages would be reasonable in a year.

Figure 13: How Many Outages are Reasonable?



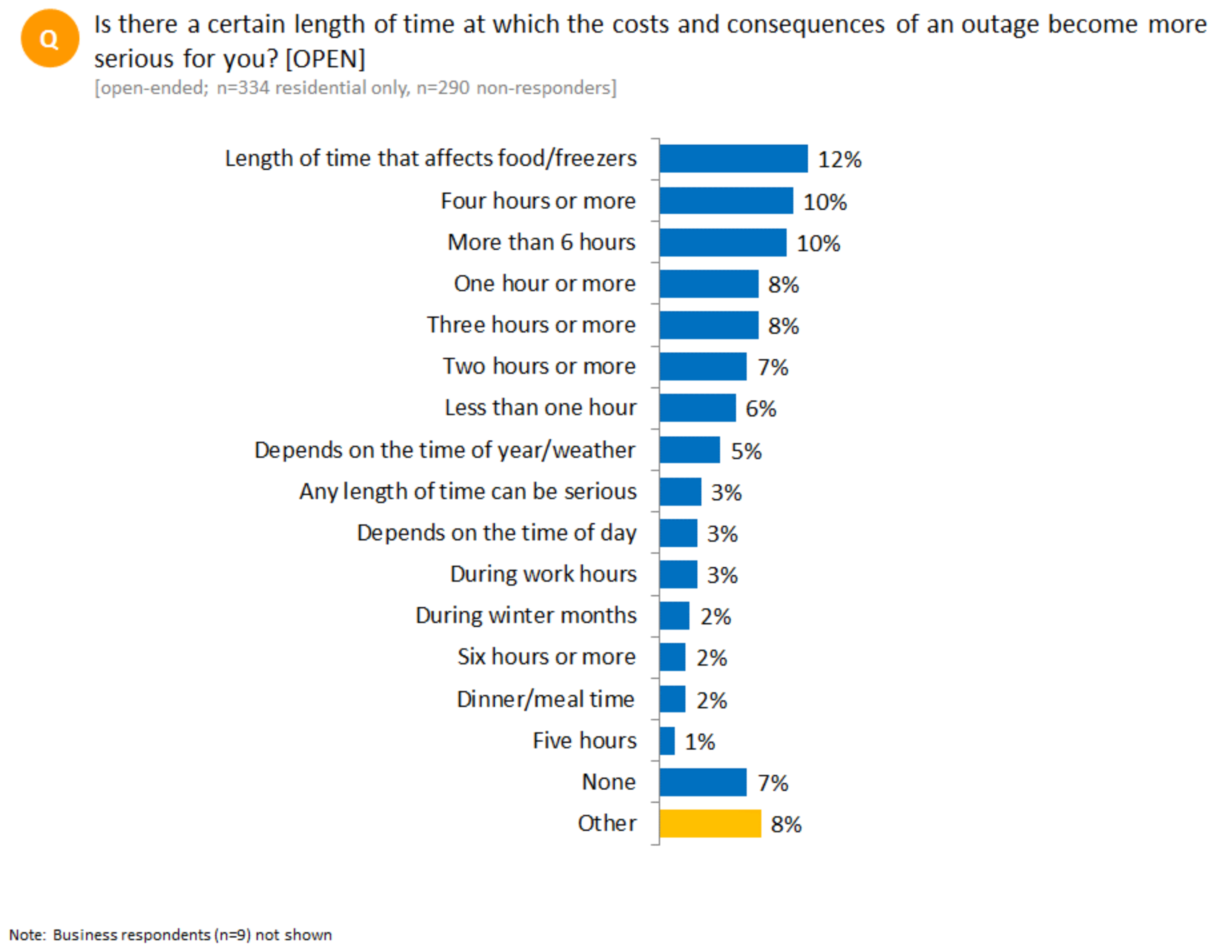
While some (15%) maintain that no outage is reasonable, most feel that one hour (25%) or less (38% chose 30 minutes) is a reasonable duration for a power outage. One-in-ten (11%) say two hours is reasonable, and three percent feel a three (2%) or four (1%) hour outage is reasonable.

Figure 14: Reasonable Duration of Outages



Among those who provided a response to this open-ended question, more than one-in-ten (12%) say that the "length of time that affects food/freezers" is the point at which the costs and consequences of an outage become more serious for them. Some provided specific time references, with "four hours or more" (10%) and "more than six hours" (10%) being the most common responses. Still others say it "depends on the time of year/weather" (5%) or it "depends on the time of day" (3%).

Figure 15: Point at Which Cost and Consequences Become More Serious

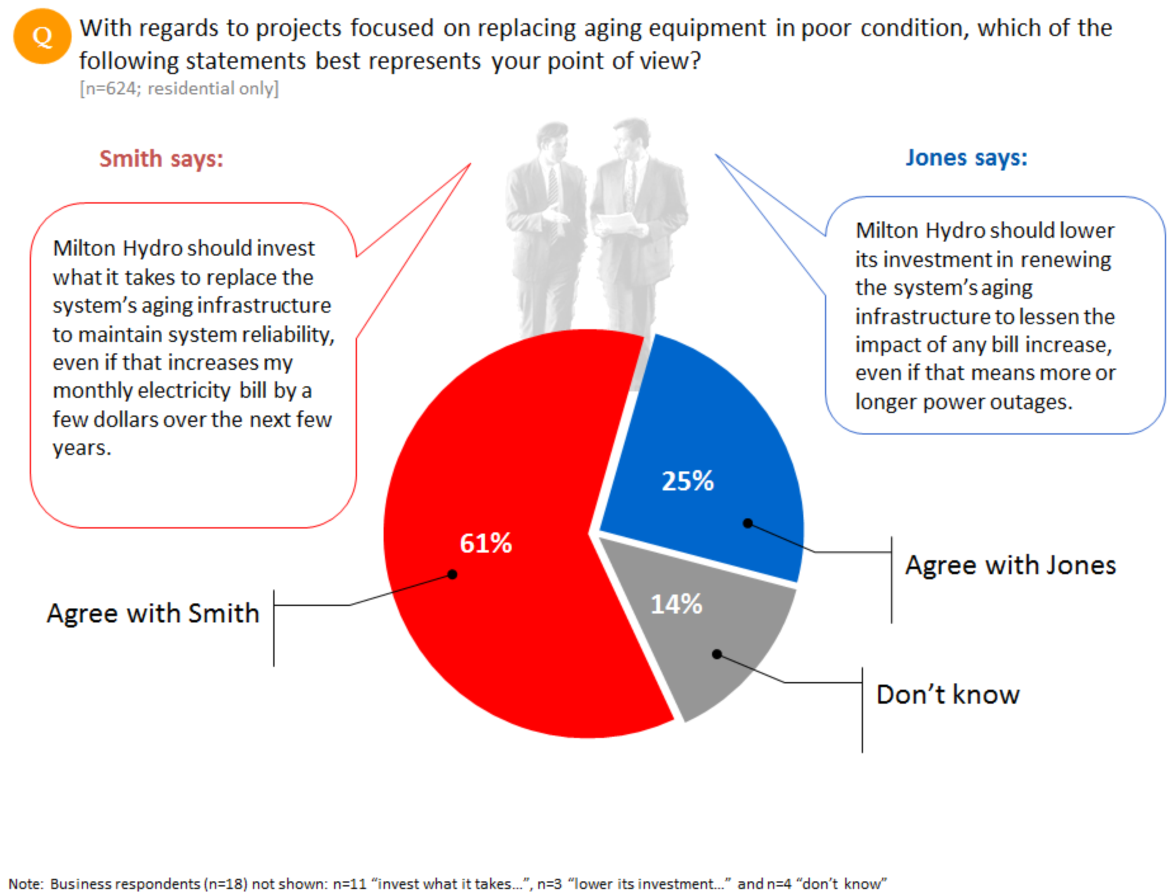


Investment Solutions and Cost Drivers

In this section, we gauge customer preferences when it comes to investing in the distribution system, and the extent to which they understand the cost drivers that Milton Hydro is responding to. Respondents are also asked the extent to which they would be likely to participate in a conservation and demand management (CDM) program.

Given the choice between investing what it take to replace the system's aging infrastructure to maintain system reliability, even if it means an increase to their electricity bill and lower investment to lessen impact of a bill increase even if that means more or longer power outages, a majority (61%) prefer that Milton Hydro invests what is needed to maintain reliability. Only one quarter (25%) prefer lowering investment and risking more or longer outages, and the remainder (14%) don't know which option they prefer.

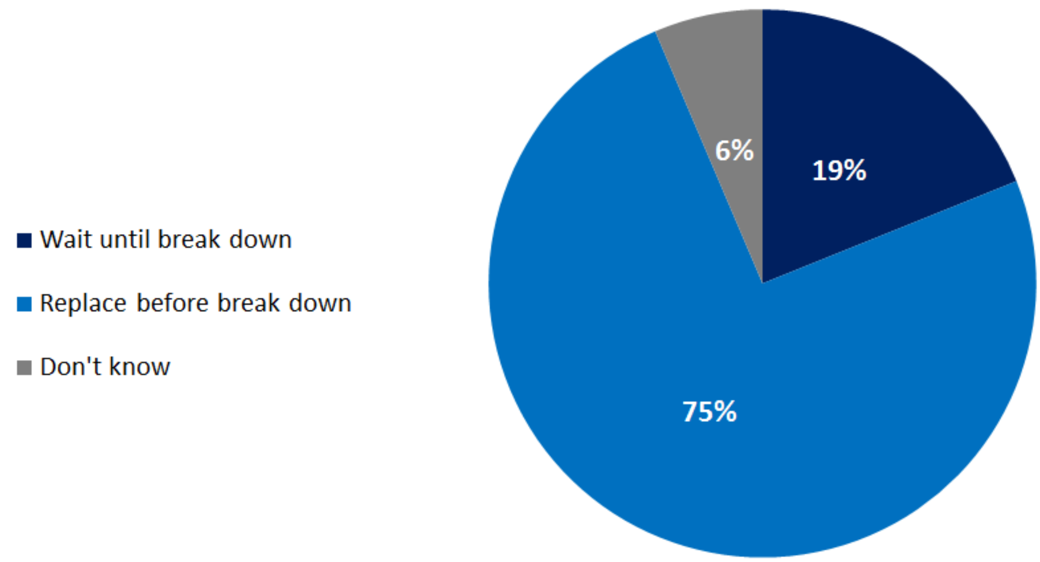
Figure 16: Investing in Aging Equipment



When dealing with aging equipment in the grid, three-quarters (75%) feel the best approach is to replace the equipment before it breaks down to avoid power outages, even if it means not getting all the use possible from each piece of equipment. Conversely, only one-in-five (19%) prefer a "run-to-failure" approach in which equipment breaks down before it is replaced in order to get the full value from each piece of equipment.

Figure 17: Run-to-Failure or Proactive Replacement?

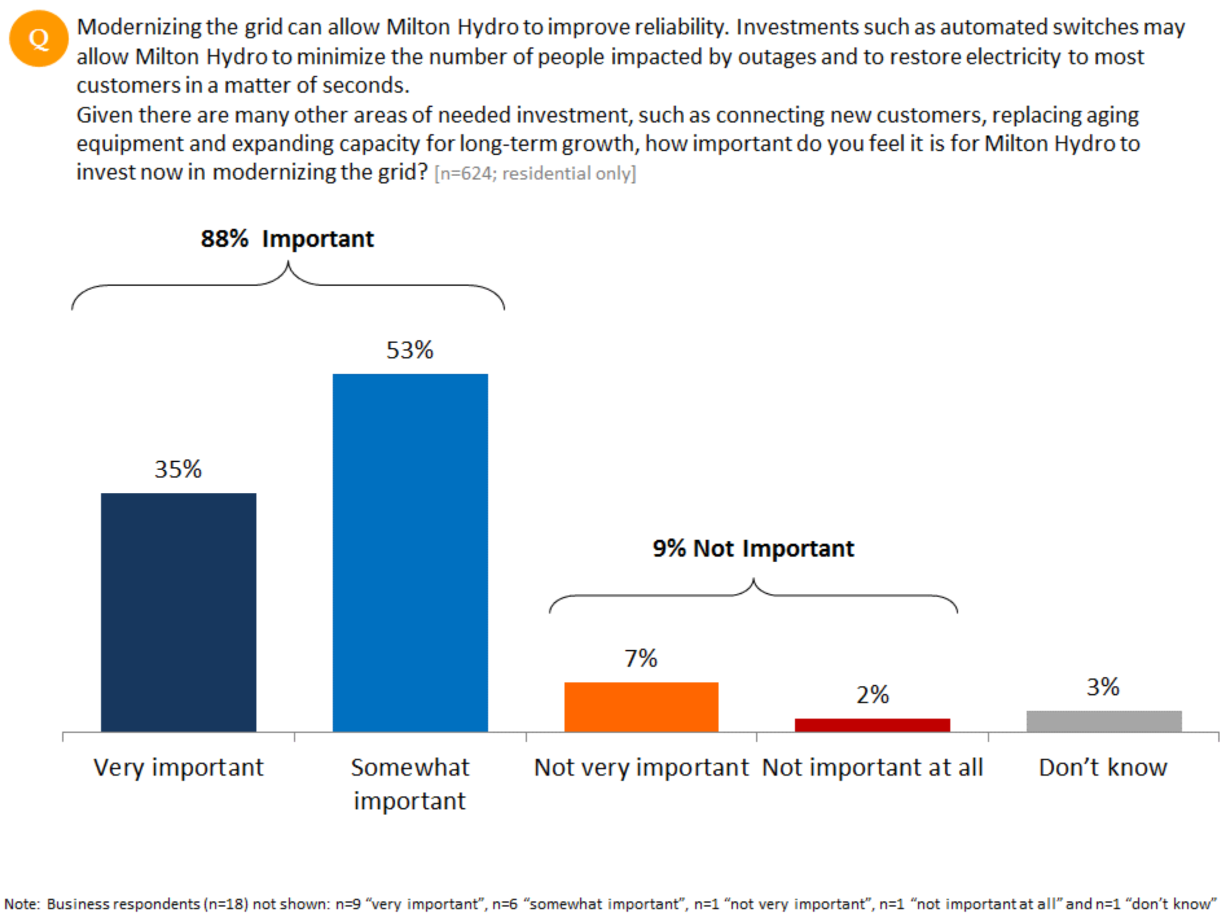
Q Thinking about the aging equipment in the grid, do you feel it's best to wait until the equipment breaks down to get full value from each piece of equipment, even if it means power outages, or do you feel the best approach is to replace the equipment before it breaks down to avoid power outages, even if it means not getting all the use possible from each piece of equipment?
[n=624; residential only]



Note: Business respondents (n=18) not shown: n=3 "wait until break down", n=13 "replace before break down" and n=2 "don't know"

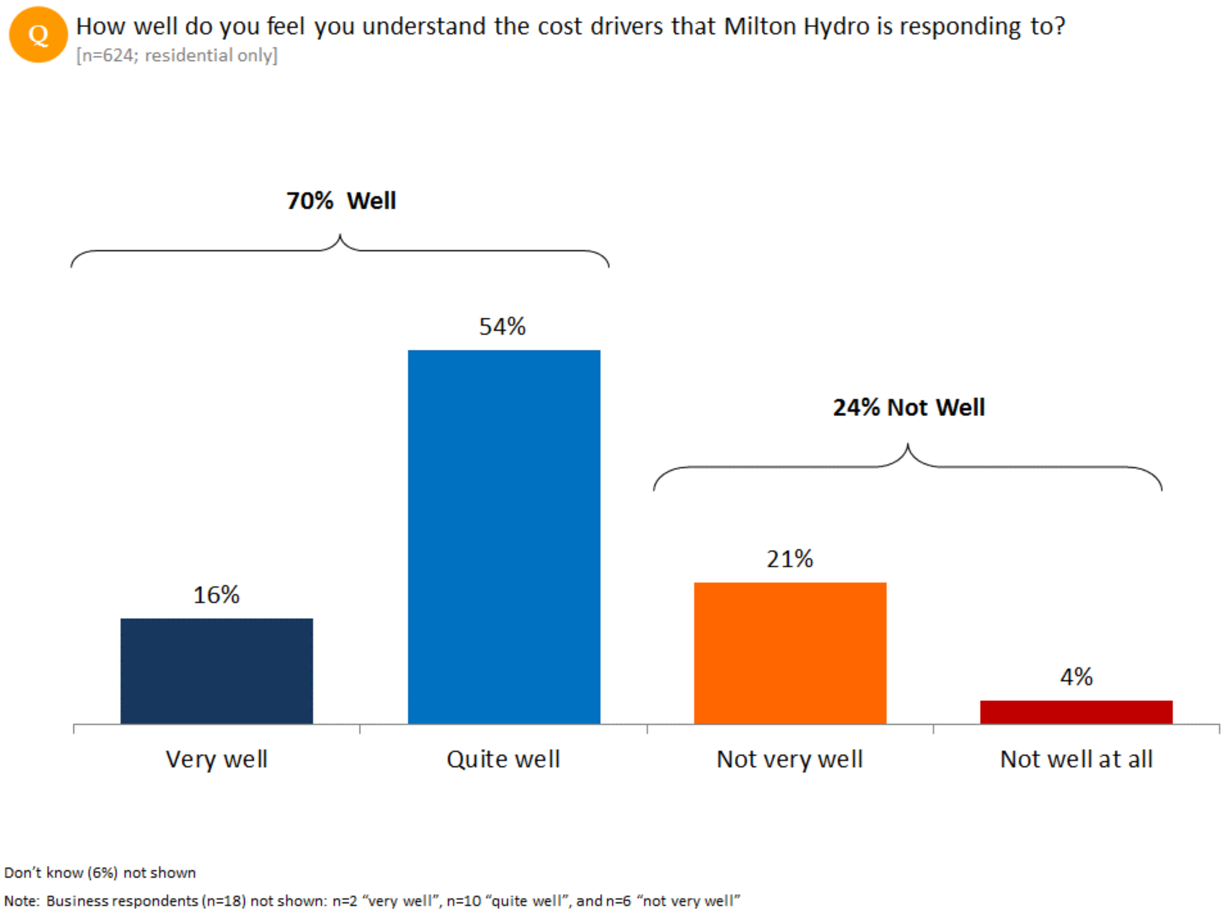
Almost nine-in-ten (88%) feel it is either *very* (35%) or *somewhat* (53%) important for Milton Hydro to invest now to modernize the grid, even though there are many other areas of needed investment, such as connecting new customers, replacing aging equipment and expanding system capacity for long-term growth. Only one-in-ten (9%) feel it is *not very important* (7%) or *not important at all* (2%) to invest in modernizing the grid at this point.

Figure 18: Modernizing the Grid



After having an opportunity to review the details of some of Milton Hydro's primary cost drivers, seven-in-ten (70%) feel they understand these drivers either *very* (16%) or *somewhat* (54%) well. However, there are one quarter who feel they understand these drivers either *not very well* (21%) or *not well at all* (4%).

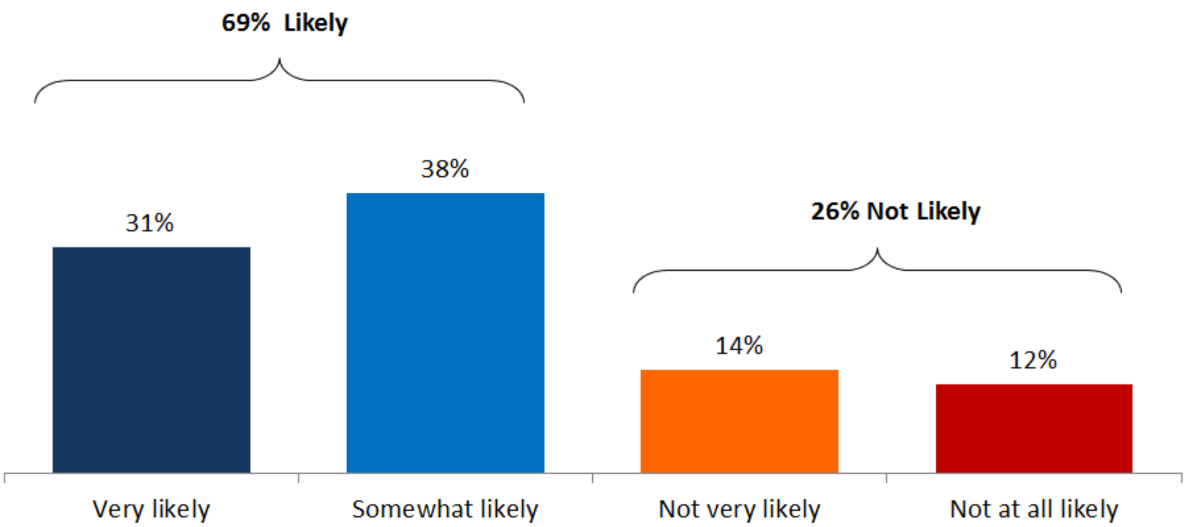
Figure 19: Understanding Milton Hydro's Cost Drivers



Almost seven-in-ten (69%) of respondents indicate that they are *very* (31%) or *somewhat* (38%) likely to participate in CDM programs that would involve automated devices to turn off their water heater or air conditioner for short periods during times of peak demand. Conversely, one-in-four (26%) report that they are *not very* (14%) or *not at all* (12%) likely to participate in such programs.

Figure 20: CDM Programs

Q In order for conservation and demand management (CDM) programs to slow the pace of system renewal and expansion, they must lower electricity consumption at peak demand. How likely is it that you would participate in CDM programs that subsidize your investments in building energy efficiency improvements? For residential customers, this would involve automated devices to turn off your water heater and air conditioner for short periods during times of peak demand. [n=624; residential only]



Don't know (5%) not shown

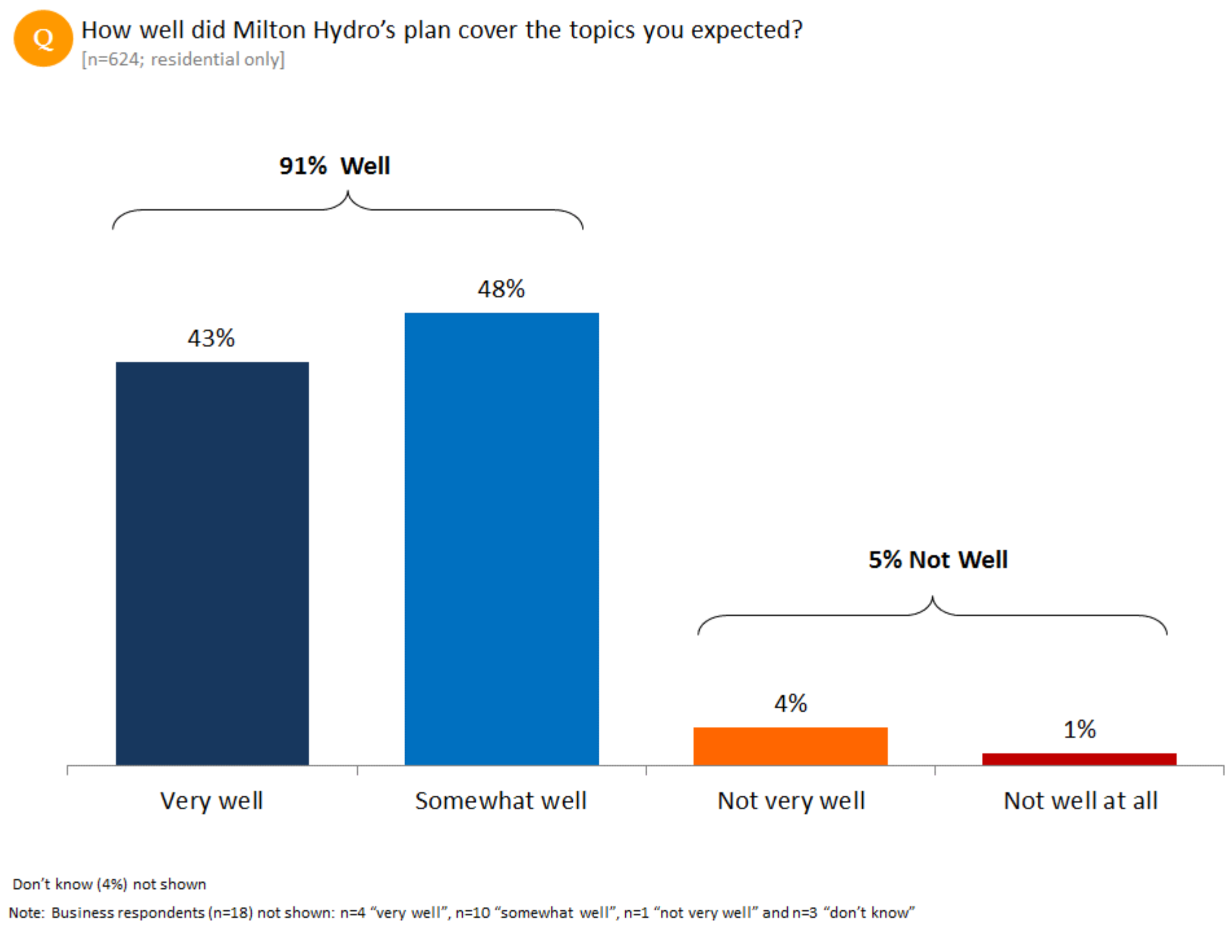
Note: Business respondents (n=18) not shown: n=2 "very likely", n=13 "somewhat likely", n=3 "not very likely"
Question for business respondents: In order for conservation and demand management (CDM) programs to slow the pace of system renewal and expansion, they must lower electricity consumption at peak demand. How likely is it that your organization would participate in CDM programs that subsidize your investments in building energy efficiency improvements?

Budget, Planning and Rate Impact

In this section, we look at how customers respond to the information that has been presented to them: Did it cover the topics they expected? How well is Milton Hydro planning for the future, based on what they have read? And, finally, how willing are they to accept the rate increase that is proposed in conjunction with Milton Hydro's investment plan?

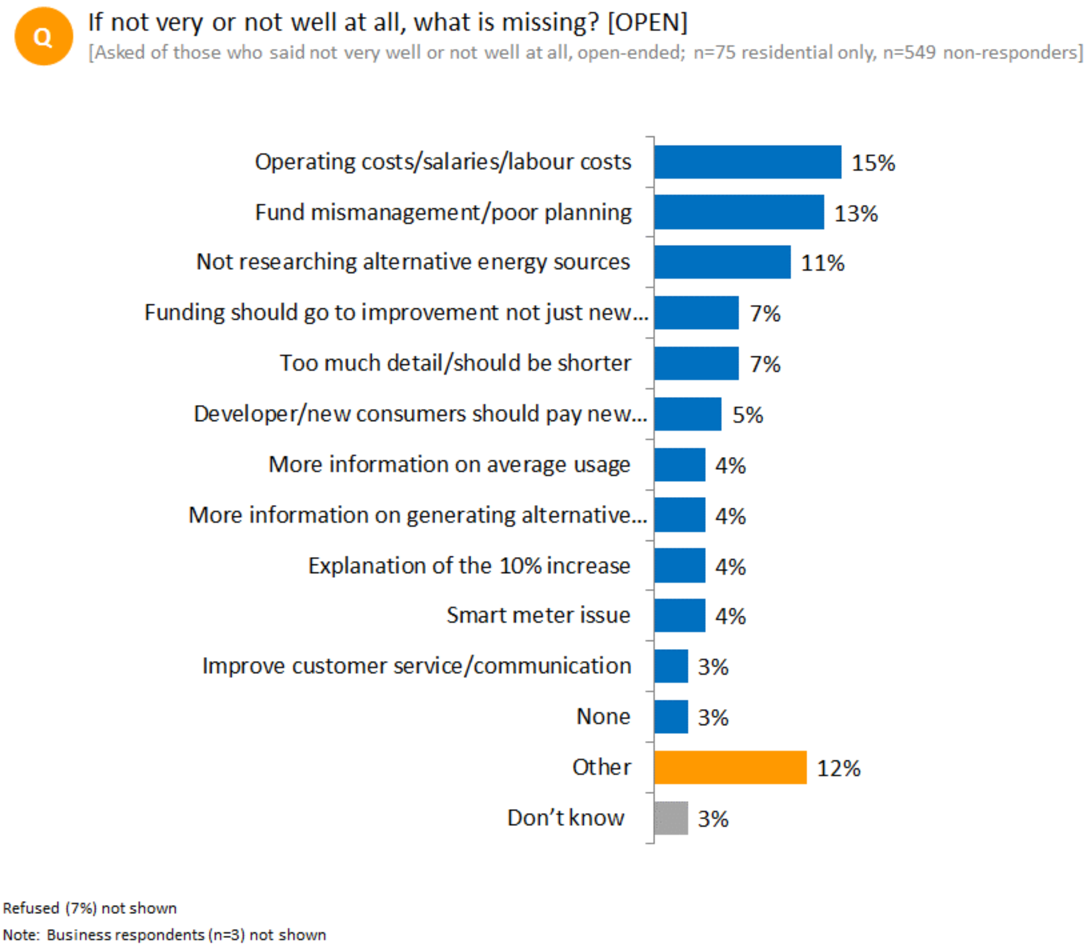
At the end of the workbook, the vast majority feel that Milton Hydro's plan covered the topics they expected either *very* (43%) or *somewhat* (48%) well. Only five percent feel otherwise.

Figure 21: Coverage of Expected Topics



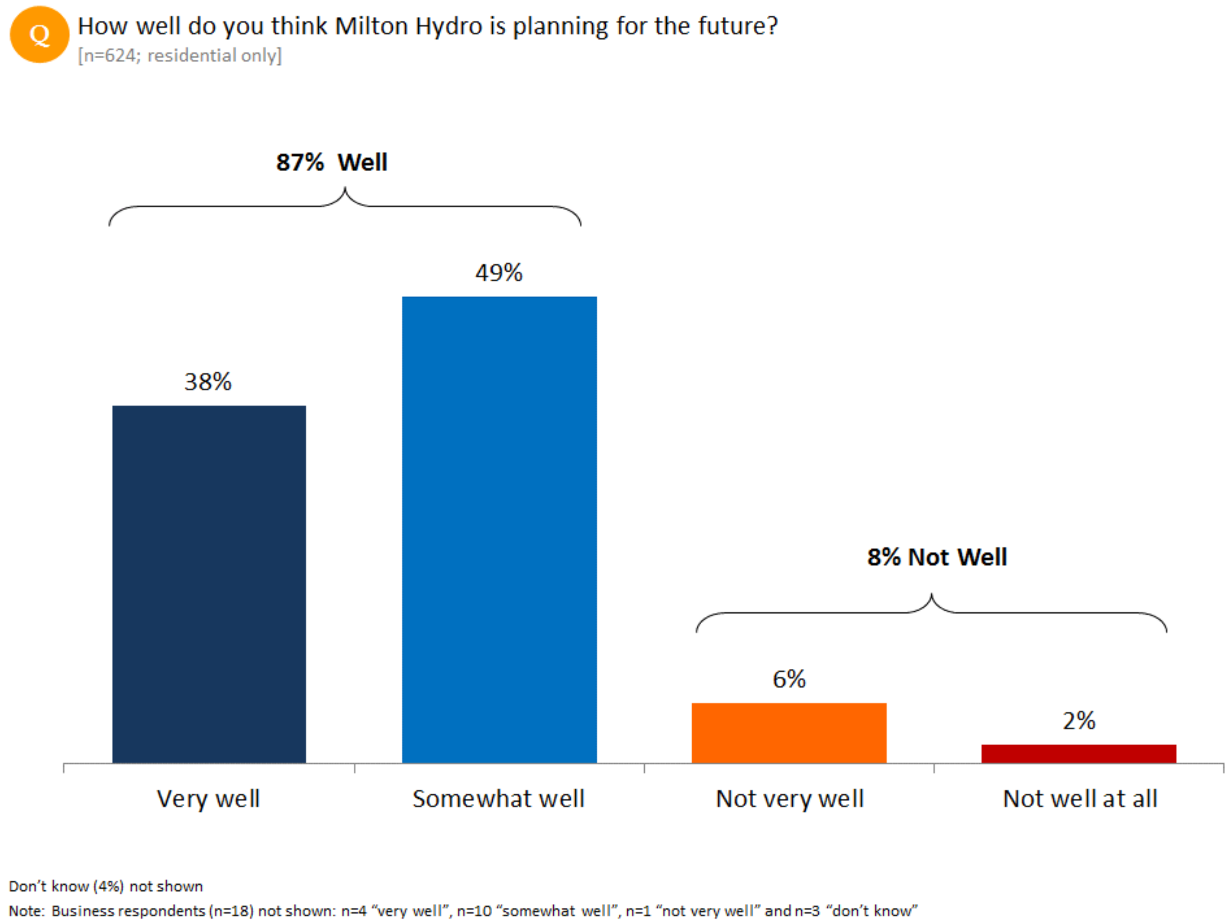
Among those who felt there was something missing from the plan (n=75) "operating costs/salaries/labour costs" (15%) was mentioned most frequently, followed by "fund mismanagement/poor planning" (13%) and "not researching alternative energy sources" (11%).

Figure 22: Perceived Missing Content



After reviewing the information provided in the workbook most feel Milton Hydro is planning for the future either *very* (38%) or *somewhat* (49%) well. Fewer than one-in-ten disagree (6% *not very well*, 2% *not well at all*).

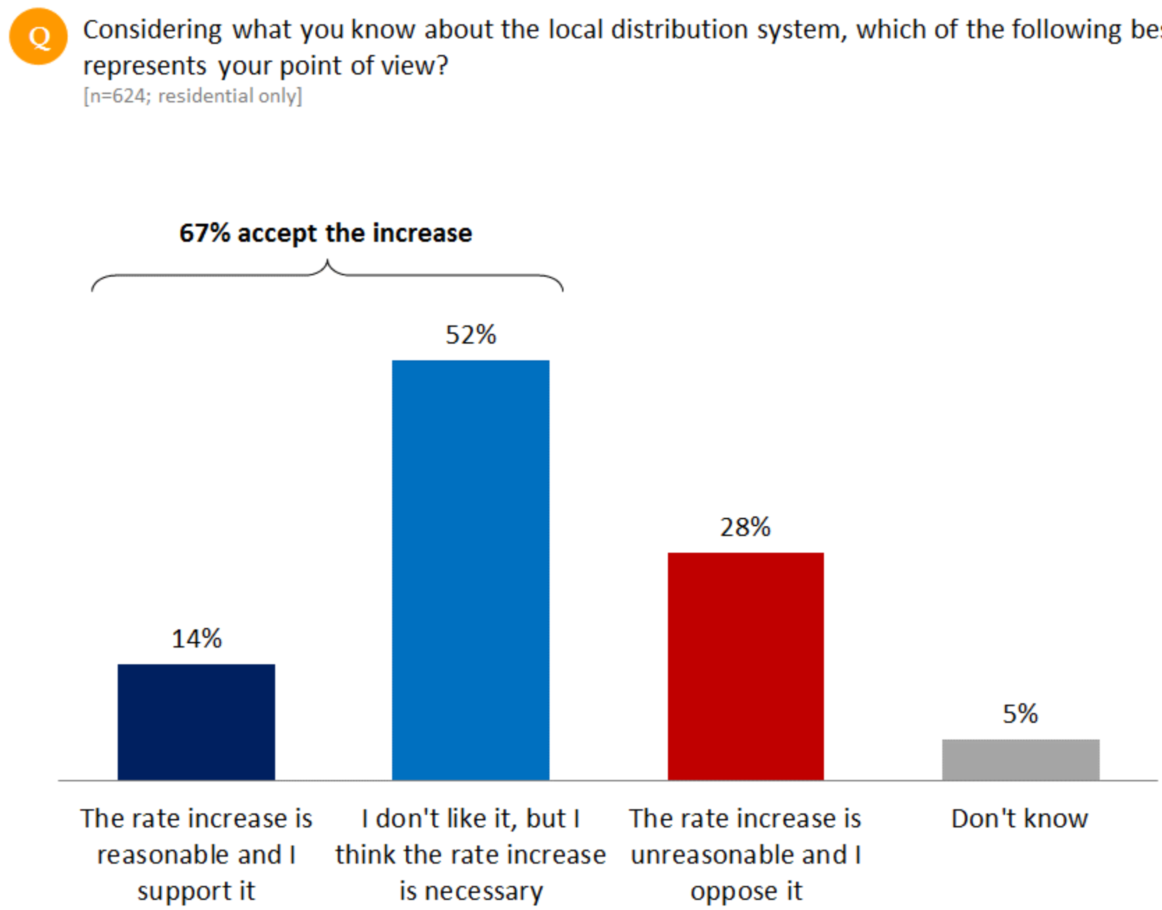
Figure 23: Is Milton Hydro Planning for the Future?



The final question in the workbook asks respondents the extent to which they are prepared to accept the rate increase that is detailed in Milton Hydro's Distribution System Investment Plan. Respondents are not just asked if they support or oppose the rate increase, because it is unlikely that customers would state that they support an increase in their electricity costs. They are also given the option of saying they don't like it but can see that it is necessary.

Only about one-in-seven (14%) say *the rate increase is reasonable and I support it*, but more than half (52%) say *I don't like it, but I think the rate increase is necessary*. This brings the total level of social acceptance to just over two thirds (67%). Fewer than three-in-ten (28% say *the rate increase is unreasonable and I oppose it*, and the remaining five percent don't know how they feel about it.

Figure 24: Acceptance of Rate Increase



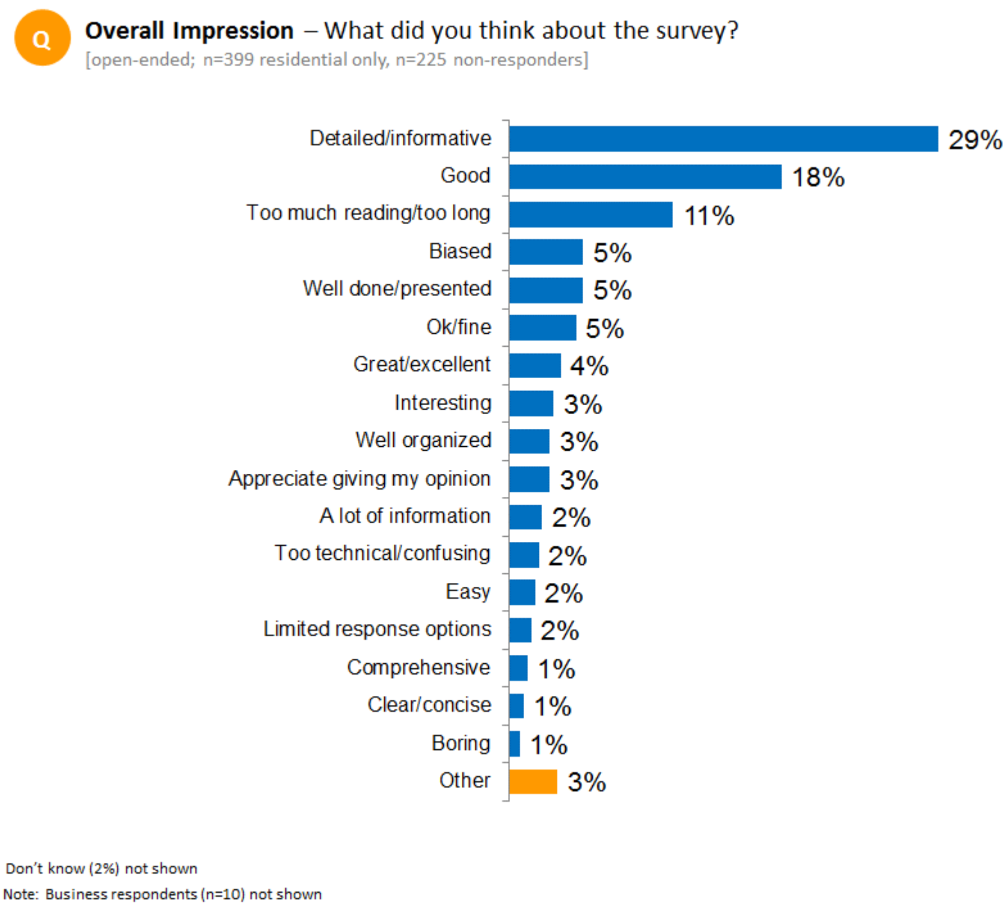
Note: Business respondents not shown [n=18] – n=3 "reasonable and I support it", n=9 "don't like it … necessary", n=4 "unreasonable and I oppose it"

Feedback on Workbook Design

Once all core survey questions have been asked, respondents are asked – on an open-ended basis – to provide feedback on the workbook itself and the manner in which the consultation is conducted.

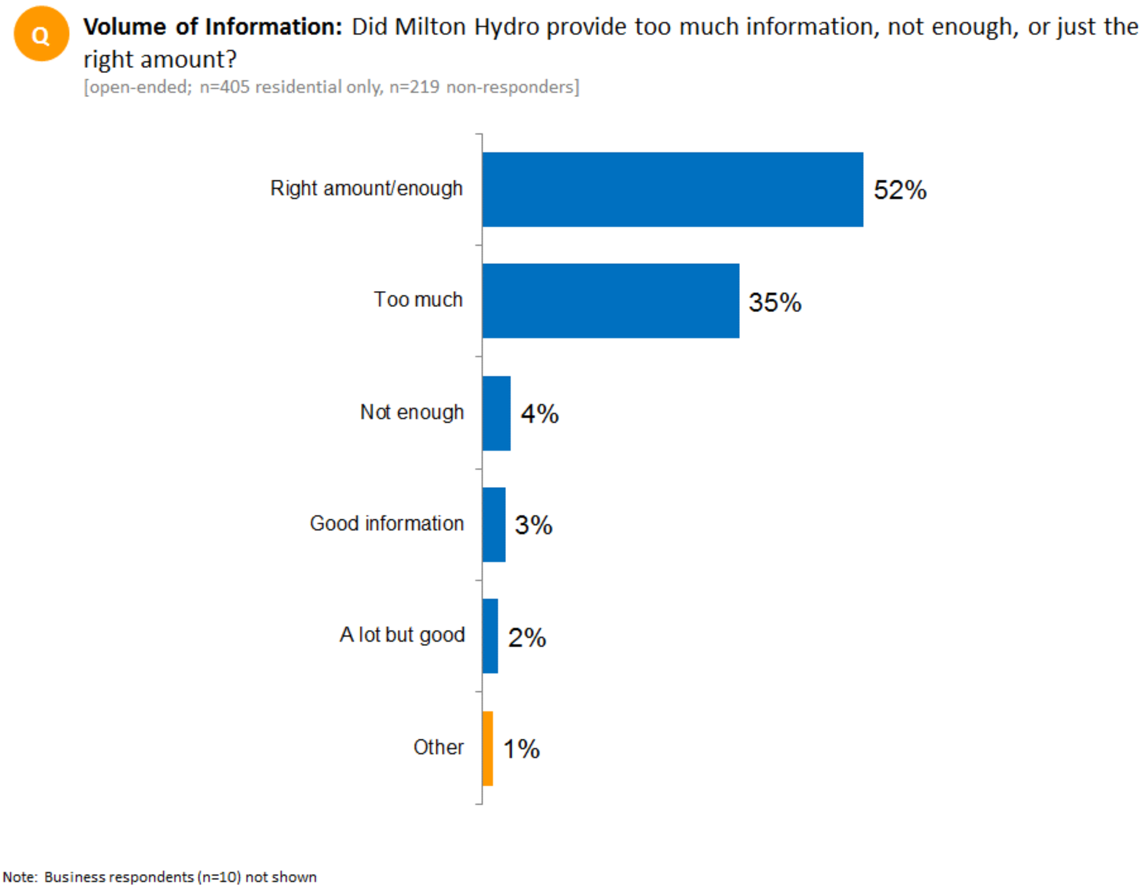
Among the 399 who provided a response to this question, overall impression of the online survey is positive, with a plurality describing it as “detailed/informative” (29%) or “good” (18%). There were some who found it was “too much reading/too long” (11%) or that it was “biased” (5%).

Figure 25: Overall Impression



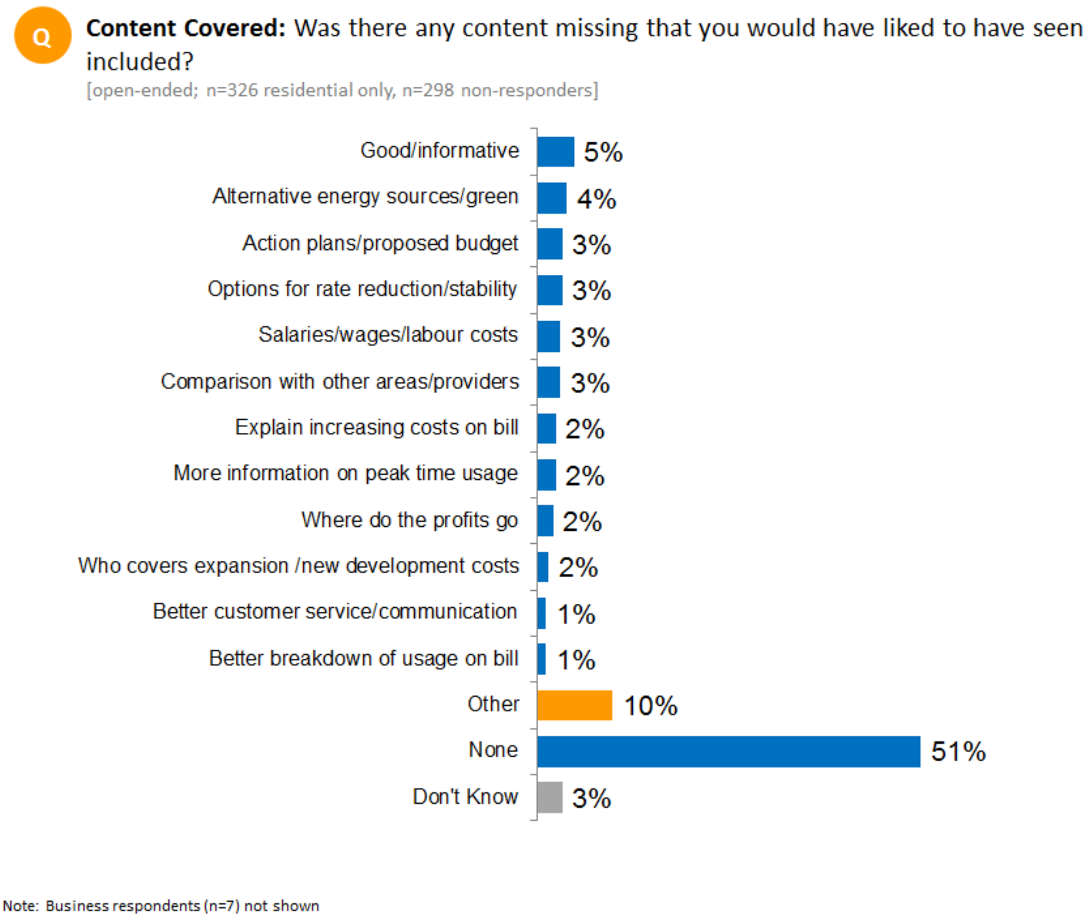
Most respondents (n=405) gave their feedback in terms of the volume of information provided by Milton Hydro, with just over half (52%) saying it was the "right amount/enough". However, more than one-in-three (35%) felt it was "too much".

Figure 26: Volume of Information



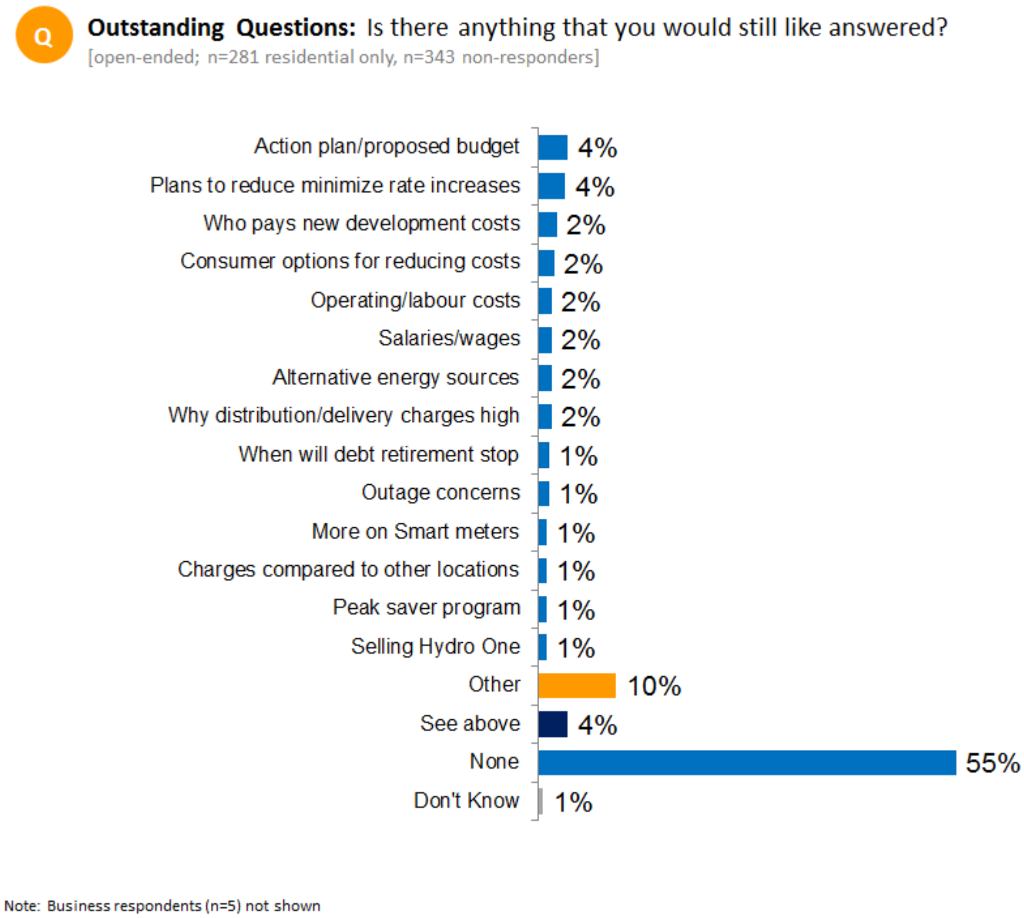
Among those who gave feedback on the content covered in the online survey (n=326), half (51%) said there was no missing content that they would have liked to have seen included. Any specific content suggestions were mentioned by fewer than five percent of those who provided a response, suggesting that there were no key informational gaps in the content provided.

Figure 27: Content Covered



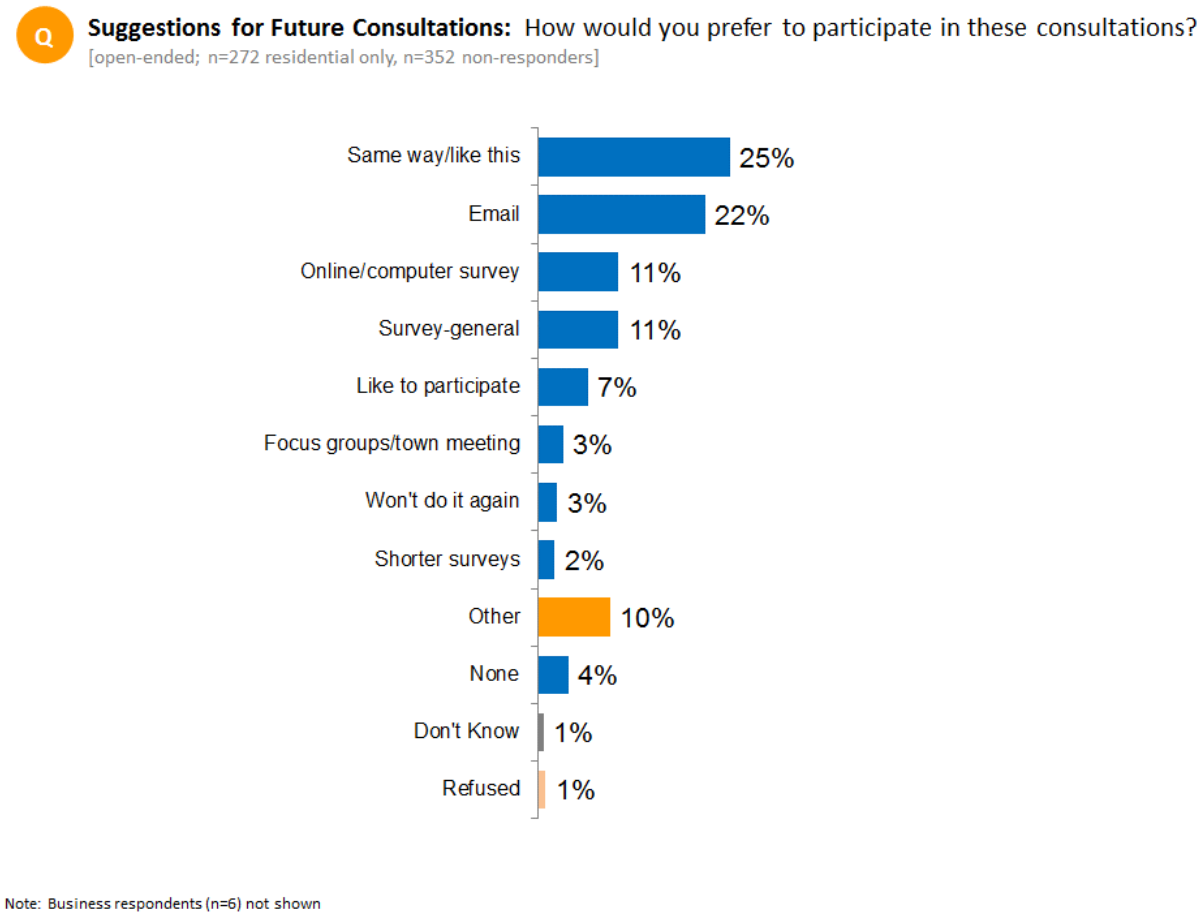
Similarly, among those who gave input regarding outstanding questions (n=281), more than half (55%) said there is nothing that they would still like answered. Again, any specific questions were mentioned by fewer than five percent of those who provided a response.

Figure 28: Outstanding Questions



When it comes to suggestions for future consultation, 272 of the 624 respondents provided a response. One quarter (25%) said they would like these consultations to be conducted in the "same way/like this", while slightly fewer (22%) would prefer "email".

Figure 29: Suggestions for Future Consultation



Customer Telephone Surveys

Telephone Surveys
among Residential and GS customers

PURPOSE: To obtain statistically significant quantitative customer feedback on the investment plan and rate impact and assess reaction to customer opinions obtained from the previous research phases

Summary

The following summary highlights the key findings from telephone surveys of 504 Milton Hydro residential customers and 120 General Service <50 kW customers:

Familiarity and Satisfaction

- Less than half of both residential (44%) and General Service (48%) customers are familiar with their local distribution system.
- A majority of residential (86%) and General Service (83%) customers are satisfied with the job Milton Hydro is doing.
- The two most common suggested service improvements are shared by both residential and General Service customers. The most commonly cited improvement was a reduction of rates (RS: 32%; GS: 18%), followed by a reduction of outages (RS: 6%; GS: 11%).

Electricity Bill Knowledge Summary

- Residential (31%) and General Service (27%) customers show similar levels of familiarity in terms of how much of their monthly bill is allocated to Milton Hydro.
- General Service customers of medium-high consumption level are much more familiar (50%) than any other group.

System Reliability

Ice Storm of December 2013

- Half of both residential (50%) and General Service (54%) customers were affected by the ice storm of 2013.
- Seven-in-ten (69%) residential customers and three-in-five (57%) General Service customers were satisfied with Milton Hydro's response to the ice storm.
- Residential and General Service are of the same opinion as to how service could have been improved during the ice storm, however they prioritize differently. The two most commonly suggested improvements were better communication (RS: 8%; GS: 4%) and faster response time (RS: 4%; GS: 9%).

Power Service Interruptions

- In the 12 months prior 36% of residential customers and 48% of General Service customers did not experience a power outage unrelated to extreme weather. Fewer than half (43%) of residential customers and even fewer (28%) General Service customers experienced one to three power outages.

- Customers who experienced a power outage were asked to indicate the duration of the most recent one. The majority of both residential (63%) and General Service (65%) customers experienced an outage lasting less than one hour.
- The majority of both residential (66%) and General Service (61%) customers found the most recent power outage to be a *minor inconvenience.*
- In terms of investment devoted to addressing the number and duration of outages, residential and General Service customers are most in favour of spending in order to *maintain* the current level (54% of residential customers and 46% of General Service customers); half (52%) of both groups feel this way in regards to spending to maintain the current duration of outages.

System Challenges & Priorities

Investment in Aging Infrastructure

- More than half of residential (56%) and General Service (53%) customers feel that Milton Hydro should invest what it takes to replace the system's aging infrastructure, even if that results in an increase to their monthly bills.

Replacement of Aging Equipment

- Customers were explained the run-to-failure approach to investing in equipment and asked whether they think non-critical infrastructure should be replaced before or after it breaks down. The majority of both residential (70%) and General Service (68%) customers feel that equipment should be replaced before it breaks down.

System Service

- Four-in-five residential (81%) and General Service (79%) customers feel that it is important to invest now in modernizing the grid.

Conservation and Demand Management

- After being read a brief introduction, 56% of both residential and General Service customers indicated that they are likely to participate in conservation and demand management programs

Overall Assessment of Plan

Residential Acceptance: The majority (68%) of residential customers support the rate increase, whether they support it outright (33%), or acknowledge its necessity (36%). One-quarter (25%) of residential customers are opposed.

Top 3 Reasons for Willing Acceptance	
Q: And why do you say that?	
[Asked of residential customers who outright support Milton Hydro's proposed rate increase]	
Increase not that much/affordable	46%
Necessary for infrastructure & equipment maintenance/upgrade	13%
Better/reliable service	11%

General Service Acceptance: Overall, General Service customers support the proposed rate increase to the same degree (68%) as residential customers, however the proportion that supports it outright is slightly higher (37%). Three-in-ten (28%) customers oppose the increase.

Top 3 Reasons for Willing Acceptance	
Q: And why do you say that?	
[Asked of GS customers who outright support Milton Hydro's proposed rate increase]	
Affordable	30%
Necessary	30%
Fine for better service	14%

Methodology

INNOVATIVE conducted two customer surveys by telephone for Milton Hydro:

1. A residential customer survey conducted among **504 customers** between June 17th and June 20th, 2015.
2. A General Service customer (GS < 50 kW) survey conducted among **120 customers** between June 18th and June 26th, 2015.

Participants were randomly selected from customer lists provided by Milton Hydro (26,733 residential records and 2,142 General Service records).

- A sample of 504 residential customers is considered accurate to within ±4.4 percentage points, 19 times out of 20.
- A sample of 120 General Service customers is considered accurate to within ±8.9 percentage points, 19 times out of 20.

The margin of error in both surveys will be larger within each sub-grouping of the samples.

Questionnaire Design

The questionnaires were designed to simulate the journey that participants in the Workbook-led Consultation Sessions and Online Survey experienced. This included a combination of educating the customers, having customers reflect on their personal experience with their distribution system, and having them make value judgments on trade-offs between system reliability and bill impact.

Wording of questions differed slightly between the Residential and General Service surveys – for example, in the preambles the size of monthly bills differed between residential and general service customers – but otherwise remained generally consistent.

The average survey ran at approximately 10 minutes.

Fielding the Survey

Residential (RS) Customer Survey:

For the purposes of executing the residential survey, Milton Hydro provided INNOVATIVE with a confidential list containing 26,733 of their residential customers' contact information.

The contact list included only residential customers with residential landline contact information on file and who had been a customer of Milton Hydro since at least January 1, 2014. The information contained in the contact list included customer name, home telephone number, home address, service area, and total annual usage between January 1 and December 31, 2014.

Only one customer per household was eligible to complete the residential survey. Survey customers were screened to certify that only the resident with primary or shared responsibility for paying their Milton Hydro electricity bill was interviewed. This step was taken to ensure that surveyed customers represented the most qualified person within a household to answer questions about their electricity bill and Milton Hydro's proposed rate increase.

Before retiring any randomly selected telephone number from the contact list, eight attempts were made to reach a potential respondent for each unique telephone number, or until an interviewer received a hard refusal. Each night new records were released from the contact list to replace completed or retired numbers.

Milton Hydro's residential customers were contacted at their home by telephone between 4pm and 9pm on weekdays; between 10am and 8pm on Saturdays; and between 11am and 8pm on Sundays.

General Service (GS) Customer Survey:

The sample for the General Service (<50kW) survey consisted of 2,142 customers in a confidential list provided to INNOVATIVE by Milton Hydro. General Service customers were screened to ensure they were in charge of managing the electricity bill at their organization.

General Service customers were contacted on weekdays between 9am to 4pm.

All fieldwork was conducted using INNOVATIVE's computer-assisted telephone interviewing (CATI) system.

Sample Design

The two surveys followed a stratified random sampling methodology. This is a method of sampling that involves the division of a population into smaller groups known as strata. In stratified random sampling, the strata are formed based on members' shared attributes or characteristics (in this case, customer service area or electricity usage). A random sample from each stratum is taken in a number proportional to the stratum's size when compared to the customer population. These subsets of the strata are then pooled to form a random sample.

In both surveys, residential and General Service customers were divided into quartiles based on annual electricity usage to ensure the sample had a proportionate mix of customers from low, medium-low, medium-high, and high electricity usage households.

Residential and General Service Sample Design:

Milton Hydro customers were divided into quartiles based on annual electricity usage. The following table illustrates the segmentation of the residential and general service customer survey samples by usage quartile. While every attempt was made to achieve the 200 target for General Service completes, there simply was not enough sample available in this customer rate class to do so.

Customer Type		Total Sample	Low	Medium-Low	Medium-High	High
Residential	Target	500	125	125	125	125
	Actual	504	126	126	125	127
	Difference	+4	+1	+1	0	+2
General Service	Target	200	50	50	50	50
	Actual	120	31	30	30	29
	Difference	-80	-19	-20	-20	-21

Sample Weights

Weights have not been applied to either the residential or General Service data as the stratified random samples are accurate representations of Milton Hydro's actual customer base composition according to consumption level.

Financial Flexibility

One measure noted throughout this report is "financial flexibility", also referred to as "financial strain". This information was captured with the reasoning that the degree of financial impact a respondent's electricity bill has on their monthly household/organization's finances may influence some of their preferences; that is, on some topics customers' answers may differ depending on their financial strain. Such differences have been noted throughout the report.

Financial strain was determined by agreement with a customer input statement which indicated that the cost of their electricity bill has a major impact and requires customers to do without – or put off – other investments or spending priorities. Customers who agreed with this statement (responded *strongly agree* or *somewhat agree*) were classified as financially strained. This measure was included in a cross-tabulation of the survey results.

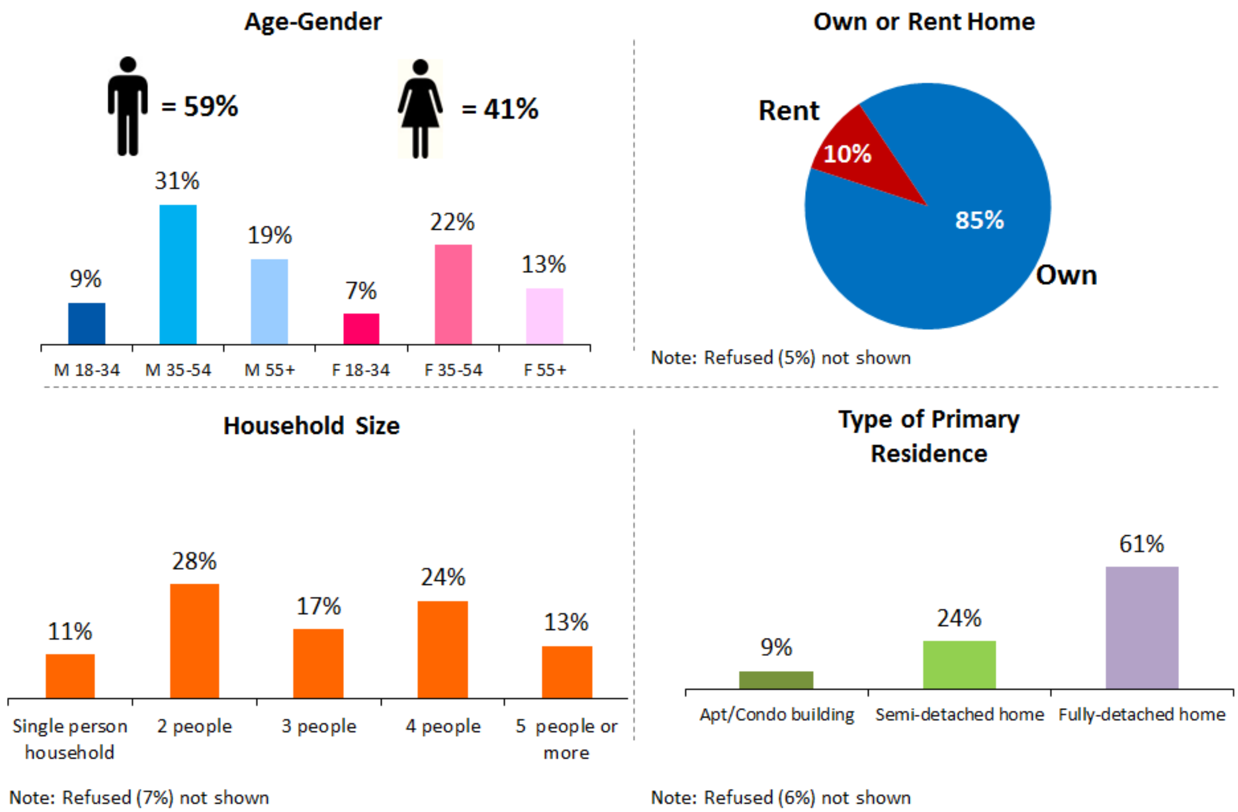
Among residential customers, we found that 57% of households (n=288) are under some financial strain due to their monthly electricity bill, while 37% are not (n=185). Looking at General Service customers, 64% (n=77) report financial strain, while 33% (n=39) are not financially strained due to their electricity bill.

NOTE: Throughout this section of the report, sums (e.g. "very well" + "somewhat well") are added before rounding numbers.

Demographic Profiles

The following details the demographic characteristics of customers who completed the Residential Ratepayer telephone survey [n=504].

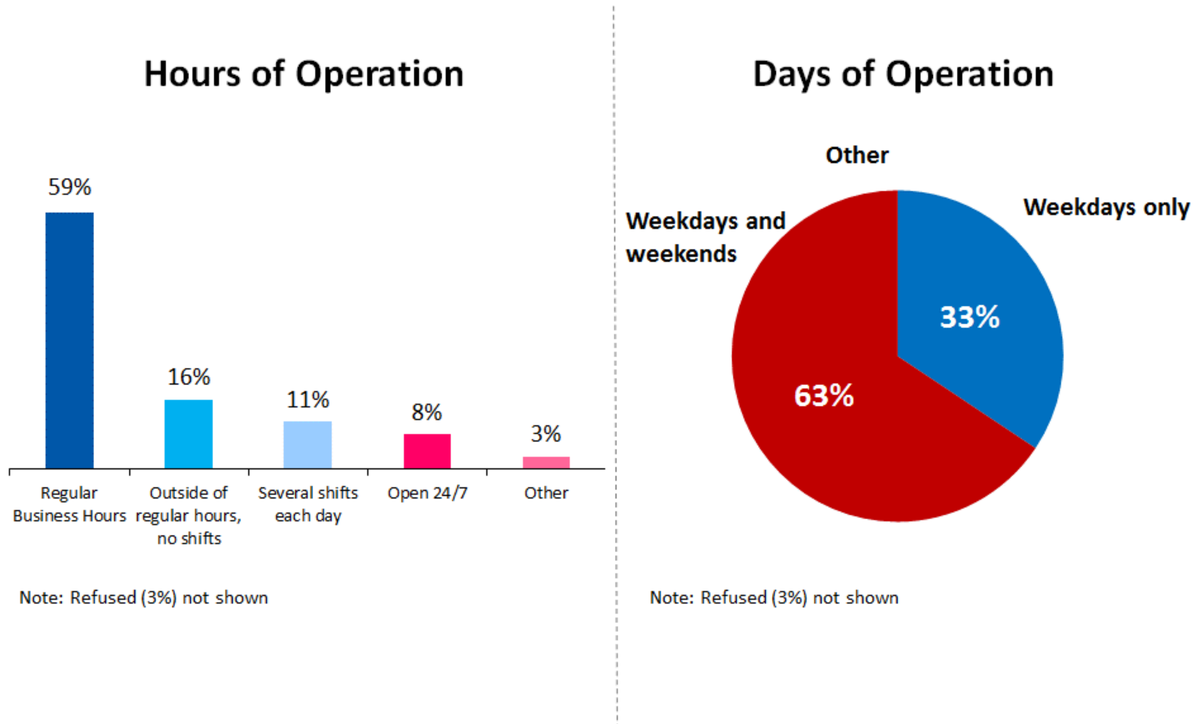
Figure A: Residential Customer Profile



Firmographic Profiles

Below are the firmographics of customers who completed the General Service Ratepayer telephone survey [n=120].

Figure B: GS Customer Profile



Respondent Feedback

Familiarity and Satisfaction

This section of the workbook explores familiarity and experience with the local distribution system, and satisfaction with Milton Hydro in running that system. The results for residential customers are presented first, followed by General Service customers.

Familiarity and Satisfaction Summary

- Less than half of both residential (44%) and General Service (48%) customers are familiar with their local distribution system.
- A majority of residential (86%) and General Service (83%) customers are satisfied with the job Milton Hydro is doing.
- The two most common suggested improvements are shared by both residential and General Service customers. The most commonly cited improvement was a reduction of rates (RS: 32%; GS: 18%), followed by a reduction of outages (RS: 6%; GS: 11%).

Preamble for Familiarity and Satisfaction Section

Prior to answering the questions in the General Satisfaction Section of the survey, customers were presented with a preamble concerning key components of Ontario's electricity system.

The preamble read as follows:

"To start, I'd like to ask you a few questions about the electricity system …

As you may know, Ontario's electricity system has three key components: ***generation, transmission*** *and* ***distribution****.*

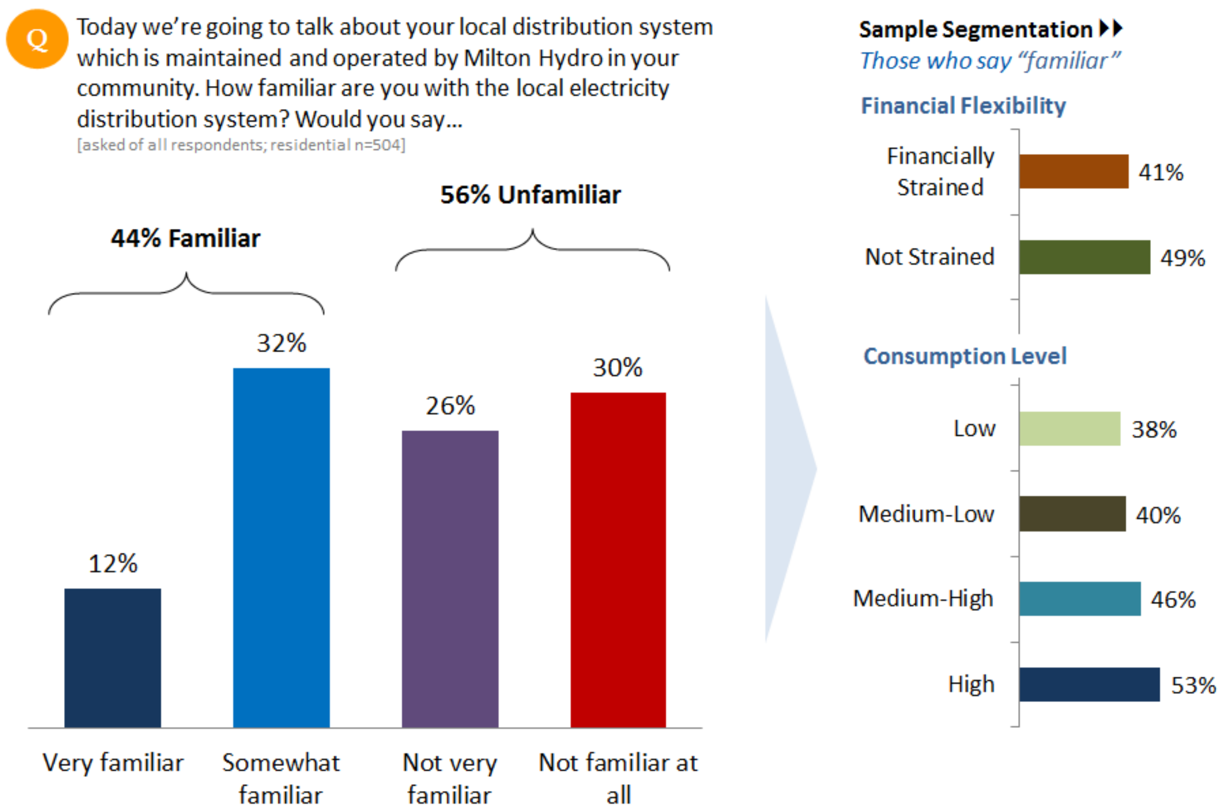
- ***Generating stations*** *convert various forms of energy into electric power;*
- ***Transmission lines*** *connect the power produced at generating stations to where it is needed across the province; and*
- ***Distribution lines*** *carry electricity to the homes and businesses in our communities."*

Familiarity with Local Electricity Distribution System

Less than half (44%) of residential customers are familiar with their local distribution system. More than one-in-ten (12%) indicated that they were *very familiar*, while three-in-ten (30%) are *not familiar at all*.

- Familiarity with the local distribution system increases with consumption level. Those who consume more are more familiar. (Low: 38% versus High: 53%).
- Though not a statistically significant difference, households that are not financially strained are directionally more familiar with the LDC than financially strained households (49% versus 41%).

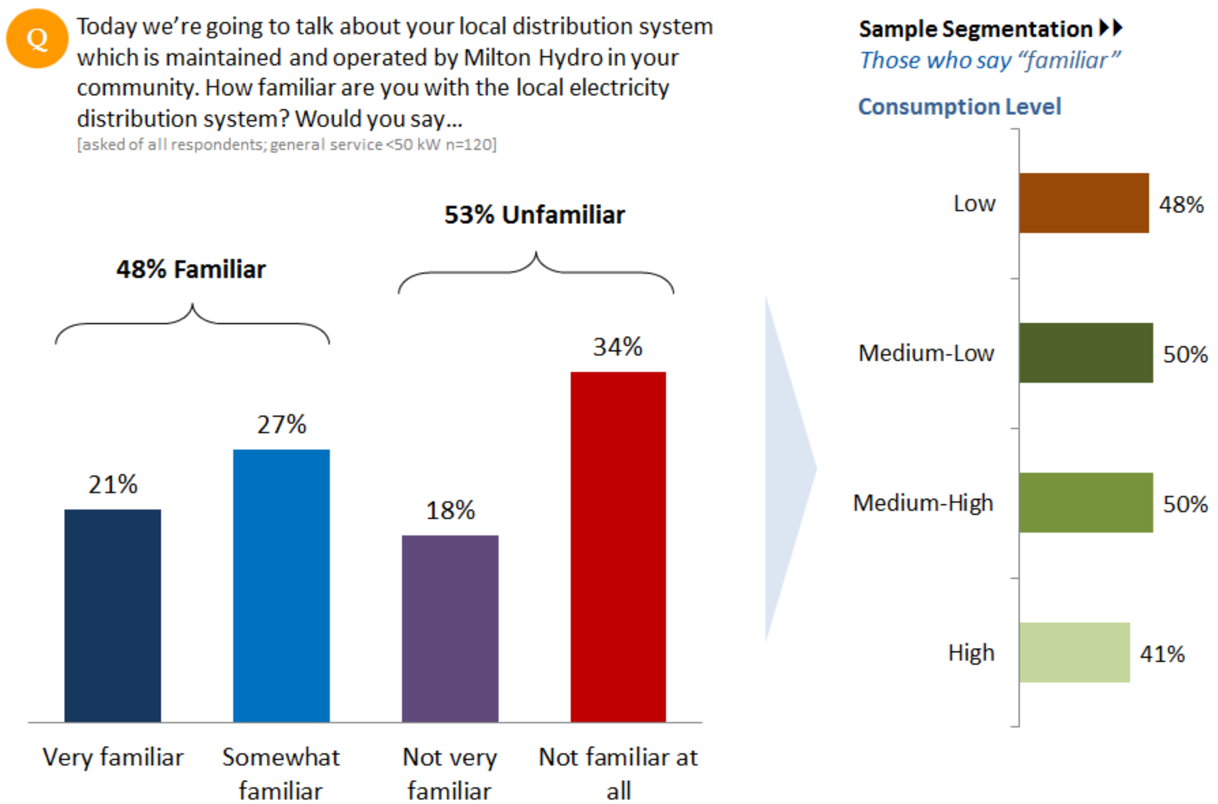
Figure RS.1: Familiarity with the Local Distribution System



General Service customers are slightly more familiar with the local distribution system than residential customers, however the number remains below half (48%). One-in-five (21%) state they are *very familiar*.

- High consumption level customers are the least familiar with the system, with two-in-five (41%) indicating they are familiar, compared to 48% or more at other levels of consumption.

Figure GS.1: Familiarity with the Local Distribution System

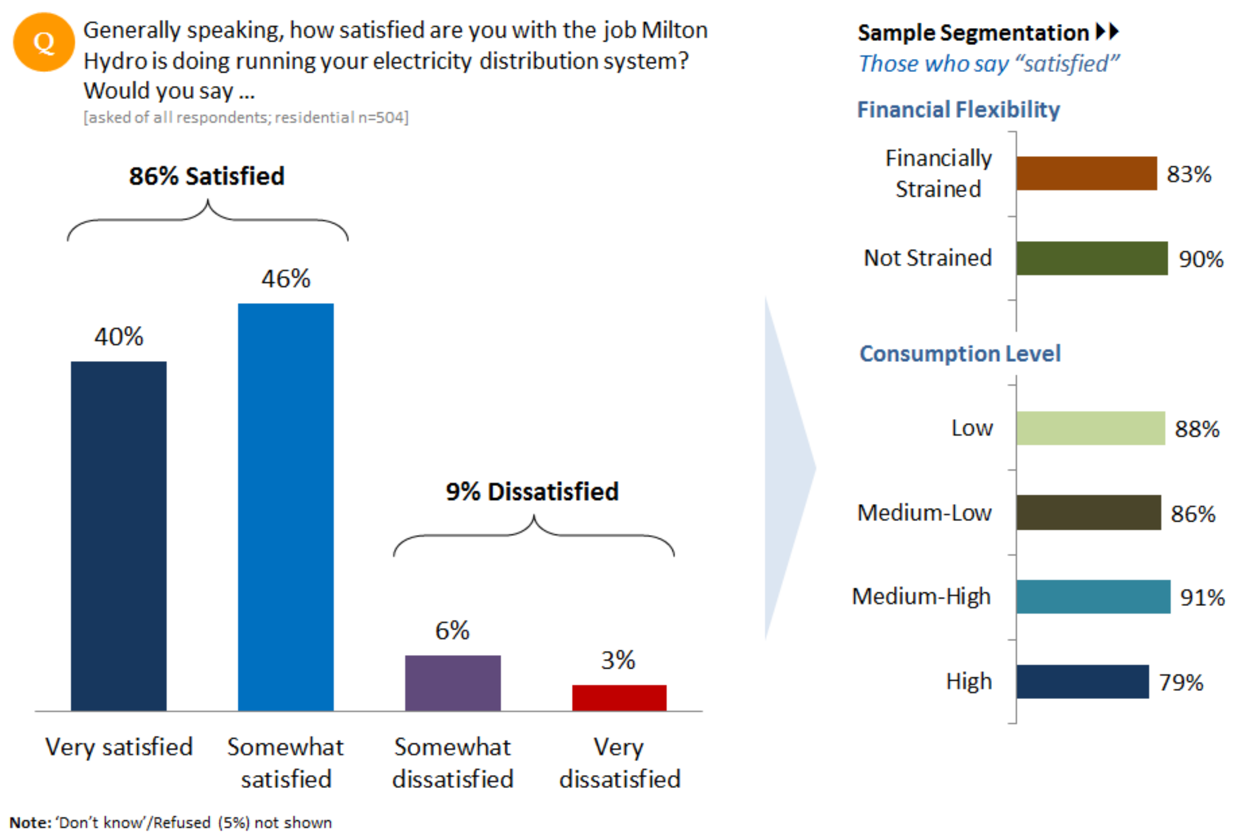


Satisfaction with Milton Hydro Running the Distribution System

The majority (86%) of customers is satisfied with Milton Hydro's management of the distribution system; two-in-five (40%) are *very satisfied*. Less than one-in-ten (9%) expressed dissatisfaction.

- Medium-high consumption level customers are the most satisfied (91%), while high consumption level customers are the least satisfied (79%).
- Satisfaction is higher among households that are not financially strained by their electricity bill (90%) than those that are strained (83%).

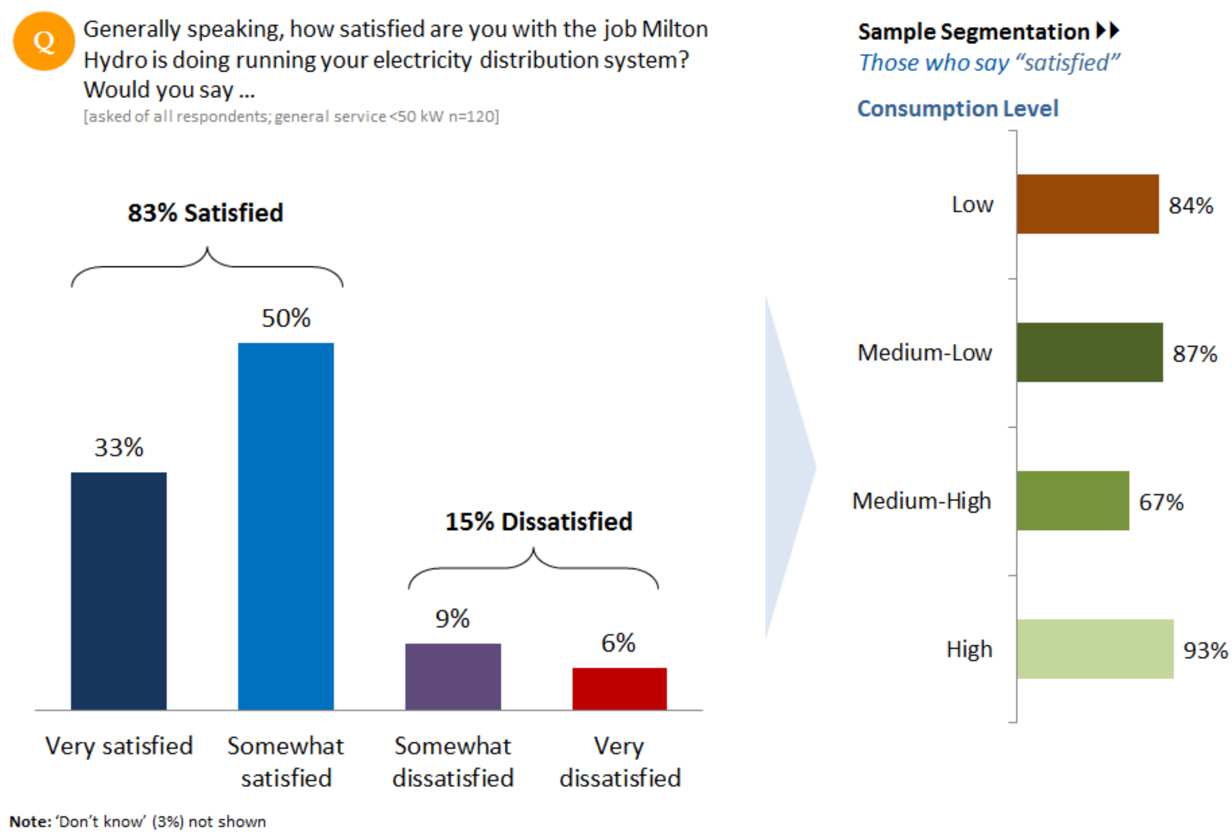
Figure RS.2: Satisfaction with Milton Hydro



General Service customers also express high levels of satisfaction (83%), with one-third (33%) indicating they are *very satisfied*. About one-in-seven (15%) GS customers indicated dissatisfaction.

- Almost all high consumption level customers are satisfied (93%); medium-high consumption level customers are the least satisfied (67%).
- Organizations operating only on weekdays are more satisfied (88%) than those operating on weekdays and weekends (82%).
- Financially strained organizations are more satisfied (84%) than unstrained organizations (77%).

Figure GS.2: Satisfaction with Milton Hydro

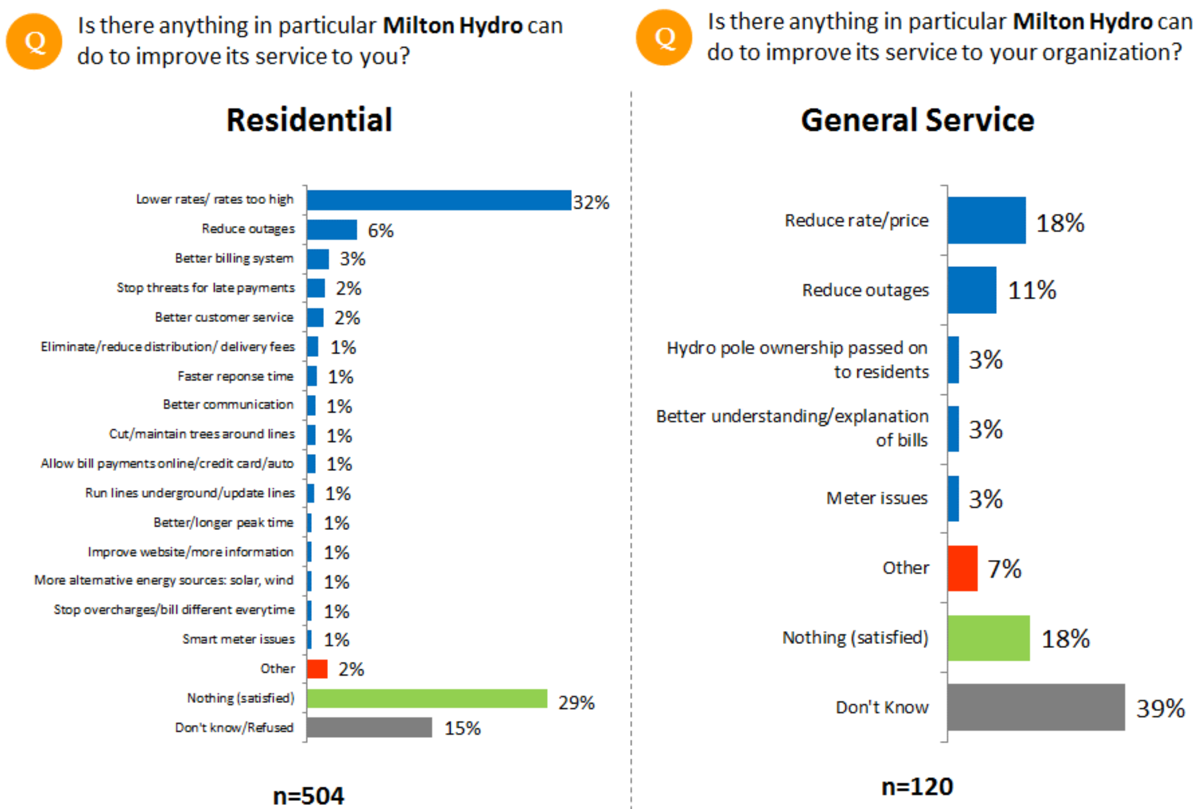


How to Improve Service

All customers were asked how Milton Hydro could improve its service. The two most common suggestions are shared by both residential and General Service customers. The most commonly cited improvement was a reduction of rates (RS: 32%; GS: 18%), followed by a reduction of outages (RS: 6%; GS: 11%).

- Three-in-ten (29%) residential customers did not have an improvement to suggest – they are satisfied. This sentiment is shared by 18% of General Service customers.
- Not surprisingly, at 38%, those from financially strained households are more likely to want lower rates than households that are not strained (22%).

Figure RS/GS.3: How to Improve Service



Electricity Bill Knowledge and Impact

This section explores residential and General Service customer perceptions and knowledge of their electricity bill. It specifically focuses on the breakdown of the bill and the extent to which customers are familiar with how much of their bill actually goes to Milton Hydro.

Electricity Bill Knowledge Summary

- Residential (31%) and General Service (27%) customers show similar levels of familiarity in terms of how much of their monthly bill is allocated to Milton Hydro.
- General Service customers of medium-high consumption level are much more familiar (50%) than any other group.

Preamble for Bill Knowledge & Impact Section

For this component of the survey, respondents were presented with a preamble concerning the breakdown of costs of an electricity bill. The two surveys provided different preambles based on targeted customers.

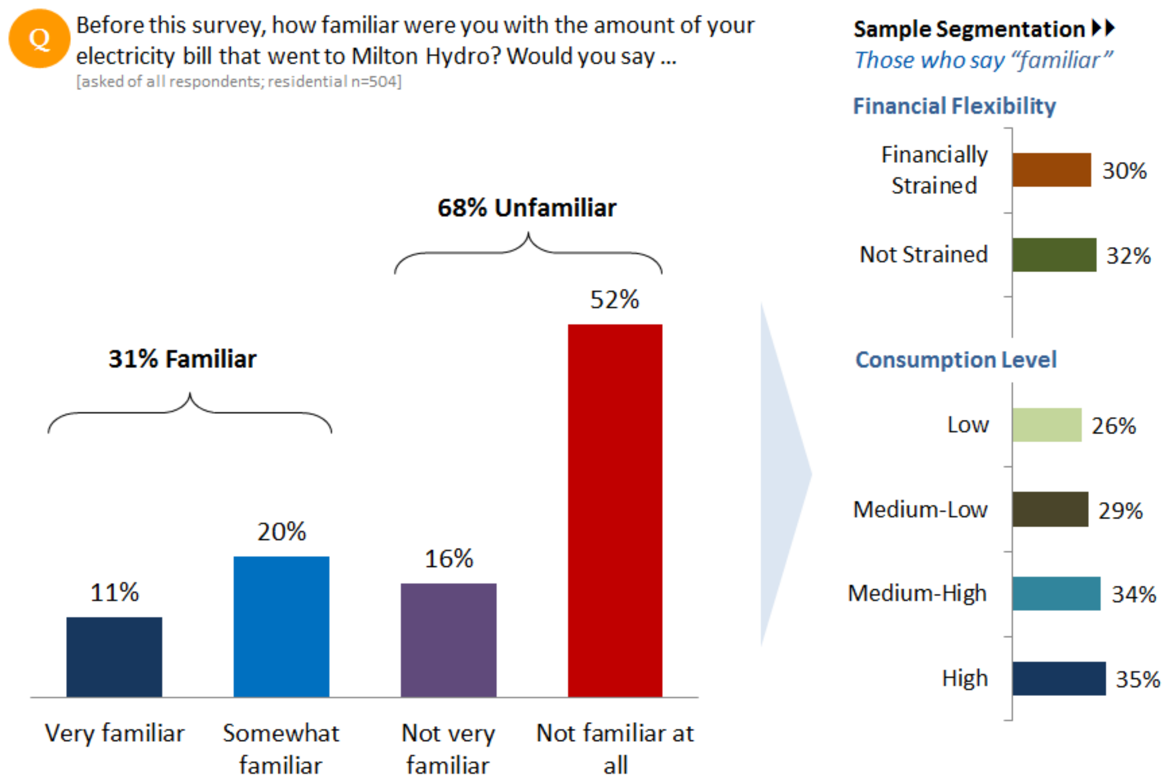
> The preamble for **residential customers** read as follows:
>
> *"I'd now like to talk with you about your electricity bill …*
>
> *While some customers pay more and other pay less, the **average residential customer pays approximately $140 a month** for electricity of **which $28 or approximately 18% goes to Milton Hydro**. The rest of the bill goes to power generation companies, transmission companies, the provincial government and regulatory agencies."*
>
> The **General Service** preamble explained it slightly differently:
>
> *"I'd now like to talk with you about your electricity bill …*
>
> *While some customers pay more and other pay less, the **average small business customer pays about $335 a month** for electricity of **which $54 or approximately 15% goes to Milton Hydro**. The rest of the bill goes to power generation companies, transmission companies, the provincial government and regulatory agencies."*

Familiarity with Share of Bill Going to Milton Hydro

Three-in-ten (31%) residential customers were familiar with how much of their monthly bill is allocated to Milton Hydro. About half (52%) were *not familiar at all*.

- Similar to familiarity with the distribution system as a whole, familiarity increases with consumption level (Low: 26% versus High: 35%)

Figure RS.4: Familiarity with Share of Bill Going to Milton Hydro

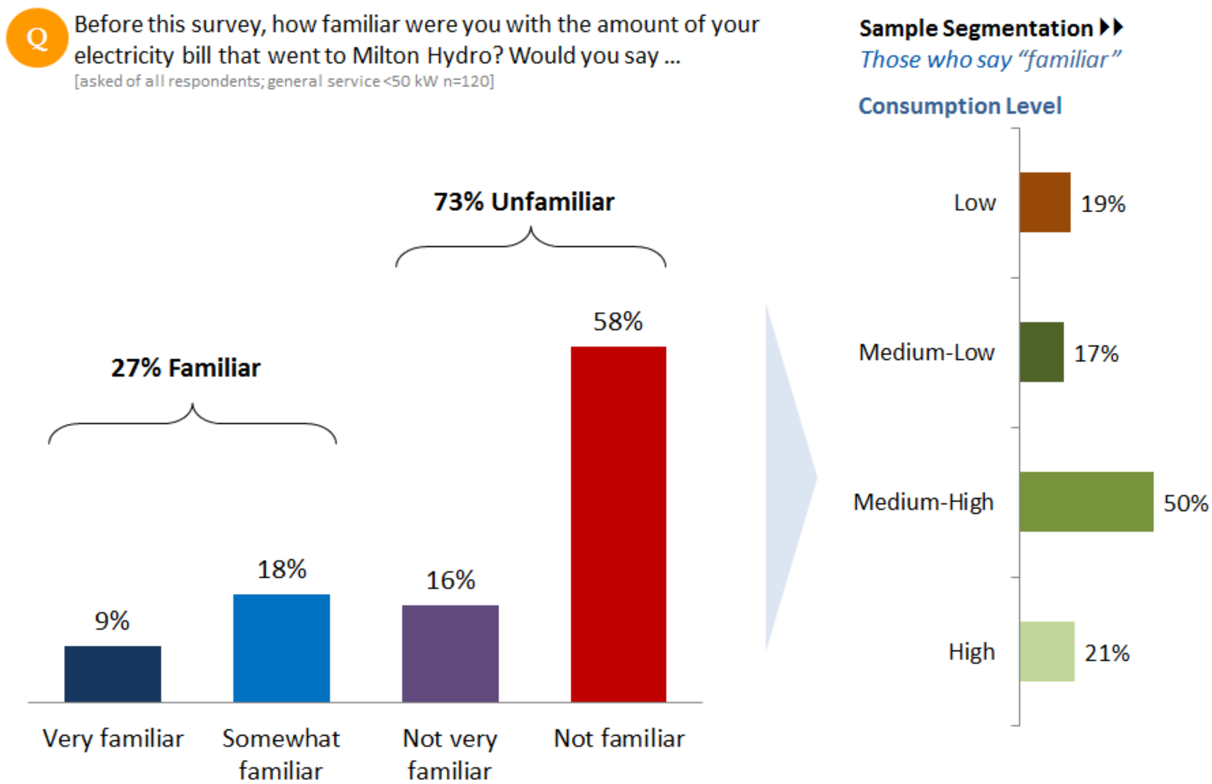


Note: 'Don't know' (1%) not shown

General Service customers are slightly less familiar with the share of their bill going to Milton Hydro, with just over one-quarter (27%) indicating familiarity.

- Medium-high consumption level General Service customers show a much higher level of familiarity than any other group; half (50%) indicated they are familiar.

Figure GS.4: Familiarity with Share of Bill Going to Milton Hydro



System Reliability

This section covers the feedback provided by customers on their experience with power service interruptions. In addition to power service interruptions under normal circumstances, customers were asked about their experience with and Milton Hydro's management of the ice storm of 2013. Customers were asked to evaluate the impact of outages to them or their organization. This section also discusses perceptions surrounding spending, and reducing the number and length of power service interruptions.

System Reliability Summary

Ice Storm of December 2013

- Half of both residential (50%) and General Service (54%) customers were affected by the ice storm of 2013.
- Seven-in-ten (69%) residential customers and three-in-five (57%) General Service customers were satisfied with Milton Hydro's response to the ice storm.
- Residential and General Service customers are of the same opinion as to how service could have been improved during the ice storm, however they prioritize differently. The two most commonly suggested improvements were better communication (RS: 8%; GS: 4%) and faster response time (RS: 4%; GS: 9%).

Power Service Interruptions

- In the 12 months prior, 36% of residential customers and 48% of General Service customers did not experience a power outage unrelated to extreme weather. About two-in-five (43%) residential customers and 28% of General Service customers experienced one to three power outages.
- Customers who experienced a power outage were asked to indicate the duration of the most recent one. The majority of both residential (63%) and General Service (65%) customers experienced an outage lasting less than one hour.
- The majority of both residential (66%) and General Service (61%) customers found the most recent power outage to be a *minor inconvenience.*
- In terms of investment devoted to addressing the number and duration of outages, residential and General Service customers prefer spending in order to *maintain* the current level (54% of residential customers and 46% of General Service customers); half (52%) of both groups feel this way in regards to maintain the current duration of outages.

Preamble for the Ice Storm of 2013

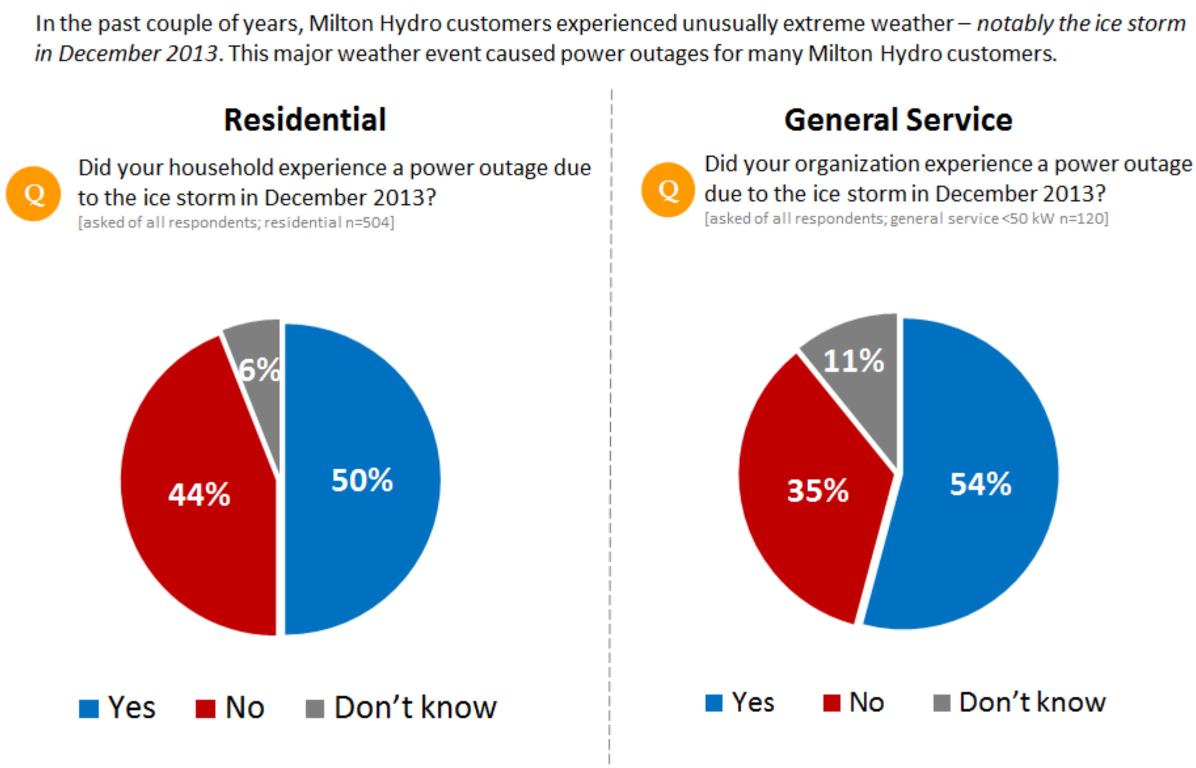
Customers were asked if they were affected by the storm and, regardless of their response, how well Milton Hydro responded to this extreme weather event. They were also asked what more could have been done to improve service. This topic was introduced by the following preamble.

> The preamble read as follows:
>
> *"In the past couple of years, Milton Hydro customers experienced unusually extreme weather – notably the ice storm in December 2013. This major weather event caused power outages for many Milton Hydro customers."*

Ice Storm of 2013

Customers were first asked whether or not they experienced an outage due to the storm. Half (50%) of residential customers were affected, as were 54% of General Service customers.

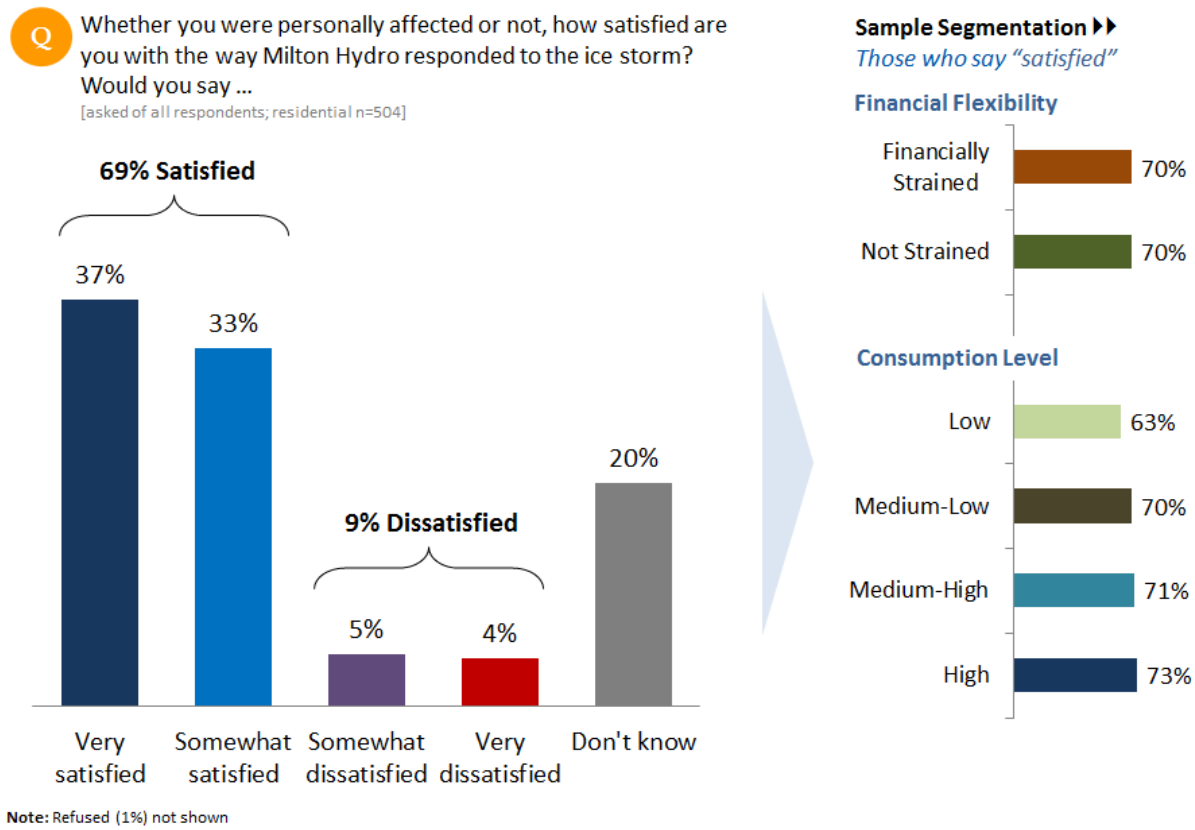
Figure RS/GS.5: Power Service Interruption Due to Ice Storm of 2013



Regardless, of whether or not their households or organizations were affected, customers were asked to rate their level of satisfaction with Milton Hydro's response to the storm. Seven-in-ten (69%) residential customers indicated satisfaction. More than one third (37%) said they were *very satisfied*.

- One-in-five (20%) customers were unable to say whether or not they were satisfied.
- Satisfaction with Milton Hydro's response increases with consumption level (Low: 63% versus High: 73%)

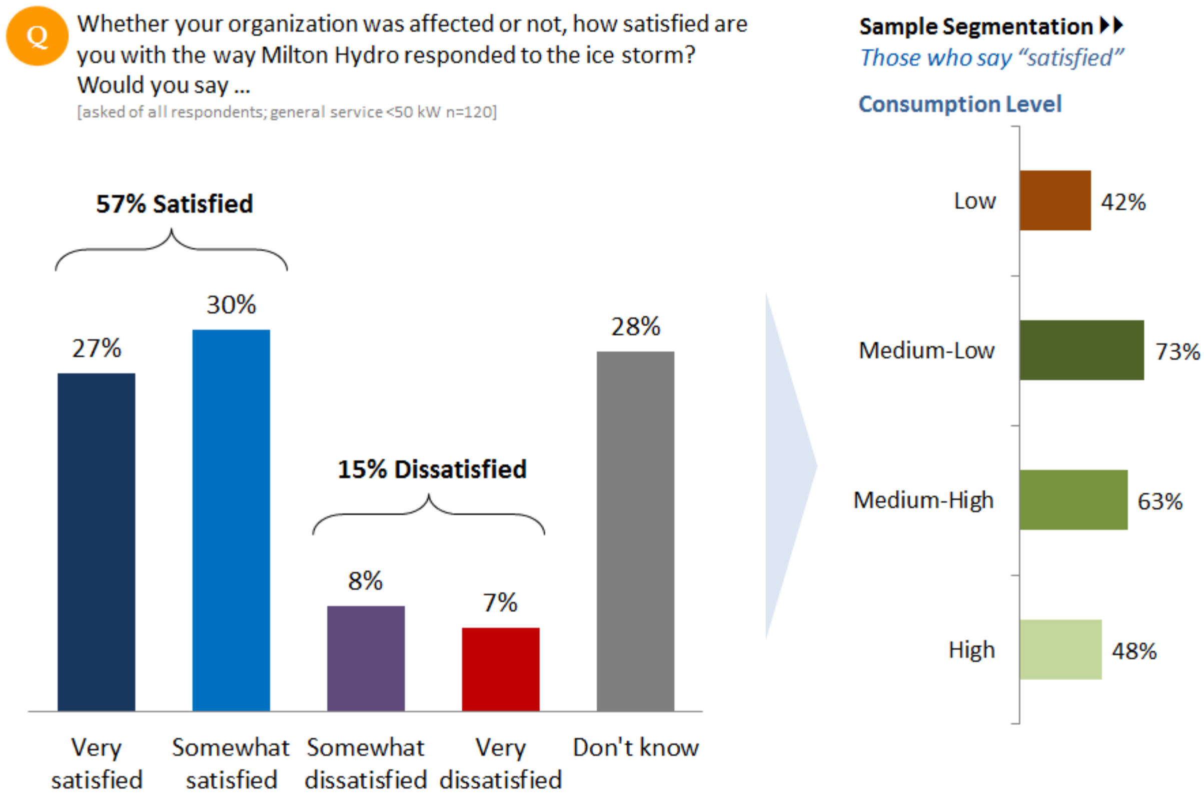
Figure RS.6: Level of Satisfaction with Response to Storm



Of the nearly six-in-ten (57%) General Service customers who were satisfied, 27% were *very satisfied* with Milton Hydro's response to the storm.

- Three-in-ten (28%) were unsure how they felt about Milton Hydro's response.
- Medium-low consumption level customers were the most satisfied (73%), while low consumption level customers were the least (42%) satisfied.

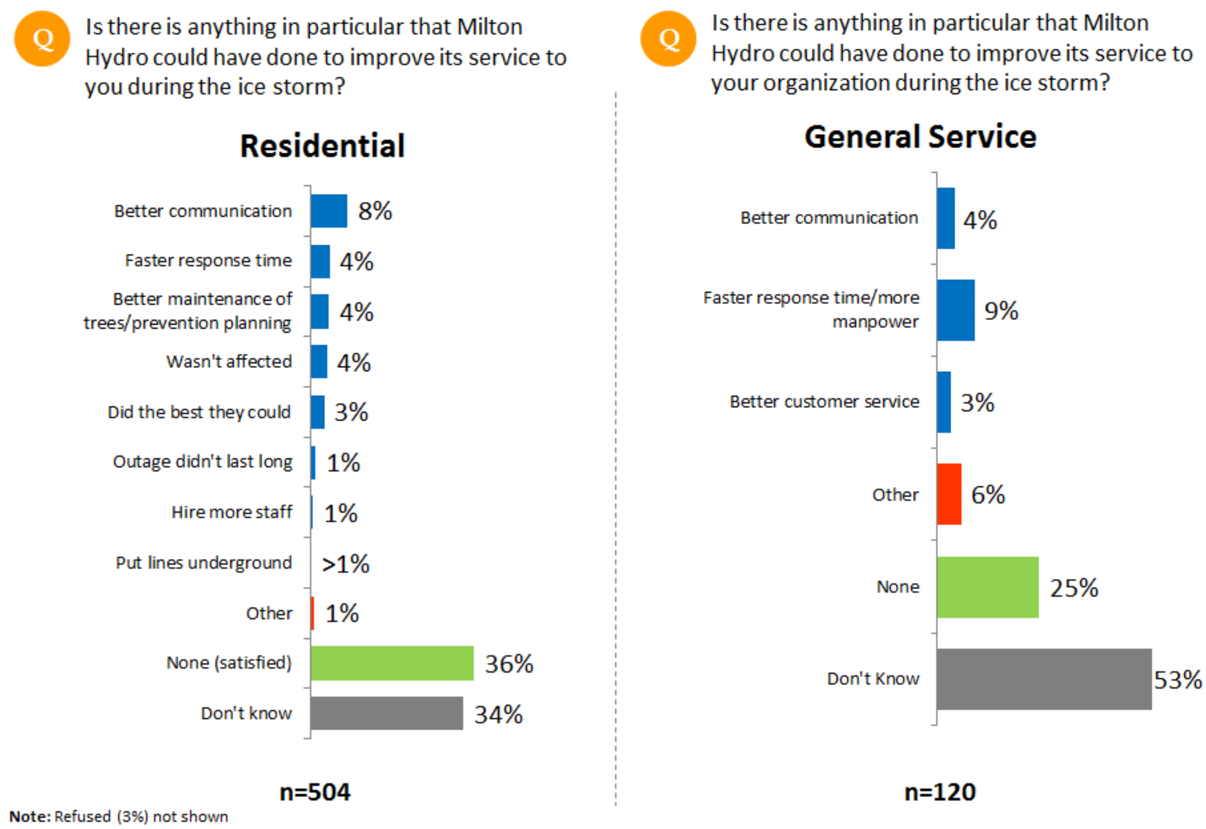
Figure GS.6: Level of Satisfaction with Response to Storm



In regards to improving service specifically during the ice storm, residential and General Service customers are once again of the same opinion. The two most common suggestions were better communication (RS: 8%; GS: 4%) and faster response time (RS: 4%; GS: 9%). For residential customers communication is more important than response time, while the reverse is true for General Service customers.

- One-third (36%) of residential customers and one-quarter (25%) of General Service customers were satisfied with the service provided by Milton Hydro during the storm and had no suggestions to offer.

Figure RS/GS.7: Improving Service during the Ice Storm



Preamble for Power Service Interruptions

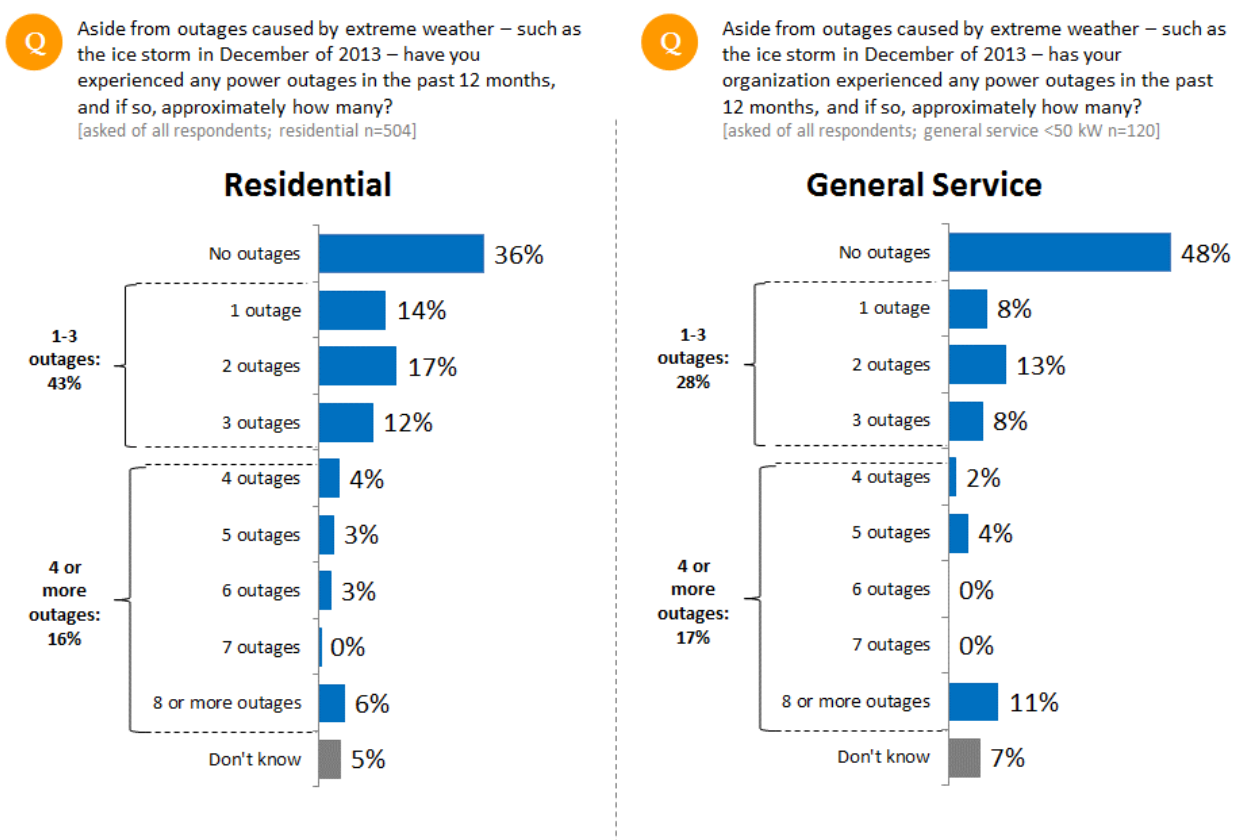
The following questions focused on how, according to the respondent, Milton Hydro should address the number of outages. A preamble concerning the average number of power interruptions was provided before the question addressing the number of outages.

> The preamble read as follows:
>
> *"Despite best efforts, no electrical distribution system can deliver perfectly reliable electricity. As a general rule, the more reliable the system, the more expensive the system is to build and maintain.*
>
> *With that said, the average **Milton Hydro** customer experiences **one** unexpected power outage per year."*

Power Service Interruptions

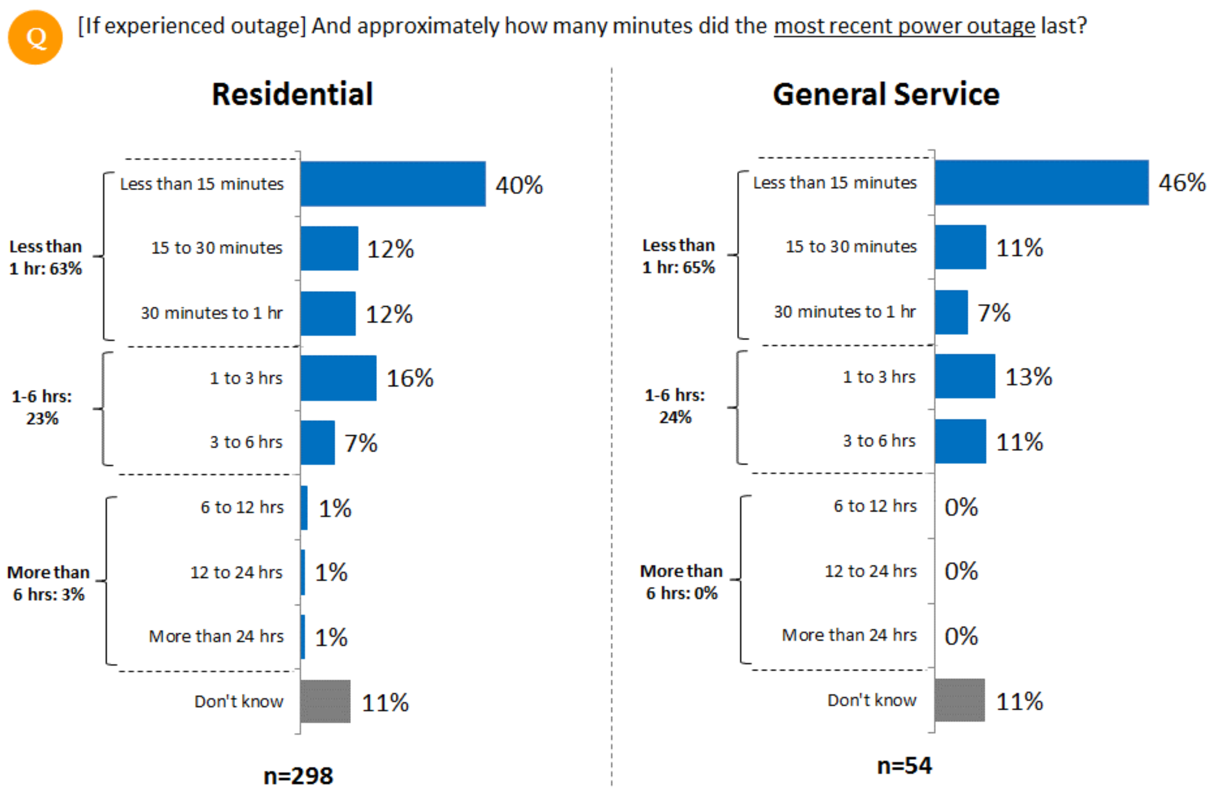
Among residential customers, in the past 12 months, one-third (36%) has not experienced any power outage and a plurality (43%) has experienced one to three power outages. One-in-seven (16%) has experienced four or more power outages. Among General Service customers, in the past 12 months, almost half (48%) have not experienced any outage, one-in-three (28%) experienced one to three outages; and 17% experienced four or more.

Figure RS/GS.8: Number of Power Outages Aside from Extreme Weather



If an outage was reported in the previous question, customers who experienced an outage were asked how long the most recent power outage lasted. The majority of both residential (63%) and General Service (65%) customers experienced an outage lasting less than one hour. In both groups outages lasting less than 15 minutes were most commonly cited (RS: 40%; GS: 46%). About one quarter of each group (RS: 26%; GS: 24%) experienced an outage lasting longer than one hour.

Figure RS/GS.9: Length of Most Recent Power Outage Aside from Extreme Weather

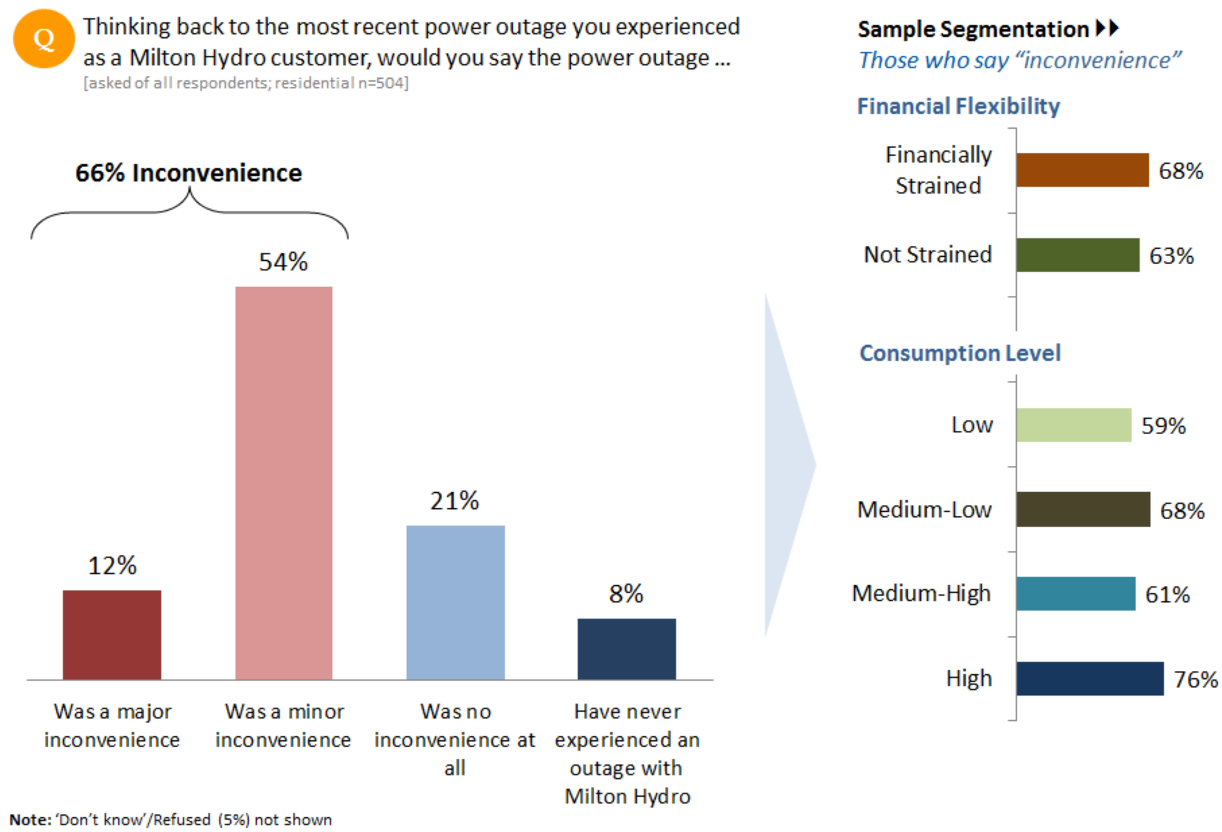


Impact of Most Recent Power Service Interruption

All customers were then asked to evaluate the inconvenience of the most recent power outage they experienced. Two-thirds (66%) of residential customers report at least a *minor inconvenience*, while 12% found their most recent outage to be a *major inconvenience*.

- Those with the highest level of consumption are most likely to report an inconvenience (76%), while low consumption level customers (59%) are the least impacted.
- Households whose electricity bill causes financial strain are more likely to report that their most recent outage was a *major* inconvenience than those who are not strained (17% versus 6%).

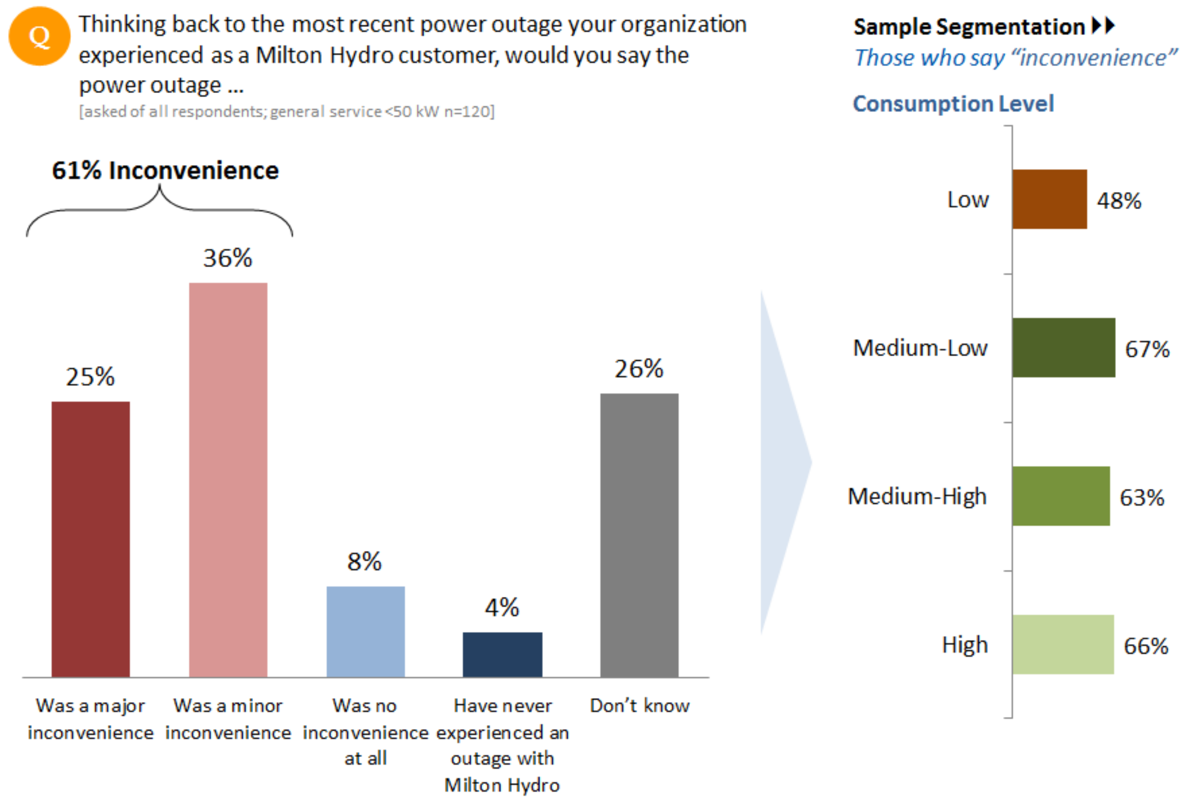
Figure RS.10: Inconvenience of Most Recent Power Outage



Six-in-ten (61%) General Service customers found the most recent outage they experienced to be an inconvenience to their organization. One-quarter (25%) indicated it was a *major inconvenience*. Another quarter (26%) was unable to determine the impact of the most recent outage.

- Less than half (48%) of low consumption level reported inconvenience.
- Power outages are most likely to be a *major* inconvenience to organizations operating outside of regular business hours (36%).

Figure GS.10: Inconvenience of Most Recent Power Outage



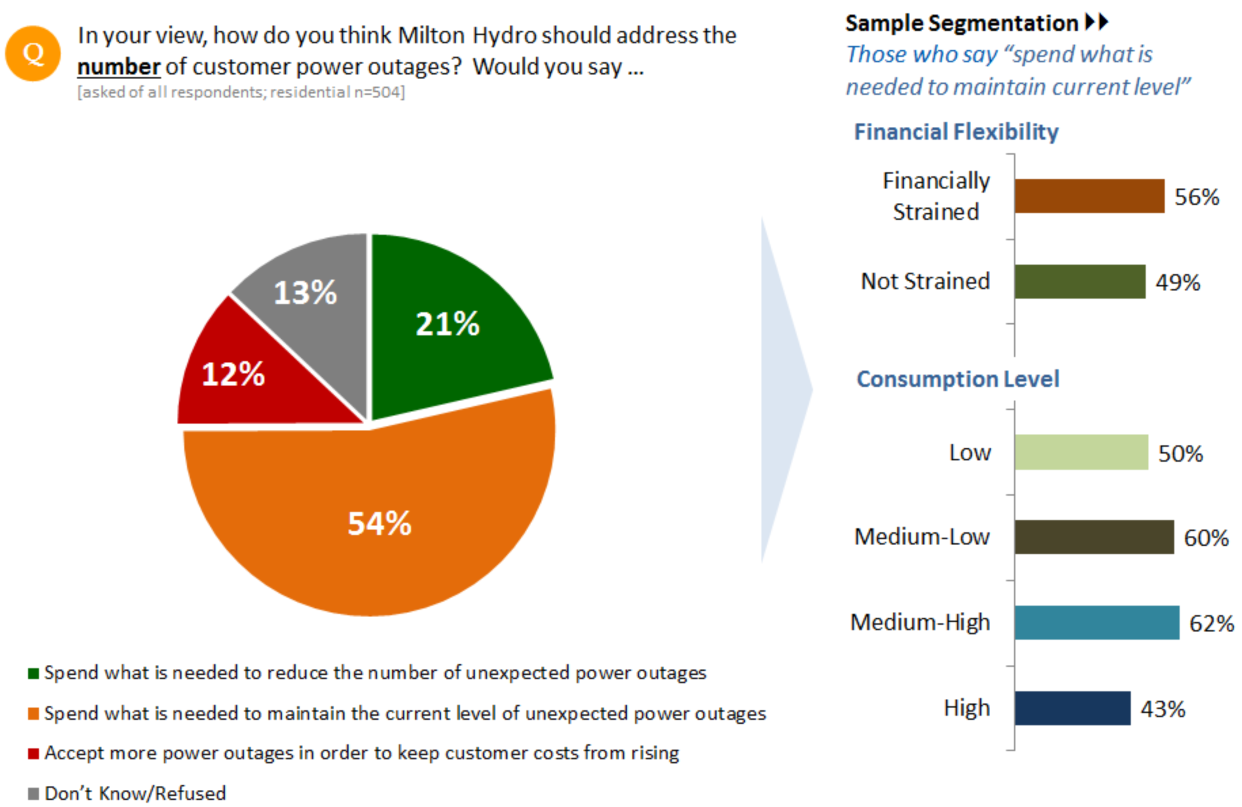
Note: Refused (1%) not shown

Addressing the Frequency of Power Service Interruptions

More than half (54%) of residential customers think Milton Hydro should spend what is needed to *maintain* the number of power outages and one-in-five (21%) think Milton Hydro should spend what is needed to *reduce* the number of power outages.

- High consumption level customers are the least in favour of spending to *maintain* (43%).
- Households under financial strain are directionally more likely to prefer a "spend to maintain" strategy than those who are not strained (56% versus 49%).

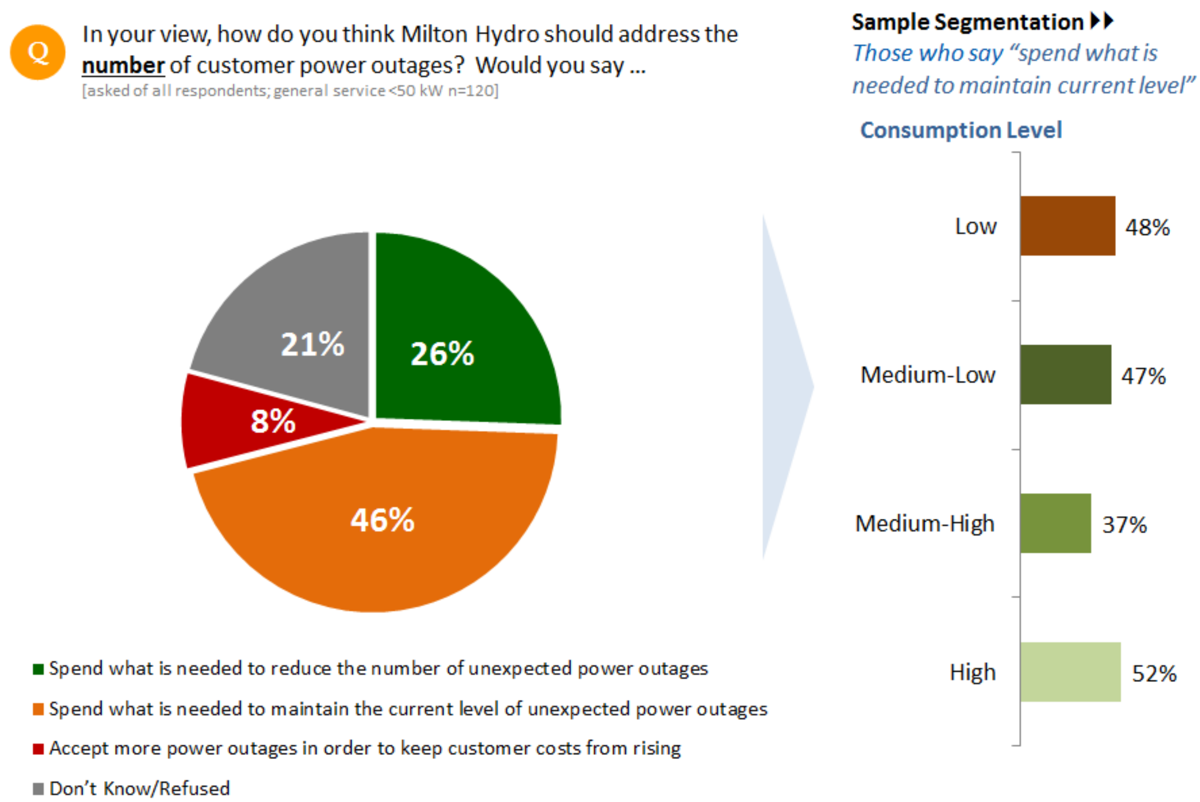
Figure RS.11: Addressing the Frequency of Service Outages



General Service customers feel similarly; a plurality (46%) would like to see Milton Hydro spend to *maintain* the current number of outages, while one-quarter (26%) support Milton Hydro spending to *reduce* the number of outages.

- Medium-high consumption level customers are least likely to support spending to *maintain* (37%).
- GS customers who indicated financial strain are less likely to support spending to *reduce* the number of unexpected power outages (23% versus 33%).

Figure GS.11: Addressing the Frequency of Service Outages

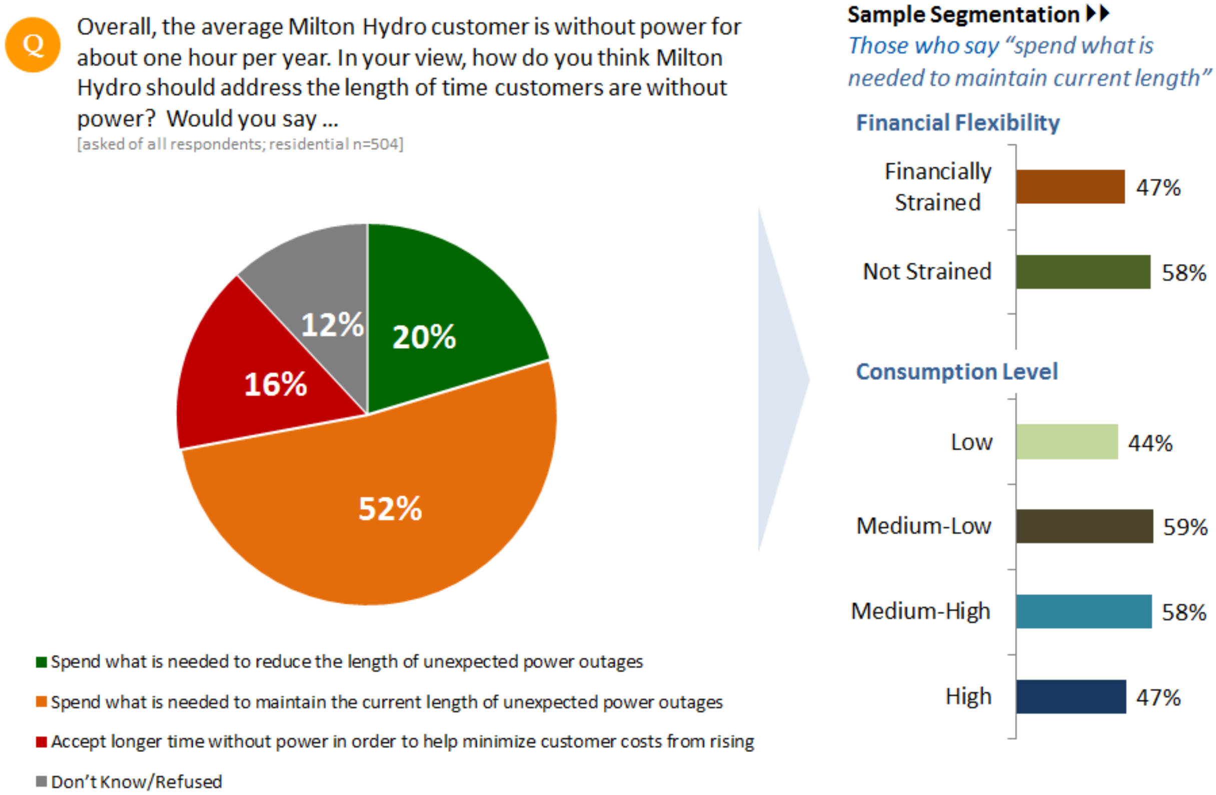


Addressing the Duration of Service Outages

Just over half (52%) of residential customers feel that Milton Hydro should spend what is needed to *maintain* the current length of unexpected power outages. One-in-five (20%) feel that spending should focus on *reducing* the length of these outages.

- Low consumption level customers are least likely to support spending to *maintain* (44%).
- Households that are not financially strained by their electricity bill are more likely to prefer a "spend to maintain" strategy than those who are strained (58% versus 47%).

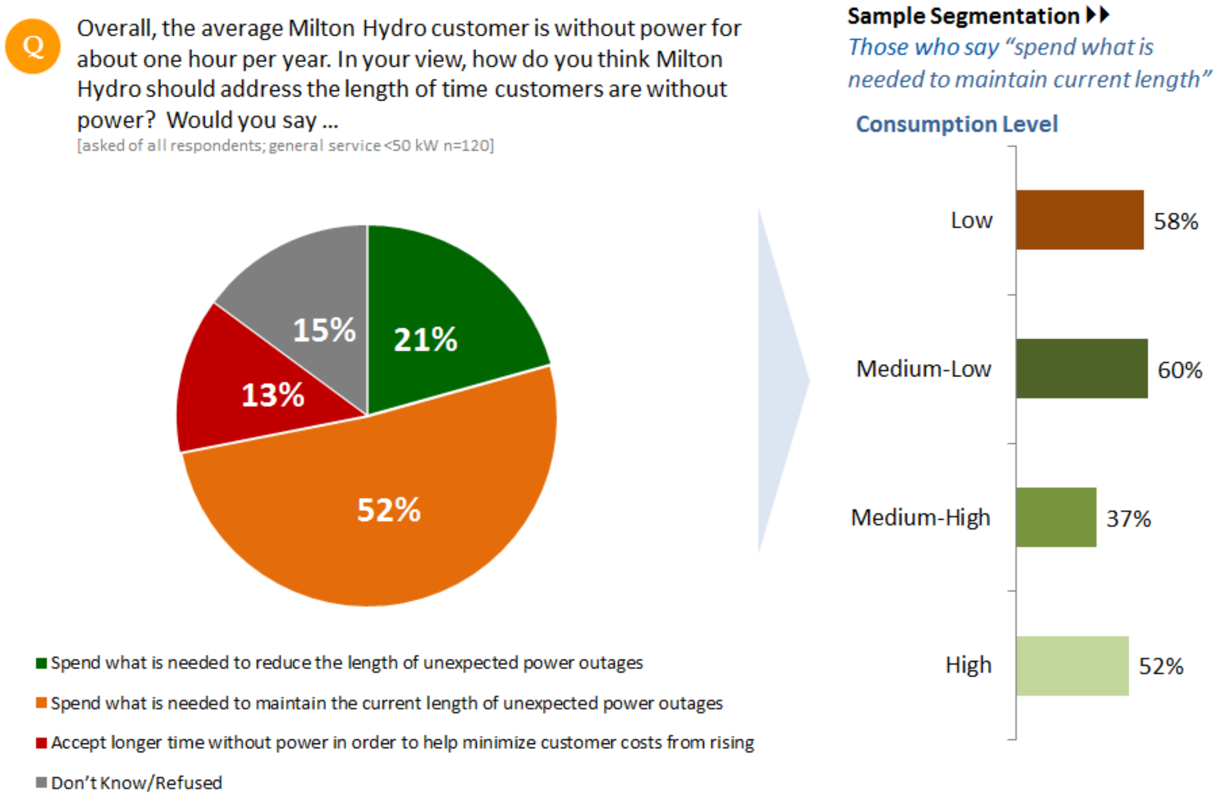
Figure RS.12: Addressing the Duration of Service Outages



Almost identical proportions of General Service customers think that Milton Hydro should spend what is needed to *maintain* (52%) or *reduce* (21%) the length of power outages.

- Medium-high consumption level customers are much less likely to support spending to maintain (37%) than the other consumption level groups.
- GS customers who are not financially strained are more likely to accept more unexpected power outages in order to keep costs from rising (18% versus 10%).

Figure GS.12: Addressing the Duration of Service Outages



System Challenges & Priorities

This section explores customers' preferences on various aspects of Milton Hydro's Capital Investment plan and OM&A spending.

System Challenges & Priorities Summary

Investment in Aging Infrastructure

- More than half of residential (56%) and General Service (53%) customers feel that Milton Hydro should invest what it takes to replace the system's aging infrastructure, even if that results in an increase to their monthly bills.

Replacement of Aging Equipment

- Customers were explained the run-to-failure approach to investing in equipment and asked whether they think non-critical infrastructure should be replaced before or after it breaks down. The majority of both residential (70%) and General Service (68%) customers feel that equipment should be replaced before it breaks down.

System Service

- Four-in-five residential (81%) and General Service (79%) customers feel that it is important to invest now in modernizing the grid.

Conservation and Demand Management

- After being read a brief introduction, 56% of both residential and General Service customers indicated that they are likely to participate in conservation and demand management programs

Preamble for System Challenges & Priorities Section

The preamble reads as follow:

"While Milton Hydro believes it has done its best to prolong the life of the assets that make up the distribution system, many of these assets are approaching the end of their useful life.

*As part of its investment plan, Milton Hydro is proposing a significant infrastructure replacement or renewal program. The estimated cost of this system renewal program is **$8.9 million** between 2016 and 2020.*

*Although this plan will allow Milton Hydro to make the necessary investments to maintain system reliability, **it will have an impact on customer bills**."*

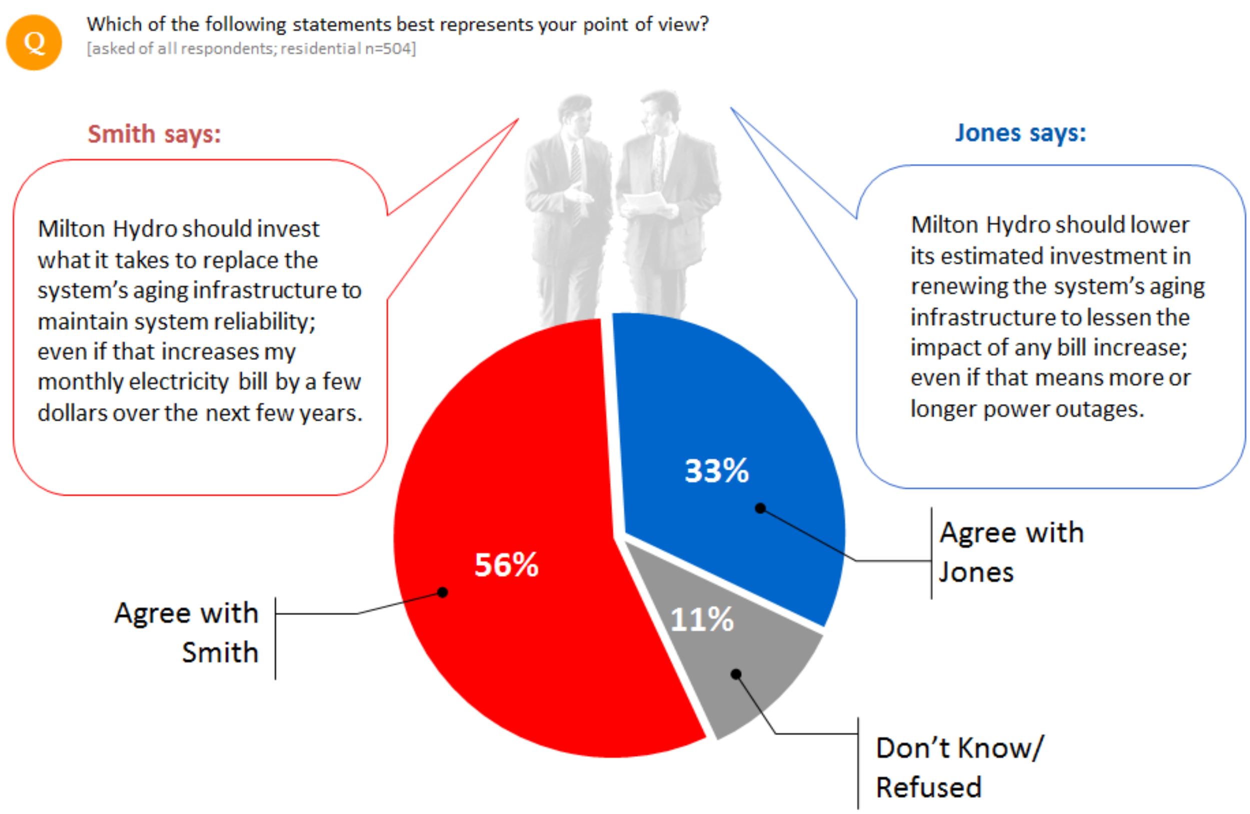
Investment in Aging Infrastructure

In regards to investment in aging infrastructure, customers were read two statements that were crafted in response to opinions expressed in earlier phases of the consultation. Customers were asked to indicate which of the statements they were more in agreement with.

More than half (56%) of residential customers feel that Milton Hydro should invest what it takes to replace the system's aging infrastructure, even if that results in an increase to their monthly bills. One-third (33%) feel that investment should be lowered to lessen the impact of any bill increase.

- Residential customers who are less financially impacted by their monthly bills are more likely to support investing what it takes to maintain system reliability than those whose households are more financially strained (74% versus 46%).

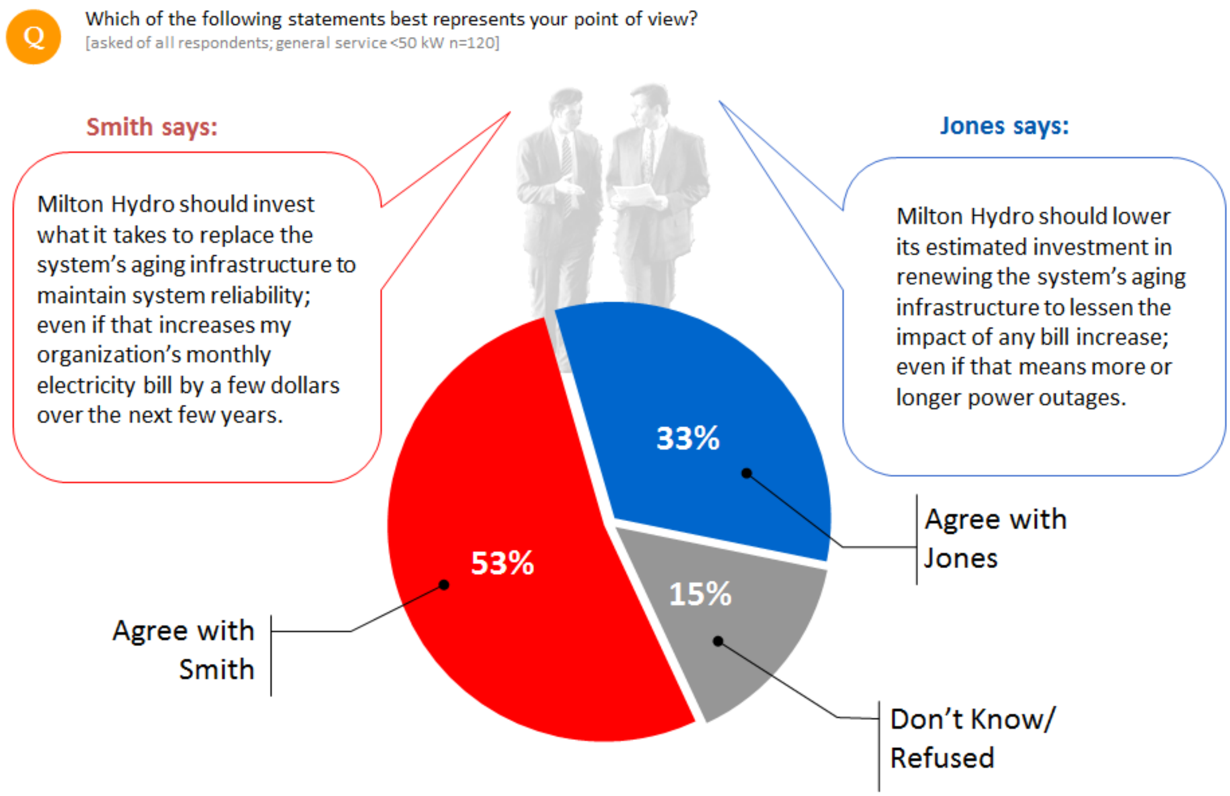
Figure RS.13: Investment in Aging Infrastructure



General Service customers show much the same proportions as residential customers. 53% feel that Milton Hydro should invest in replacing the system's aging infrastructure, while one-third (33%) feel that investment should be lower in order to lessen the impact of a bill increase.

- Less than half (47%) of financially strained GS customers support investing what is necessary to replace the aging infrastructure; as opposed to two-thirds (67%) of those not financially strained.

Figure GS.13: Investment in Aging Infrastructure

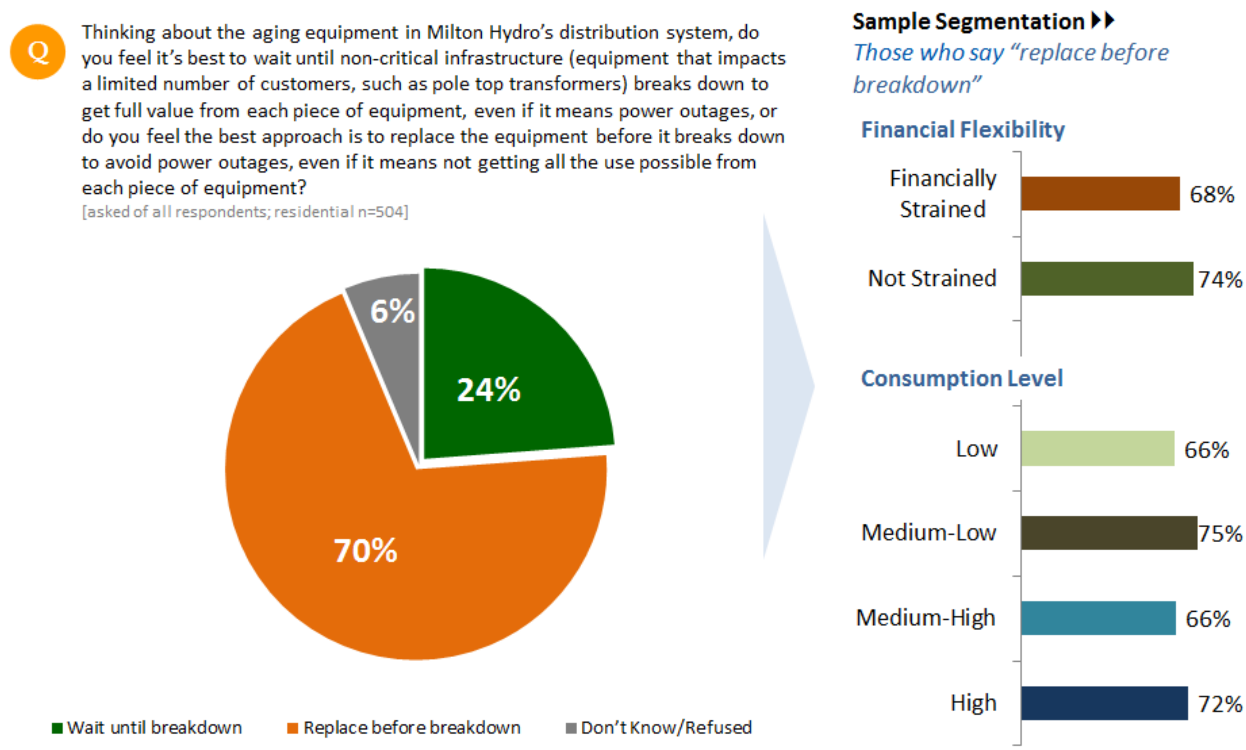


Replacement of Aging Equipment

Customers were explained the run-to-failure approach to investing in equipment and asked whether they think non-critical infrastructure should be replaced before or after it breaks down. The majority (70%) feel that equipment should be replaced before it breaks down.

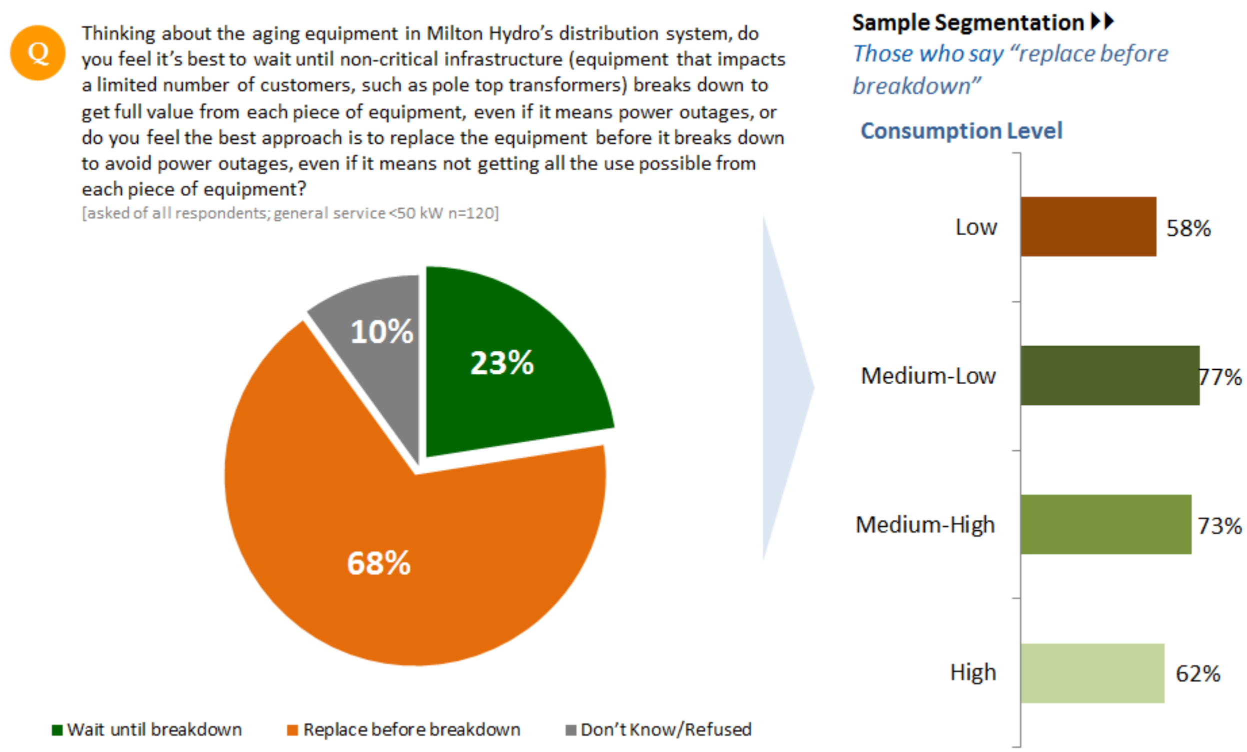
- In the scope of household size, customers from single person households are the least likely to support replacing equipment *before* it breaks down (62% versus 2-person: 80%; 3-person: 80%)
- Those from financially strained households are directionally *less* likely to support replacing equipment *before* it breaks down than those from non-strained households (68% versus 74%).

Figure RS.14: Replacement of Aging Equipment



General Service customers are in line with residential customers in supporting the replacement of aging equipment before it breaks down. Two-thirds (68%) say *replace before breakdown* while one-quarter (23%) say *wait until breakdown*.

Figure GS. 14: Replacement of Aging Equipment



Preamble for System Service

Before the questions regarding modernizing the grid, customers were read the following preamble:

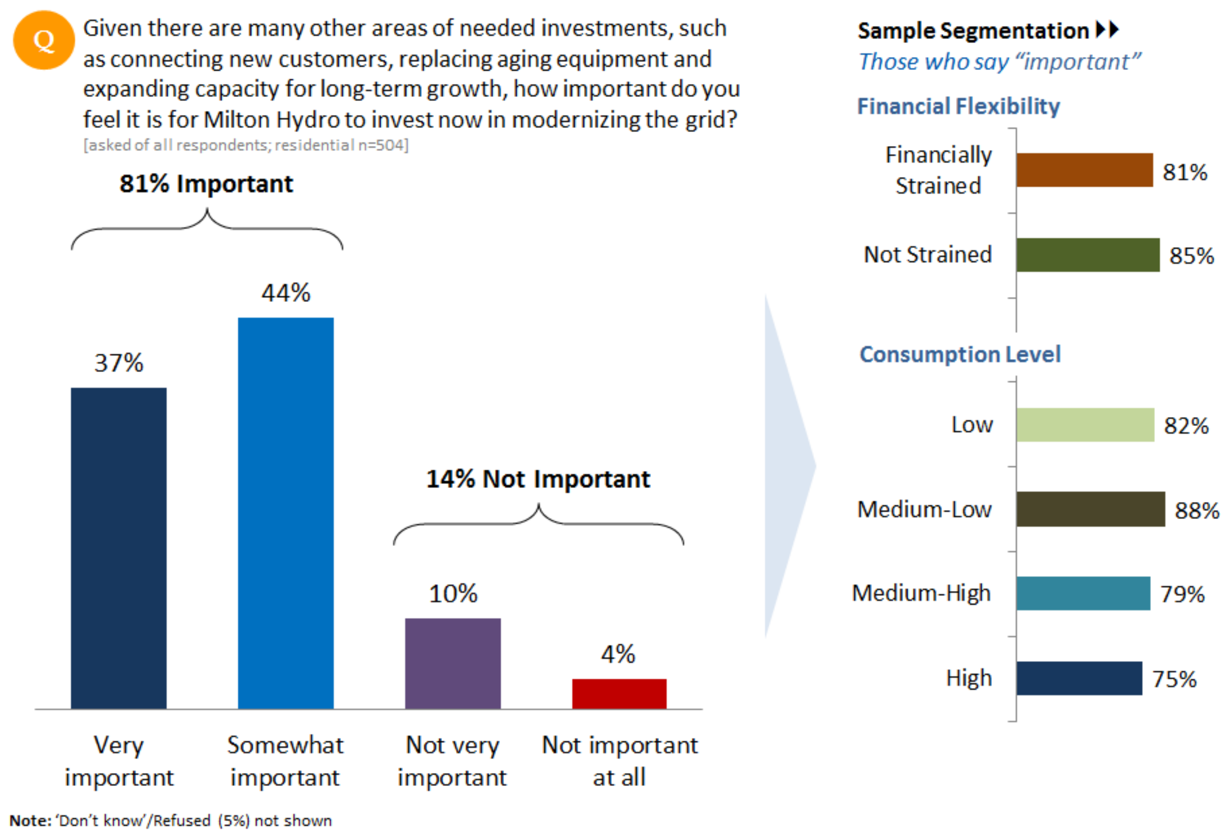
"Modernizing the grid can allow Milton Hydro to improve reliability. Investments such as automated switches may allow Milton Hydro to minimize the number of people impacted by outages and to restore electricity to most customers in a matter of seconds."

System Service

Customers were asked to determine how important they feel it is to invest now in modernizing the grid. Four-in-five (81%) residential customers acknowledge its importance; 37% feel that it is *very important*.

- At least three-quarters of every consumption level group feel modernizing the grid now is important. Medium-low consumption level customers are the most likely to feel this way (88%), while high consumption level customers are the least likely (75%).

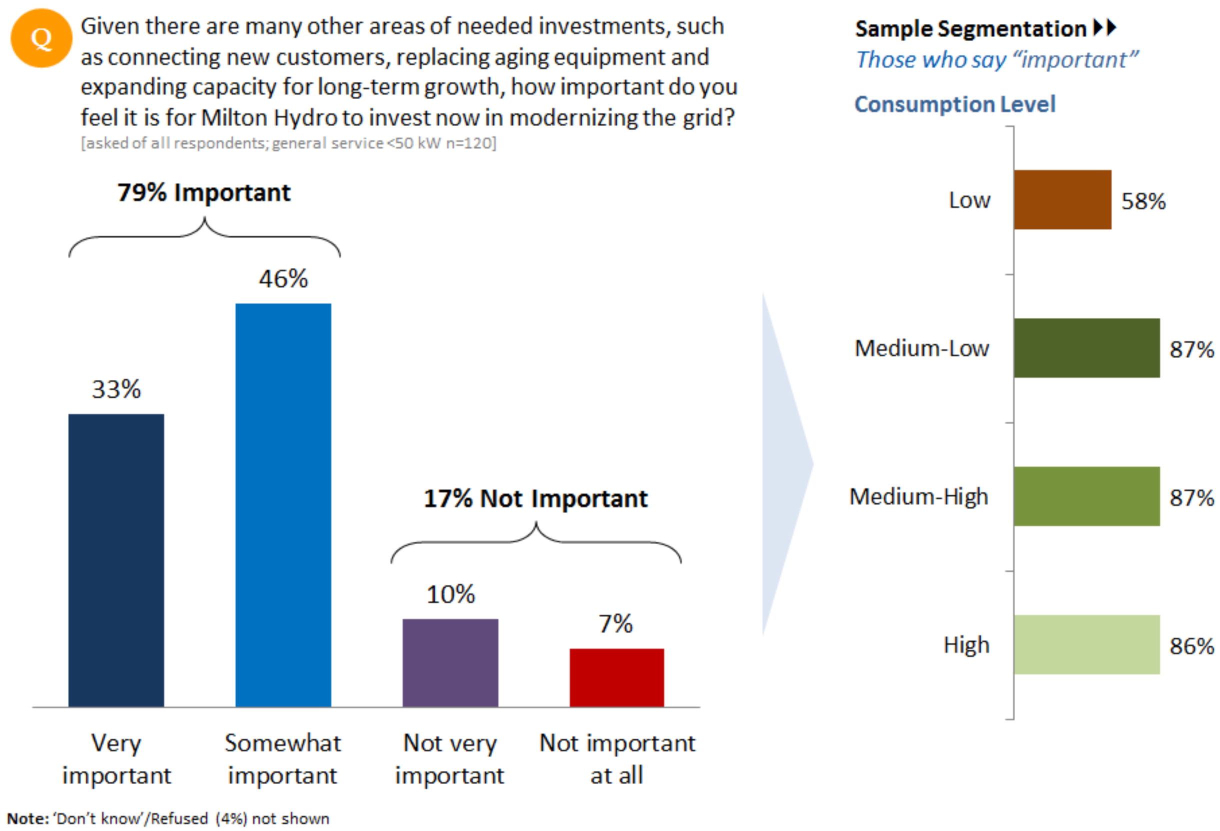
Figure RS.15: System Service



One-third (33%) of General Service customers feel modernizing the grid now is *very important* and 46% feel that it's *somewhat important*.

- Low consumption level customers are much less likely than the other groups to feel it is important to modernize the grid (58% versus 86-87%)
- A higher proportion of financially strained customers feel it is important to modernize the grid now, compared to those not financially strained (83% versus 69%).

Figure GS.15: System Service

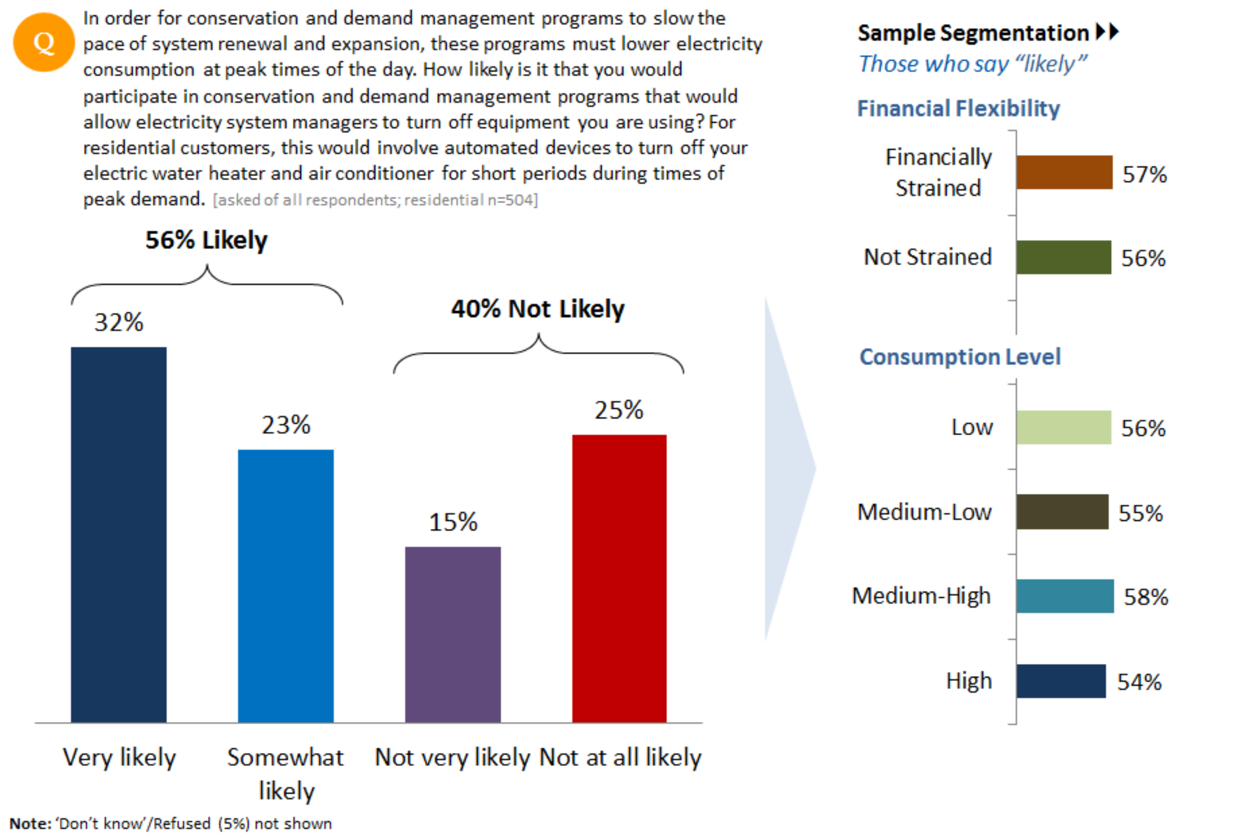


Conservation and Demand Management

Customers were given a brief explanation of conservation and demand management and asked how likely it is that they would participate in such programs. Just over half (56%) of residential customers say they are likely to participate; one-third (32%) are *very likely.*

- There is very little variation among the different consumption level groups (54% - 58%).
- Likelihood of participating in conservation and demand management increase with household size; larger households are more likely to participate in these programs (Single-person: 44%; Two-person: 49%; Three-person: 49%; Four-person: 64%; Five or more: 68%).
- Whether or not the electricity bill causes financial strain does not impact likelihood of participating in CDM programs.

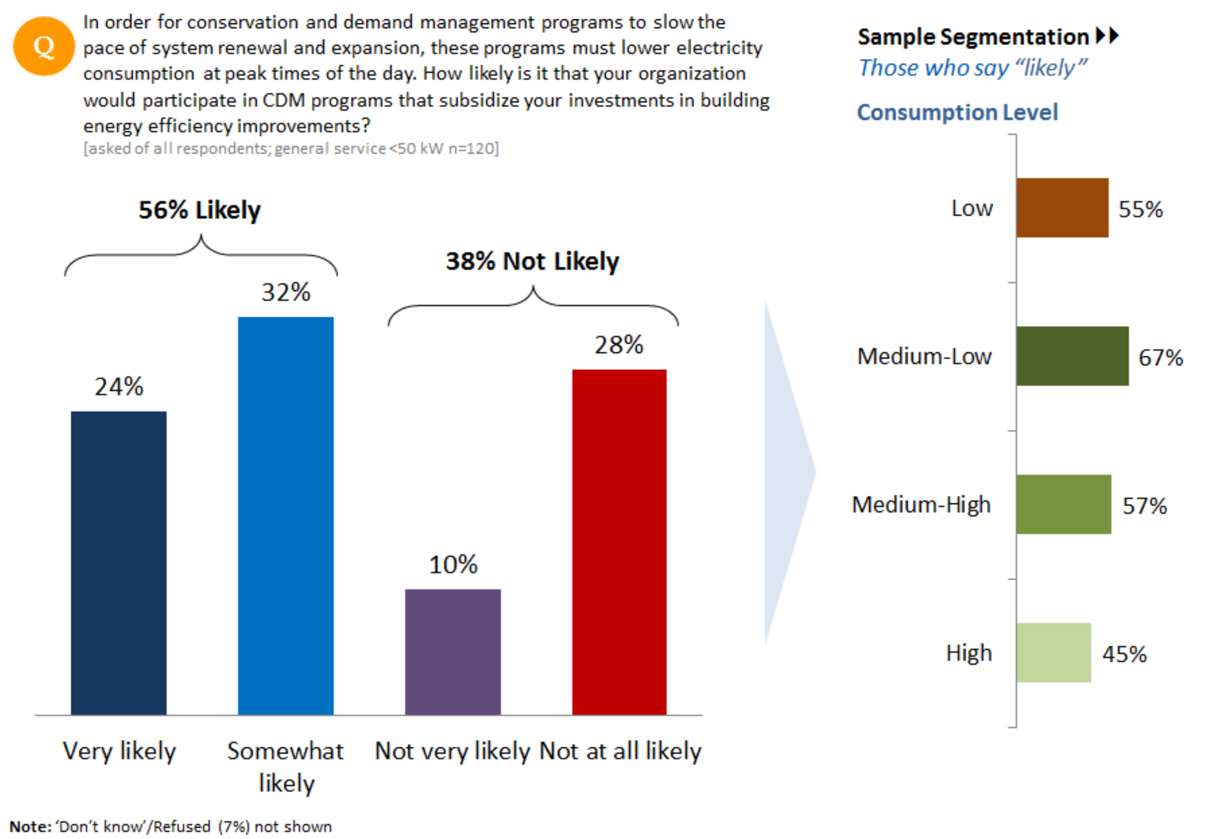
Figure RS.16: Conservation and Demand Management



This question was posed slightly differently to General Service customers. They were asked how likely it is that their organization would participate in CDM programs that would subsidize their investments in building energy efficiency improvements. Similar to residential customers, just over half (56%) are likely to participate in such programs.

- Medium-low consumption level customers are the most likely to participate in CDM programs (67%), while high consumption level customers are the least likely (45%).
- Financially strained customers are more likely than financially unstrained customers to participate in conservation and demand management programs (61% versus 51%).

Figure GS.16: Conservation and Demand Management



Customer Reaction Statements

This section measures agreement with some of the key opinion statements provided by Milton Hydro's customers in previous phases of the consultation. Graphically, statements are ranked from highest to lowest net-agreement (agreement minus disagreement).

Customer Reaction Statements

Of the 11 customer input statements provided in the questionnaire, the statement with the most support among residential customers is: *A few power outages are fine for me personally, but I worry about the impact this has on more vulnerable people, such as the elderly* (82% agree).

Among General Service customers, the most supported statement is: *We need to modernize the local electricity system so consumers can have greater control over their electricity usage* (78% agree).

The statement with the lowest level of agreement among both residential and General Service customers is: *I'm willing to pay a bit more for my electricity if it means better service reliability* (RS: 53%; GS: 51% agree).

Residential Customers

A majority of residential customers (57%) agree that *the cost of my electricity bill has a major impact on my finances and requires that I do without some other important priorities,* even more (59%) agree that they are *willing to pay a bit more for my electricity because investing in upgrading the system is money well spent*. Further, more than half (53%) say they are *willing to pay a bit more for my electricity if it means better service reliability.* However, a majority (56%) also feel that while they can afford to pay a bit more, they *worry about the impact a rate increase will have on others*.

While they may not necessarily draw a direct line between system investment and rate increases, residential customers are supportive of Milton Hydro investing in the distribution system:

- 78% agree: *Milton Hydro should invest in new infrastructure and technology to minimize the number and length of power service interruptions*
- 75% agree: *We should invest in our electricity infrastructure system now or we will end up paying more the longer we delay our system renewal*

There are also indications that customers want to be able to control and reduce their electricity consumption and costs:

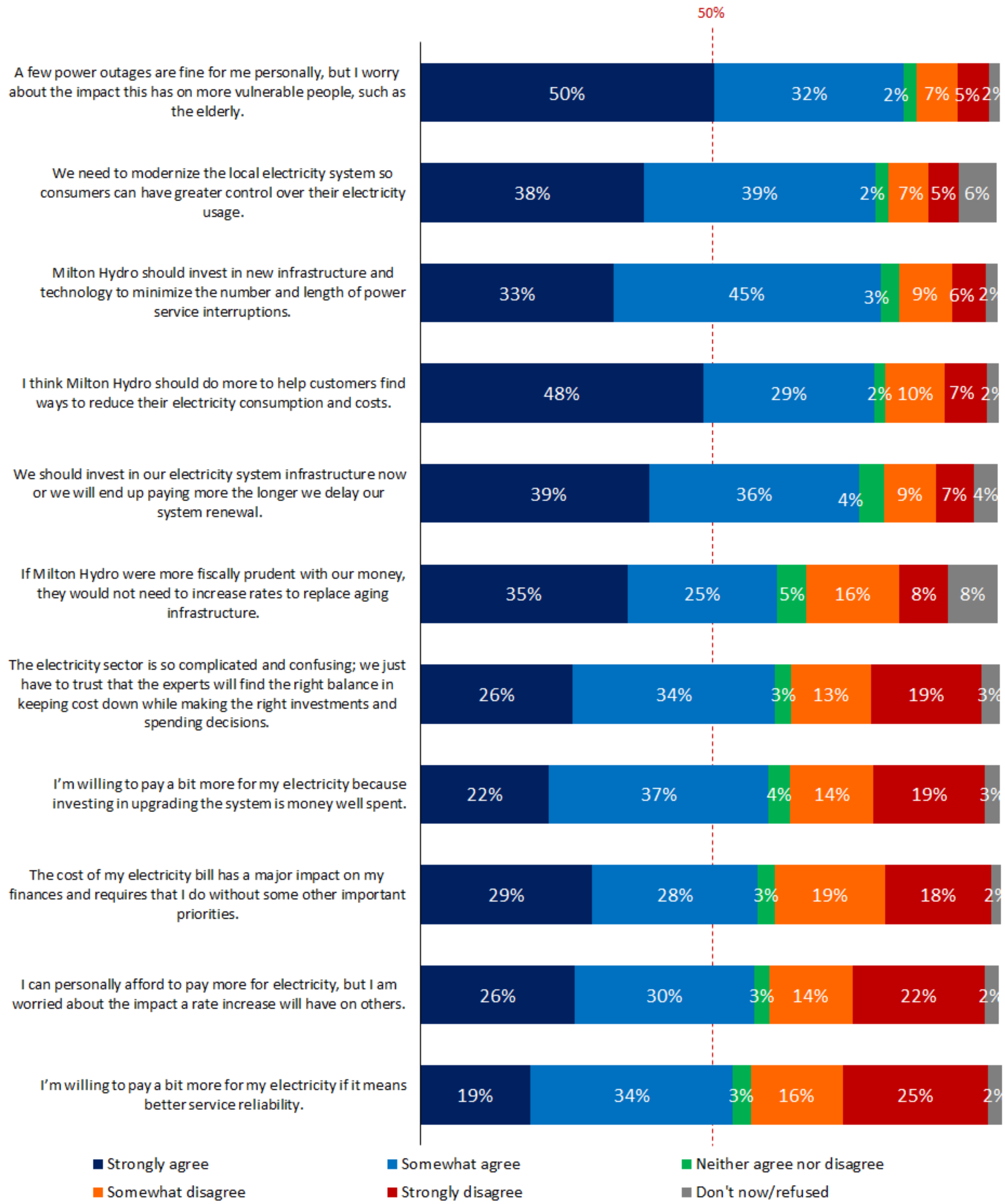
- 77% agree: *We need to modernize the local electricity system so consumers can have greater control over their electricity usage*
- 77% agree: *I think Milton Hydro should do more to help customers find ways to reduce their electricity consumption and costs*

When it comes right down to it, most (60%) residential customers feel that *the electricity sector is so complicated and confusing; we just have to trust that the experts will find the right balance in keeping cost down while making the right investments and spending decisions.*

Figure RS.17: Reaction to Customer Input

Q The following statements have been made by customers throughout Milton Hydro's community consultation process. For each statement, please tell me if you strongly agree, somewhat agree, somewhat disagree or strongly disagree.

[asked of all respondents; residential n=504]



General Service Customers

The findings are similar among General Service customers: 57% are *willing to pay a bit more for my electricity because investing in upgrading the system is money well spent* and 50% agree that they are *willing to pay a bit more for my electricity if it means better service reliability.* However, 64% report that *the cost of my electricity bill has a major impact on the bottom line of my organization and results in some important spending priorities and investments being put off.* Further, more than half (52%) say that, while they can afford to pay more for electricity, they *worry about the impact a rate increase will have on others.*

As with residential customers, General Service customers are in favour of investing in the electricity system:

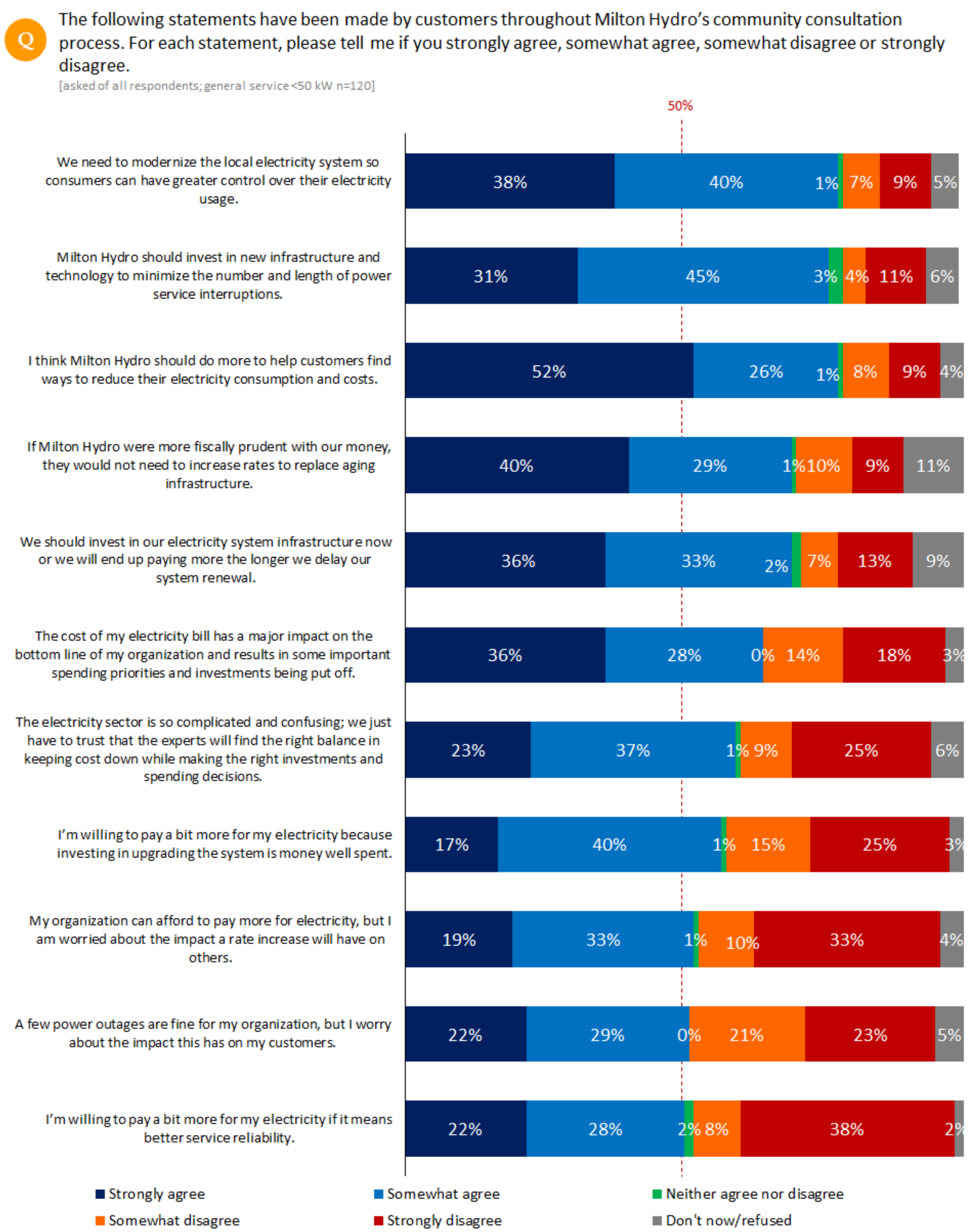
- 76% agree: *Milton Hydro should invest in new infrastructure and technology to minimize the number and length of service interruptions.*
- 69% agree: *We should invest in our electricity system infrastructure now or we will end up paying more the longer we delay our system renewal*

And, like residential customers, General Service customers would like to have more control over their electricity consumption:

- 78% agree: *We need to modernize the local electricity system so consumers can have greater control over their electricity usage*
- 78% agree: *I think Milton Hydro should do more to help customers find ways to reduce their electricity consumption and costs*

Ultimately, three-in-five (60%) General Service customers feel that *the electricity sector is so complicated and confusing; we just have to trust that the experts will find the right balance in keeping cost down while making the right investments and spending decisions.*

Figure GS.17: Reaction to Customer Input



Assessment of Plan

This section explores the degree of acceptance that Milton Hydro's customers express for a rate increase. Acceptance is defined as either support for a rate increase or agreement that it is necessary. This section also explores the underlying reasons for acceptance and opposition to a rate increase, probing more specifically through open-ended questions.

Acceptance of Rate Increase Summary

The majority (68%) of residential customers support the proposed estimated rate increase, whether they support it outright (33%), or acknowledge it as a necessity (36%). One-quarter (25%) of residential customers are opposed.

- Almost half (46%) of the residential customers who support the increase statement do so because they felt that it is minimal and affordable.
- Of the customers who don't like the increase but acknowledge its necessity, 18% say it is needed for maintaining and upgrading the equipment and infrastructure.
- Of those opposed, one-quarter (26%) feel that their Hydro bill is already too high.

Overall General Service customers support the proposed estimated rate increase to the same degree (68%) as residential customers, however the proportion that supports it outright (37%) is slightly higher. Roughly three-in-ten customers acknowledge it as a necessity (32%), and 28% oppose the increase.

- The top two reasons customers had for supporting the increase outright were that it is necessary and affordable. These opinions were shared by three-in-ten (30%) customers.
- Four-in-ten (39%) of the customers who reluctantly accept the increase do so because they acknowledge its necessity.
- The opposition most commonly cited by General Service customers is that they are already paying enough or too much (35%)

Financial Flexibility and Level of Acceptance

When financial flexibility is taken into consideration, there is a divide among households and organizations that are under financial strain, and those which are not. Three-in-five (61%) of both residential and General Service financially strained customers accept the increase. This is compared 85% of residential and 82% of General Service customers who are not financially strained.

Preamble for Assessment of Plan Section

Prior to the questions given in the Assessment of Plan Section, residential customers were presented with a preamble concerning the breakdown of pricing for Milton Hydro's 5-year plan:

*"Milton Hydro believes that a proactive and consistent renewal approach is needed to maintain system performance while keeping bill impacts manageable over the longer-term. Milton Hydro's proposed plan will spend an estimated **$49.5 million** on capital investments over the next five years between 2016 and 2020. This includes ...*

- ***$8.9 million** to replace aging infrastructure;*
- ***$30.3 million** to serve new communities and connect customers to the grid;*
- ***$3.5 million** to invest in equipment needed to maintain and operate the system; and*
- ***$6.8 million** to add new technologies into the power system.*

*To fund this plan, Milton Hydro is proposing the **average residential customers' rate increase by approximately $0.90 per month** on the distribution portion of their bill over the next five years. So, in five years, by 2020, the average residential household will be paying an **estimated $4.52 more per month** on the distribution portion of its electricity bill."*

(Note: in the General Service Survey, the final paragraph differs to capture the pertinent figures for that rate class:

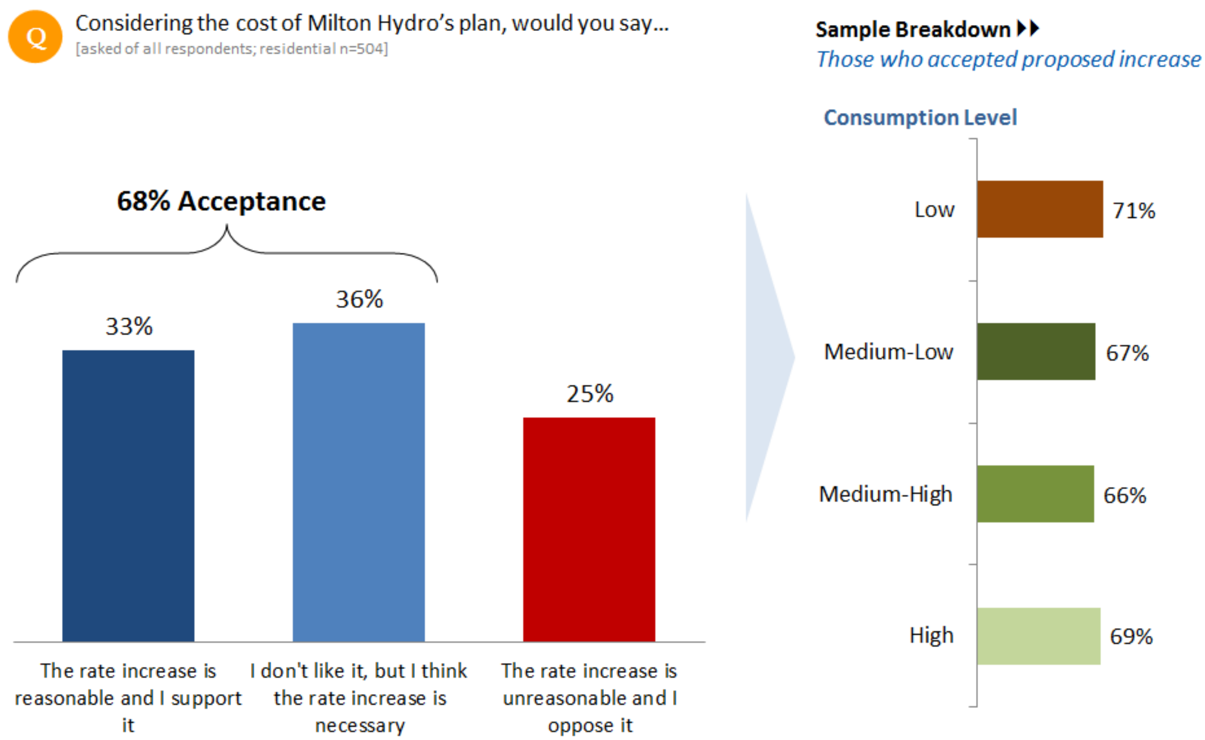
*"To fund this plan, Milton Hydro is proposing the **average small business customers' rate increase by approximately $2.43 per month** on the distribution portion of their bill over the next five years. So, in five years, by 2020, the average small business will be paying an **estimated $12.14 more per month** on the distribution portion of its electricity bill."*

Acceptance of Rate Increase

The majority (68%) of residential customers support the proposed estimated rate increase, whether they support it outright (33%), or acknowledge it as a necessity (36%). One-quarter (25%) of residential customers are opposed.

- This proportion remains relatively consistent across consumption level groups (66% - 71%).

Figure RS.18 - Acceptance of Rate Increase



Note: 'Don't know'/Refused (7%) not shown

The question of level of acceptance was followed by an open-ended question asking customers to expand on why they held that particular opinion.

The rate increase is reasonable and I support it.

- Almost half (46%) of the residential customers who chose this statement did so because they felt that the increase was minimal and affordable.
- The next most commonly cited reasons were shared by roughly one-in-ten customers: 13% felt that the increase is necessary for maintaining and upgrading the equipment and infrastructure, 11% said they feel better/reliable service is important.

I don't like it, but I think the rate increase is necessary.

- The customers who identified with this statement most commonly cited the increase's necessity for maintaining and upgrading the equipment and infrastructure (18%).

The rate increase is unreasonable and I oppose it.

- One-quarter (26%) of residential customers in opposition to the increase feel that their Hydro bill is already too much.
- One-in-ten of this group (10%) feel that the increase should come out of Milton Hydro's profits and wages.

Figure RS.19 – Rate Increase Acceptance Reasoning

Q Why do you say that? (i.e. proposed Milton Hydro rate increase)

PERMISSION: Reasonable, support it	33% RS
Increase not that much/affordable	46%
Necessary for infrastructure & equipment maintenance/upgrade)	13%
Better/reliable service	11%
Increase is necessary – general	7%
Everything is going up/increasing	5%
As long as it doesn't increase higher	4%
Do it now or pay more later	2%
Developers should pay for new developments	1%
No reason/just because/that's my opinion	1%
None	2%
Don't know	5%
Sample Size	**n=164**

NO PERMISSION: Unreasonable, oppose it	25% RS
Hydro bill already too much	26%
Should take out of profits & wages	10%
Rates go up yearly-no improvements-where does the money go	7%
Increase is too high	6%
Can't afford/low income/senior	6%
Developers should pay for new developments	5%
Should have budgeted for improvement/poor planning	3%
Everything is going up/increasing	2%
They increase every year/already had an increase	2%
Should not have to pay for distribution or debt reduction	2%
Will cost more than they say	2%
Increase not that much/affordable	1%
Better/reliable service	1%
As long as it doesn't increase higher	1%
Do it now or pay more later	1%
Wages don't increase	1%
Going to increase anyway/no choice	1%
No reason/just because/my opinion	1%
Government should cover cost through taxes	1%
Other	7%
Don't Know	10%
Sample Size	**n=126**

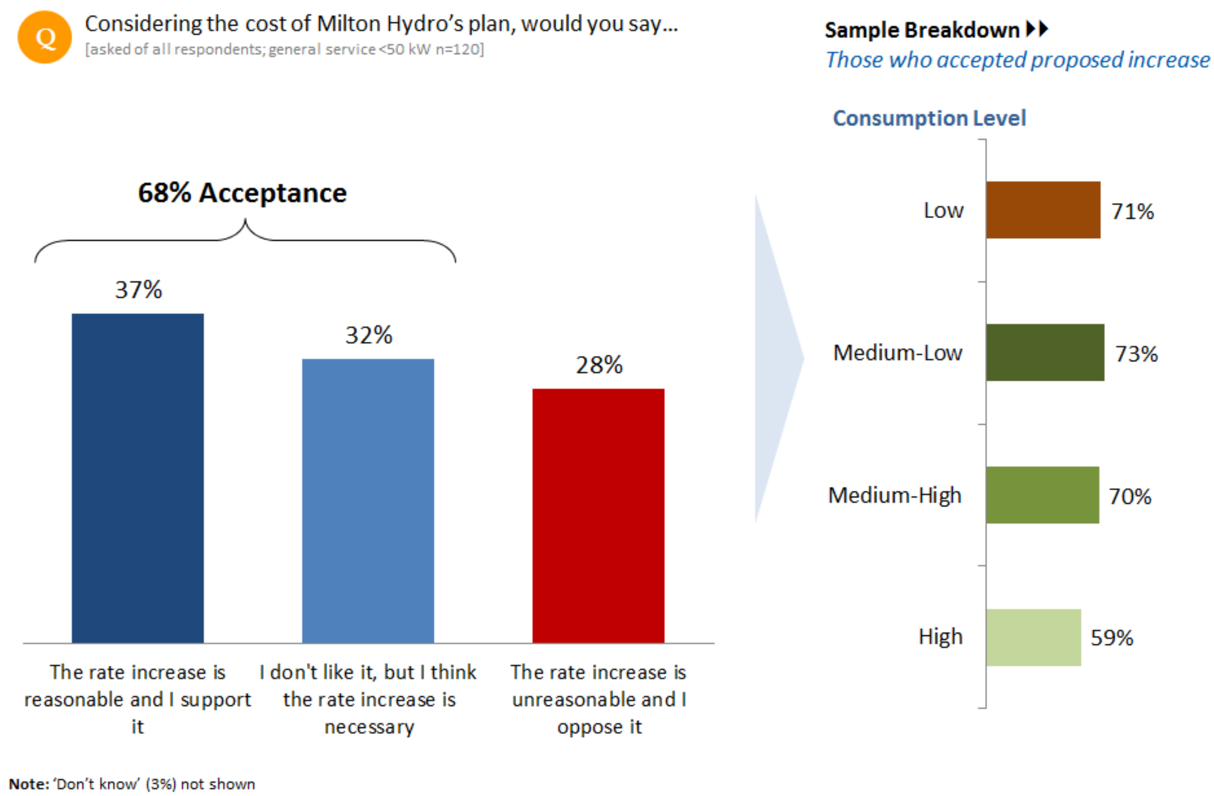
PERMISSION: Don't like, but necessary	36% RS
Need or infrastructure & equipment maintenance/upgrade	18%
No one wants to pay more but it's necessary	12%
Need it/necessary/has to be done - general	8%
Better/reliable service	6%
Do it now or pay more later	6%
Hydro bill already too much	5%
Going to increase anyway/no choice	4%
Increase not that much/affordable	3%
Everything is going up/increasing	3%
Should take out of profits & wages	3%
Should have budgeted for improvement/poor planning	3%
Developers should pay for new developments	2%
Government should cover cost through taxes	2%
Should not have to pay for distribution or debt reduction	1%
No reason/just because/my opinion	1%
Can't afford/low income/senior	1%
Will cost more than they say	1%
As long as it doesn't increase higher	1%
They increase every year/already had an increase	1%
Increase is too high	1%
Other	7%
Don't know	9%
Sample Size	**n=179**

Note: Refused/ Bad respondent not shown

Overall General Service customers support the proposed estimated rate increase to the same degree (68%) as residential customers, however the proportion that supports it outright (37%) is slightly higher. Roughly three-in-ten customers acknowledge it as a necessity (32%), and 28% oppose the increase.

- High consumption level customers show the lowest level of acceptance (59%).

Figure GS.18 - Acceptance of Rate Increase



General Service customers were also asked to expand on why they aligned with the statement they did.

The rate increase is reasonable and I support it.

- Three-in-ten customers who chose this statement agree that the increase is affordable (30%) and that the increase is necessary (30%).

I don't like it, but I think the rate increase is necessary.

- Four-in-ten (39%) of the customers who reluctantly accept the increase do so because they acknowledge its necessity.
- 13% of these customers concede that nothing is free and everything increases.

The rate increase is unreasonable and I oppose it.

- The opposition most commonly cited by General Service customers is that they are already paying enough or too much (35%).
- 12% of these customers feel that customers should not be charged – savings should be found elsewhere.
- A further 12% are mistrustful and feel there needs to be more transparency in regards to the allocation of resources.

Figure GS.19 – Rate Increase Acceptance Reasoning

Q Why do you say that? (i.e. proposed Milton Hydro rate increase)

PERMISSION: Reasonable, support it	37% GS
Affordable	30%
Upgrade is necessary	30%
Fine for better service	14%
Nothing is free/everything increases	11%
Will do it anyways-no choice	5%
Someone has to pay for it	2%
Paying enough/too much now	2%
Other	2%
Don't Know	5%
Sample Size	**n=44**

NO PERMISSION: Unreasonable, oppose it	28% GS
Paying enough/too much now	35%
Find savings elsewhere/not charge customers	12%
Don't trust/need more transparency	12%
Can't afford	9%
Should pay from profits	9%
Cut CEO salaries	9%
Fine for better service	3%
No one wants to pay more	3%
Other	9%
Sample Size	**n=34**

PERMISSION: Don't like, but necessary	32% GS
Upgrade is necessary	39%
Nothing is free/everything increases	13%
Paying enough/too much now	11%
Fine for better service	8%
No one wants to pay more	5%
Find savings elsewhere/not charge customers	5%
Someone has to pay for it	3%
Can't afford	3%
Should pay from profits	3%
Don't trust/need more transparency	3%
Other	5%
Don't Know	3%
Sample Size	**n=38**

Financial Flexibility and Level of Acceptance

It is expected that the proposed rate increase would have greater financial impact on some customers than others; consequently, the customers' level of acceptance for rate increase could differ depending on their level of financial flexibility. Financial flexibility was captured in the customer input statements:

Residential: *The cost of my electricity bill has a major impact on my finances and requires that I do without some other important priorities.*

General Service: *The cost of my electricity bill has a major impact on the bottom line of my organization and results in some important spending priorities and investments being put off.*

Customers who agreed with these statements were considered to be "financially strained."

Overall, acceptance is lower among residential customers from financially strained households than those who are not strained (61% versus 85%). Financially strained residential customers are almost three times more likely to oppose the rate increase than those who are not financially strained (34% versus 12%).

Figure RS.20 - Financial Flexibility and Level of Acceptance

	Financially Strained Households	Not Financially Strained Households
The rate increase is reasonable and I support it	28%	43%
I don't like it, but I think the rate increase is necessary	33%	42%
The rate increase is unreasonable and I oppose it	34%	12%
Overall Permission	**61%**	**85%**

Note: 'Don't know'/'Refused' not shown

General Service customers demonstrate proportions similar to residential customers. Organizations not financially strained are much more likely to accept the rate increase (82% versus 61%).

Figure GS.20 - Financial Flexibility and Level of Acceptance

	Financially Strained Organizations	Not Financially Strained Organizations
The rate increase is reasonable and I support it	26%	59%
I don't like it, but I think the rate increase is necessary	35%	23%
The rate increase is unreasonable and I oppose it	35%	15%
Overall Permission	**61%**	**82%**

Note: 'Don't know'/'Refused' not shown

Workbook Appendix:

Milton Hydro's Distribution System Investment Plan Review

DISTRIBUTION SYSTEM INVESTMENT PLAN REVIEW

Residential Customer Consultation Workbook

June 2015

MILTON HYDRO

Milton Hydro Distribution Inc. ("Milton Hydro") is the local distribution company responsible for distributing electricity within the Town of Milton.

Milton Hydro operates and maintains a distribution system serving approximately 36,000 residential, commercial and industrial customers, in a service territory of 371 square km.

Milton Hydro is a wholly-owned subsidiary of Milton Hydro Holdings Inc., which, in turn, is 100% owned by the Town of Milton.

Table of Contents

What is This Consultation About?

The purpose of this customer consultation is to collect your feedback on Milton Hydro's investment and spending plan from 2016 to 2020.

Milton Hydro's goal is to deliver safe and reliable electricity to homes and local businesses as efficiently as possible and at an affordable price. However, there is a balancing act that all utilities must consider when planning for the future: system reliability and resilience vs. the cost to consumers. No utility can guarantee that its distribution system can deliver perfectly reliable electricity. Generally, the more reliable the system, the more expensive the system is to build, operate and maintain.

This customer consultation is designed to collect your feedback on the reliability of the electricity distribution system and the spending choices Milton Hydro will need to make to maintain its system reliability going forward. Ultimately, this consultation will provide Milton Hydro with additional insights, allowing better alignment between operational and capital investment plans and customers' needs and preferences.

As a Milton Hydro customer, this is an opportunity for you to tell Milton Hydro what you think about the plan and the cost implications for you. This is also an opportunity for Milton Hydro to explain to you the challenges in operating and maintaining the local electricity distribution system, and more importantly how Milton Hydro intends to meet those challenges.

To participate in this review, you do not need to be an expert. The workbook explains key parts of the electrical distribution system, the challenges facing the system, Milton Hydro's recent work to maintain the system, and the company's budgetary plan for the next 5 years.

Milton Hydro does not expect you to make electrical engineering decisions. Milton Hydro wants to hear about the electricity issues that matter most to you and whether or not you feel the company's spending and investing priorities seem reasonable.

This workbook is designed to provide enough background about these issues so you can develop an informed opinion.

The process that Milton Hydro must follow

How are electricity rates determined in Ontario?

The electricity industry in Ontario is regulated by the Ontario Energy Board, which recently developed a new regulatory requirement for electricity distributors, such as Milton Hydro, to gather customer preferences on distribution system investments.

Milton Hydro is mainly funded by the distribution rates paid by its customers. Periodically, Milton Hydro is required to file an application with the Ontario Energy Board to get approval for the funding required to operate, maintain and expand the distribution system. Milton Hydro must submit evidence to justify the amount of funding it needs to safely and reliably distribute electricity to its customers.

As a customer, how are my interests protected?

Milton Hydro's rationale for a customer rate adjustment is assessed in an open and transparent public process known as a rate hearing. Any individual or group may intervene on Milton Hydro's application to ask questions or challenge Milton Hydro's plans and assumptions. At the end of the process, the Ontario Energy Board weighs the evidence and decides on the rates Milton Hydro can charge for distribution.

Why is my feedback important?

Your feedback will be presented to the Ontario Energy Board when Milton Hydro files its rate application for 2016. As part of the rate hearing process, the Ontario Energy Board will review how Milton Hydro acquired and responded to customer feedback on its distribution system plan.

Rate Application Process

Milton Hydro assesses system needs

↓

Collects customer needs and preferences

↓

Refines plan (where necessary)

↓

Reports on how plan responds to customer input

↓

Files plan with Ontario Energy Board

↓

Interrogatories & Ontario Energy Board rate hearing process

↓

Ontario Energy Board sets Milton Hydro's distribution rates

Innovative Research Group Inc. has been engaged by Milton Hydro to collect participant feedback and will deliver it to Milton Hydro to assist them in shaping their rate application and distribution system plan.

Consumer feedback on Ontario's electricity system

There are a number of ways for consumers to voice their opinions on provincial, regional and local electricity issues. However, this consultation is about your local distribution system and your preferences on how Milton Hydro uses your money.

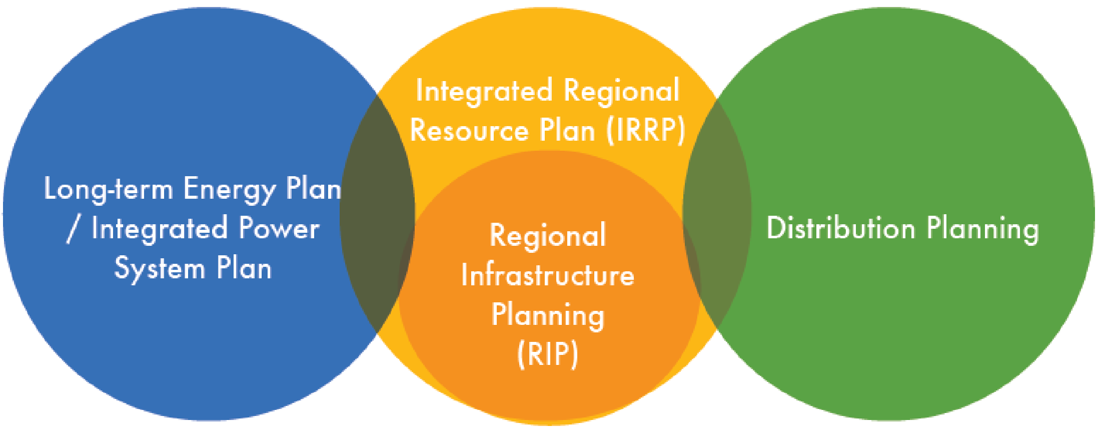
Distribution Planning: This workbook and consultation concentrates on the short-term plan for Milton Hydro's distribution system. The graphic below shows the various planning initiatives ongoing across Ontario's electricity system. In addition to the short-term distribution plan being discussed in this workbook, there are other planning initiatives undertaken to ensure that the distribution system maintains reliability and works efficiently for the benefit of customers.

If you're interested in broader medium- and long-term electricity issues such as Ontario's Long-Term Energy Plan, regional planning, conservation planning and general energy policy in the province, there are other opportunities to provide your feedback.

Ontario's Long Term Energy Plan: The Ontario Government's plan details how electricity will be generated and the longer-term conservation strategy for the province. It can be found at this website: http://www.energy.gov.on.ca/en/ltep/

Regional Planning: The Independent Electricity System Operator (IESO) looks ahead to the future electricity needs of your region and how those needs can be addressed through energy conservation programs, local generation, and electricity from outside the region. You can follow the IESO's regional planning process at this website: http://www.ieso.ca/Pages/Participate/Regional-Planning/default.aspx

Electricity System Planning in Ontario



Provincial System Planning

This involves more long-term planning on how Ontario's electricity system is designed and operated.

This includes planning on:

- Provincial electricity supply mix (e.g. greening the grid and phasing out coal power generation)
- System supply and demand forecasting
- Interconnections and grid design

Regional Planning

Regional planning involves near- and medium-term plans to meet the needs of a region of the province, and ensure all key players (i.e. transmission and distribution operators) are coordinated moving forward.

This planning process is focused on considering whether conservation and local generation options have been considered, in addition to core infrastructure ("wires") solutions.

Distribution Network Planning

Distribution planning involves plans, both near- and longer-term, to ensure the local distribution systems have adequate infrastructure to meet required reliability and safety standards, and to otherwise meet the needs of customers.

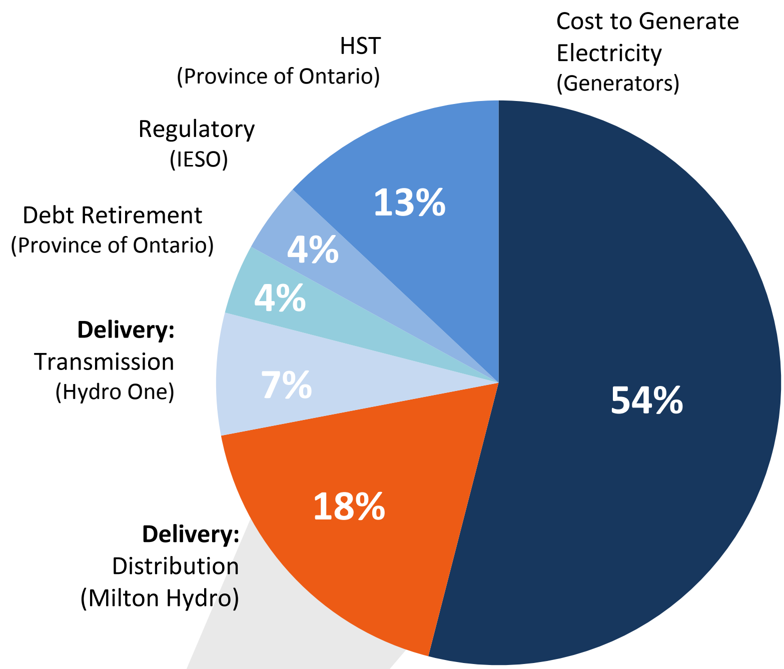
MILTON HYDRO

Customer Electricity Bills

Your Electricity Bill: Every item and charge on your bill is mandated by the provincial government or regulated by the Ontario Energy Board. There are two distinct cost areas that make up the "Delivery" charge on your bill: ***distribution*** and ***transmission***. While Milton Hydro collects both, it remits the transmission charge to Hydro One, who manages and operates Ontario's transmission system. The distribution charges are what Milton Hydro uses to fund its utility needs. Distribution costs make up about 18% of the typical residential customer's (800 kilowatt hours [kWh] per month) total electricity bill.

Milton Hydro's distribution rates are subject to the review and approval of the Ontario Energy Board. The revenues collected from customers cover Milton Hydro's capital investments and operating expenses.

About 18% of the average residential electricity bill goes to Milton Hydro



MILTON HYDRO

SAMPLE RESIDENTIAL MONTHLY BILL

Milton Hydro Distribution Inc.

Account Number:
000 000 000 000 0000

Meter Number:
00000000

Your Electricity Charges

Electricity	
Off-Peak @ 8.00 ¢/kWh	43.77
Mid-Peak @ 12.200 ¢/kWh	17.19
On-Peak @ 16.100 ¢/kWh	24.02
Delivery (Milton Hydro $28.37)	40.05
Regulatory Charges	5.52
Debt Retirement Charge	5.60
Total Electricity Charges	**$136.15**
HST	$17.70
Subtotal	**$153.85**
Ontario Clean Energy Benefit (-10%)	(-15.39)
Total Amount	**$138.46**

Current monthly distribution charges are approximately **$28.37 or 18% of the total monthly bill** for a typical Milton Hydro residential customer who consumes 800 kWh in a month.

It is estimated that an additional **$2.62** per month will be required in 2016 to operate, maintain, and modernize Milton Hydro's electricity distribution system. For 2017 through 2020, it is estimated that an additional $0.48 per month each year (or about 1.5% per year) will be required to address the needs of the local electricity system.

Electricity Grid 101
Who Does What in Ontario's Power System?

Ontario's electricity system is owned and operated by public, private and municipal corporations across the province. It is made up of three components: **generation**, **transmission** and **distribution**.

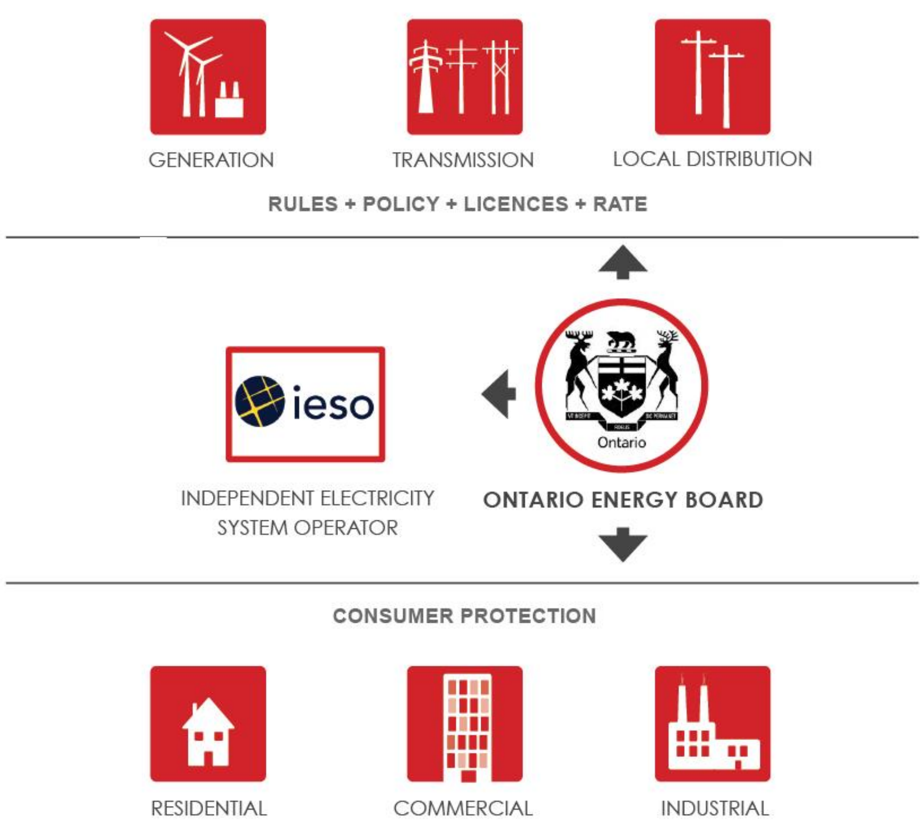
GENERATION Generating facilities convert various forms of energy into electric power.	**EXAMPLE** Ontario Power Generation TransCanada Energy Ltd Bruce Power Samsung Renewable
TRANSMISSION Transmission lines connect the power produced at generating facilities to substations.	**EXAMPLE** Hydro One
DISTRIBUTION Distribution lines carry electricity to homes and businesses.	**EXAMPLE** Milton Hydro Burlington Hydro Halton Hills Hydro
CONSUMERS Electricity is delivered to homes and businesses.	**EXAMPLE** Residential Commercial Industrial

Electricity Grid 101:
How is Ontario's Electricity System Regulated?

Ontario Ministry of Energy:
The Ontario Ministry of Energy sets energy policy. It sets the rules and establishes key planning and regulatory agencies through legislation.

Ontario Energy Board:
The mission of the Ontario Energy Board is to promote a viable, sustainable and efficient energy sector that serves the public interest and assists consumers to obtain reliable energy services at reasonable cost. It is an independent body established by legislation that sets the rules and regulations for the provincial electricity sector. One of the Ontario Energy Board's roles is to review the distribution plans of all electricity distributors and approve their rates.

The Independent Electricity System Operator:
The Independent Electricity System Operator (IESO) – is responsible for short-, medium- and long-term electricity planning to ensure an adequate supply of electricity is available for Ontario residents and businesses. It operates the electricity grid in real-time to ensure that Ontario has the electricity it needs, where and when it needs it. The IESO receives directives from the Ministry of Energy (i.e., energy supply mix, Green Energy Act), but otherwise works at arm's-length from the government.



Customer Feedback

1. Before this consultation, how well do you feel you understood the parts of Ontario’s electricity system?
   - ❑ Very well
   - ❑ Somewhat well
   - ❑ Not very well
   - ❑ I didn’t understand at all

2. Generally, how satisfied are you with the service you receive from Milton Hydro?
   - ❑ Very satisfied
   - ❑ Somewhat satisfied
   - ❑ Somewhat dissatisfied
   - ❑ Very dissatisfied
   - ❑ Don’t know

3. Is there anything in particular that Milton Hydro can do to improve its service to you?

Milton Hydro's Distribution System Today

This section describes the construction of Milton Hydro's electricity distribution system including its substations, overhead and underground systems. It also explains the company's historical growth and current electrical infrastructure.

Background on Milton Hydro's Distribution System

Milton Hydro is a mixed urban/rural utility with an expanding population and distribution system. The urban area comprises approximately 15% of the service territory while the rural area comprises 85% of the service territory.

Milton Hydro is responsible for maintaining distribution and infrastructure assets deployed, including 549 kilometers of overhead lines and 416 kilometers of underground lines. A significant portion of these assets have been installed since 2001.

From 1991 to 2001, Milton Hydro had modest customer growth and related infrastructure investment. Since 2001, the Town of Milton has experienced extremely high growth and consistent with the pattern of growth in the community, Milton Hydro's annual average investment in distribution plant also increased primarily to meet system access requirements.

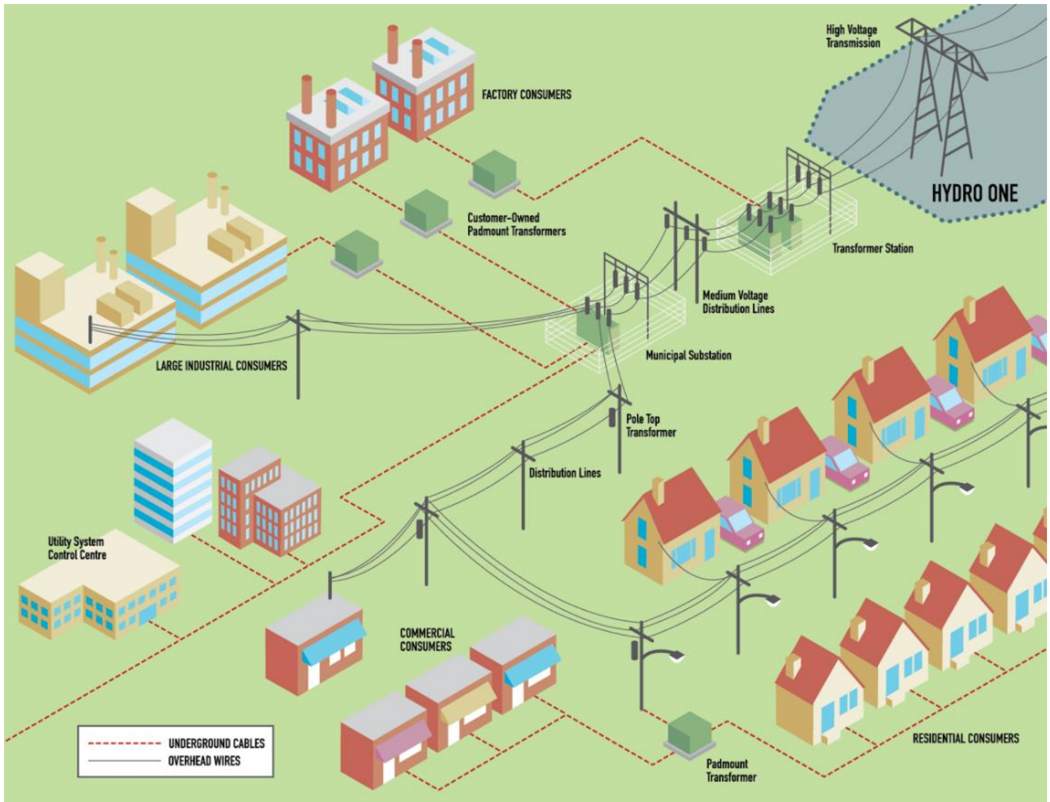
Local growth will be a key driver of future investment needs. Milton Hydro's customer growth has averaged 5% annually since 2009. Milton is expected to continue to grow to a population of 147,400 in 2021. Milton's current population exceeds 100,000. The Town of Milton has been identified in provincial legislation as one of the Urban Growth Centres in the Greater Golden Horseshoe. Significant intensification growth around Milton is identified in both the 2012-2021 and 2021 – 2031 periods of Halton Region's Official Plan.

As of December 31, 2014, Milton Hydro served approximately 32,268 residential customers, 2,544 small business (GS<50kW) customers, and 299 mid-large (GS>50kW) customers in a service area of 371 square kilometers.

Milton Hydro’s Distribution System Today

How the Electricity Distribution System Works:

Every distribution system is unique with its own history and challenges. In order to better understand the current Milton Hydro distribution system, we first have to understand all of the different components and how they impact the way in which you receive electricity when you need it. This diagram below and following terms will help guide you through the system.



Milton Hydro is supplied power from five transformer stations at 44kV and 27.6kV. Four of these transformer stations are owned and operated by Hydro One Networks Inc, and one is owned and operated by Oakville Hydro. The majority of customers are served from Milton Hydro’s 27.6kV distribution transformers. The 27.6kV feeder network is used to move the power to residential and small commercial neighbourhoods where it is transformed down, through local distribution transformation facilities, to user utilization levels of 120/240V, 600/347V and 120/208V.

Hydro One’s Transmission System:

High Voltage Transmission – Connects our distribution system to electricity generating stations across the province.

Transmission Station – Reduces high voltage electricity from transmission lines to medium voltage which is fed into Milton Hydro’s distribution grid.

Milton Hydro’s Distribution System:

Some areas are supplied directly by Transmission Stations, other areas are supplied by **Municipal Substations**, which are local hubs from where electricity is distributed to an area. Municipal substations contain:

Transformers - Important pieces of equipment that reduce the voltage of electricity from a high level to a level that can be safely distributed to your area.

Feeder Circuits - The wires that connect the transformer station to the broader distribution system in order to deliver electricity to customers

Breakers - Devices that protect the distribution system by interrupting a circuit if a higher than normal amount of electricity is detected.

Switches - Control the flow of electricity and steer the current to the correct circuits.

Milton Hydro's Distribution System Today: *Asset Management*

Managing the Distribution System

Milton Hydro adheres to the Ontario Energy Board's Distribution System Code that sets out good utility practices, minimum performance standards, and minimum inspection requirements for distribution equipment. Historically, maintaining and upgrading equipment has been achieved with only a moderate increase in customers' bills. Milton Hydro has been prudent when incurring costs since customer satisfaction survey results indicate that the low price of electricity is an important factor to customers.

Despite best practices, there are several assets within the Milton Hydro distribution system that are nearing the end of their useful life and will have to be replaced.

Asset	# in System	Length of Useful Life	# with <10% Useful Life Remaining
Substation Transformers	5	40	2
Regulators	5	40	0
Circuit Breakers	4	40	2
Pole Mounted Transformers	2,628	40	474
Pad Mounted Transformers	2,555	40	17
Pad Mounted Switchgear	75	30	4
Overhead Switches (Manual)	299	45	52
Overhead Switches (Automatic)	60	30	0
Vault Transformers	107	40	10
Submersible Transformers	470	40	2
Underground Cable (metres)	579,209	40	9,318
Poles – Wood	8,745	45	2,364
Poles – Concrete	710	45	39

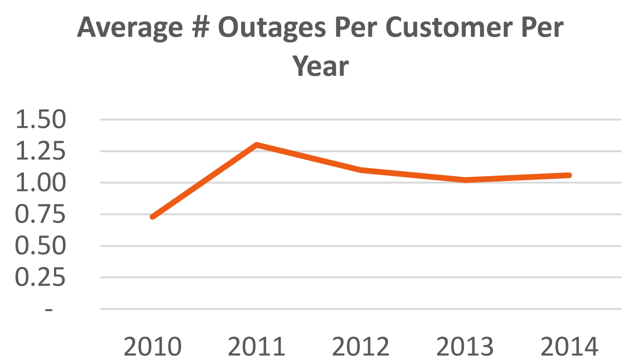
Customer Feedback

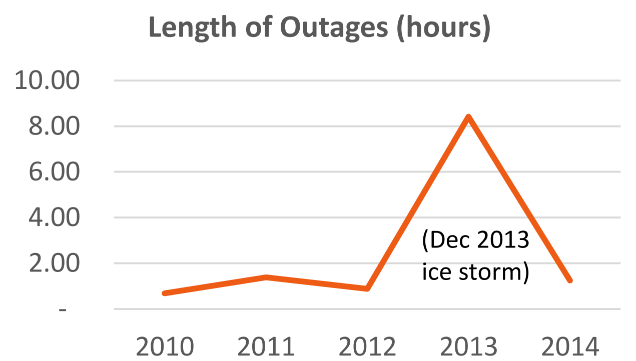
4. How well do you feel you understand the important parts of the electricity system, how they work together, and which services Milton Hydro is responsible for?
   - ❑ Very well
   - ❑ Somewhat well
   - ❑ Not very well
   - ❑ I don't understand at all

System Reliability

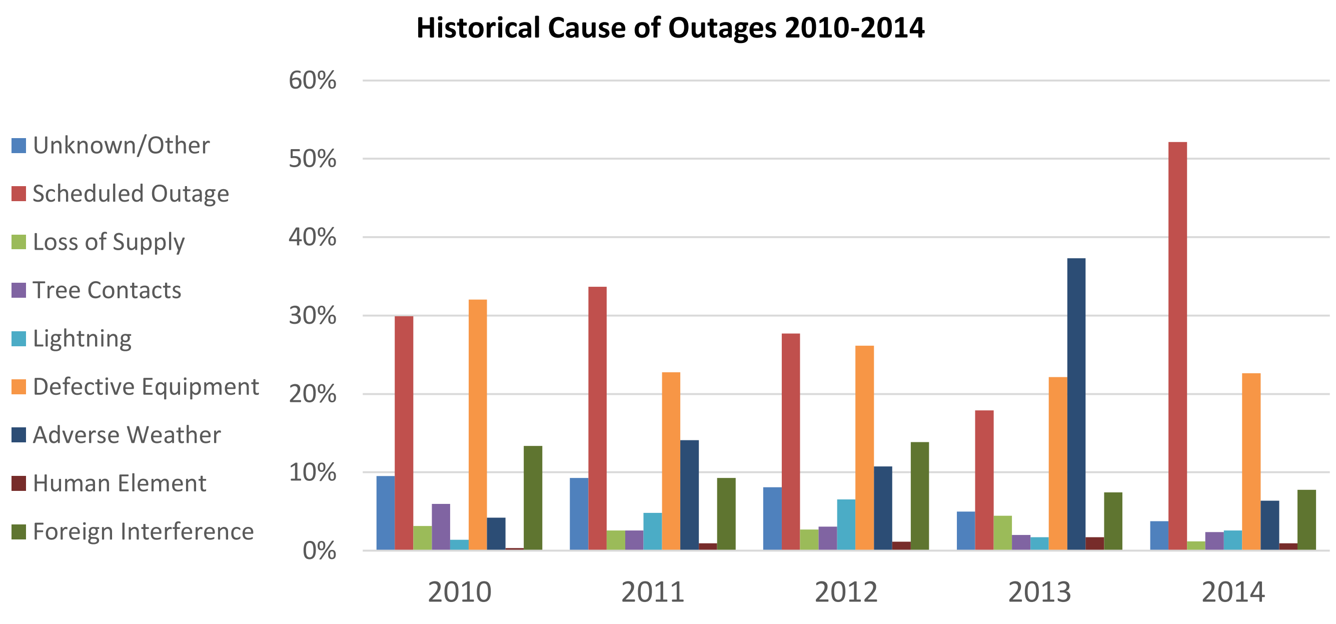
No utility can guarantee that its distribution system can deliver perfectly reliable electricity. There is a balancing act between reliability and the cost of running the system. Milton Hydro's commitment to customers is to ensure ***"highest standards of performance and business excellence for the safe, reliable provision of service".***

The reliability indices indicate that equipment failure and adverse weather are two of the key contributors to customer outages. While the number of equipment failure related outages has been fairly steady over the historical period, there has been an increase in the frequency of adverse weather related outages. Climate change experts indicate that adverse weather conditions are expected to increase putting additional strain on the design and operation of the distribution system. This highlights the need for Milton Hydro to continue to manage its assets through its Asset Management Plan and investigate the impact of climate change on the design and operation of the distribution system.





The various causes of outages has remained fairly steady over the past five years, with the notable exceptions of the ice storm in 2013 and the high number of scheduled outages in 2014. Many (94) of these scheduled outages were due to porcelain switch replacements following a 2010 Electrical Safety Authority report identifying porcelain as a known equipment weakness.



Customer Feedback

5. The ice storm in December 2013 was an unusual and extreme weather event. Were you personally affected by electrical outages in Milton as a result of the ice storm?
   - ❑ Yes
   - ❑ No

6. Whether you were personally affected or not, how satisfied were you with the performance of Milton Hydro's line crews during the ice storm?
   - ❑ Very satisfied
   - ❑ Somewhat satisfied
   - ❑ Somewhat dissatisfied
   - ❑ Very dissatisfied
   - ❑ Don't know

7. And again, whether you were personally affected or not, how satisfied were you with Milton Hydro's communication during the ice storm?
   - ❑ Very satisfied
   - ❑ Somewhat satisfied
   - ❑ Somewhat dissatisfied
   - ❑ Very dissatisfied
   - ❑ Don't know

8. Is there anything in particular that Milton Hydro could have done to improve its service to you during the ice storm?

9. The average Milton Hydro customer experiences about 1 power outage per year. Do you recall how many outages you experienced in the <u>past 12 months</u>?
   - ❑ None
   - ❑ One
   - ❑ Two
   - ❑ Three
   - ❑ More than three
   - ❑ Don't know

Customer Feedback

10. Aside from the ice storm, thinking back to the most recent power outage you experienced as a Milton Hydro customer, would you say the power outage …
    - ❑ Was a major inconvenience
    - ❑ Was a minor inconvenience
    - ❑ Was no inconvenience at all
    - ❑ Have not had a recent power outage
    - ❑ Don't know

11. How satisfied were you with Milton Hydro's management of the most recent power outage you experienced?
    - ❑ Very satisfied
    - ❑ Somewhat satisfied
    - ❑ Somewhat dissatisfied
    - ❑ Very dissatisfied
    - ❑ Don't know

No system delivers perfectly reliable electricity. There is a balancing act between reliability and the cost of running the system. Please answer the following questions:

12. How reasonable were the number of power outages you experienced over the last 12 months?
    - ❑ Very reasonable
    - ❑ Somewhat reasonable
    - ❑ Not very reasonable
    - ❑ Not reasonable at all
    - ❑ Did not have any power outages
    - ❑ Don't know

13. How many power outages do you feel are reasonable in a year?
    - ❑ No outage is reasonable
    - ❑ One
    - ❑ Two
    - ❑ Three
    - ❑ Four
    - ❑ More than four

14. What do you feel is a reasonable duration for a power outage?
    - ❑ No outage is reasonable
    - ❑ 30 minutes
    - ❑ 1 hour
    - ❑ 2 hours
    - ❑ 3 hours
    - ❑ 4 hours or more

15. Is there a certain length of time at which the costs and consequences of an outage become more serious for you?

Cost Pressures

From the day-to-day operation to repairing damage caused by severe weather events, there are a variety of ever-present pressures on Milton Hydro's operating and capital budget.

Many of these expenditures are items over which Milton Hydro has little or no control – major storms, and the implementation of Provincial directives such as Smart Meters, Regional/Municipal projects and growth.

Other costs are associated with preventative maintenance like replacing aging equipment. Over recent years, Milton Hydro has undertaken several large scale projects to maintain or upgrade the system, and more are planned.

How does Milton Hydro prioritize repairs or upgrades to aging infrastructure?

Milton Hydro monitors the health of its electric infrastructure very closely. As part of its rate application, Milton Hydro must show that through its own staff or third parties, it monitors the condition of its system's assets. This knowledge of asset conditions helps Milton Hydro prioritize which parts of its system get upgraded or rebuilt first.

Why hasn't Milton Hydro set aside funds to pay for required upgrades?

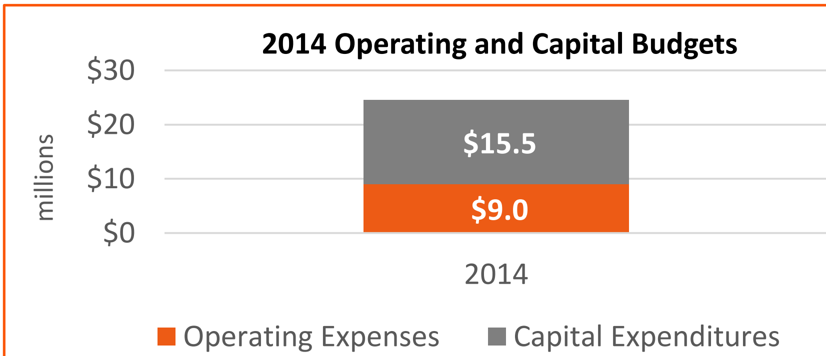
The Ontario Energy Board does not allow utilities in Ontario (including Milton Hydro) to create reserve funds. If reserve funds were allowed, a utility would have to charge customers a premium on their rates to set money aside. In accordance with the Ontario Electricity Act and the regulatory codes, a utility can only charge customers the rate required to run the distribution system at a reliability standard set by regulatory bodies.

Paying for the Distribution System

As is typical of most businesses, Milton Hydro manages its spending in two budgets – an operating budget and a capital budget.

Milton Hydro's **operating budget** covers regularly recurring expenses such as the costs of running service vehicles, the payroll for employees, and the maintenance of distribution equipment and buildings.

Its **capital budget** covers items that, when purchased, do not need to be repurchased for some time and that have lasting benefits over many years. This can include much of the equipment that is part of the distribution system, such as poles, wires, underground cables and transformers, major computer systems, and vehicles.



Managing the distribution system requires millions of dollars in maintenance, system access, system renewal and running the day-to-day operations. In its last fiscal year (2014), Milton Hydro's operating expenses and capital expenditure totalled $24.5 million.

Paying for Milton Hydro's Distribution System: *Types of Capital Investments*

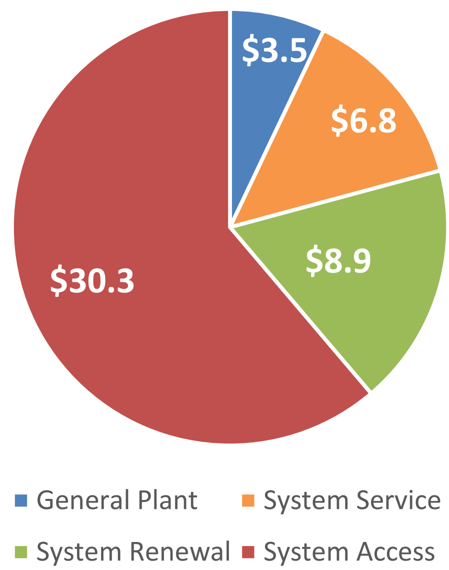
What are the major issues Milton Hydro needs to address?

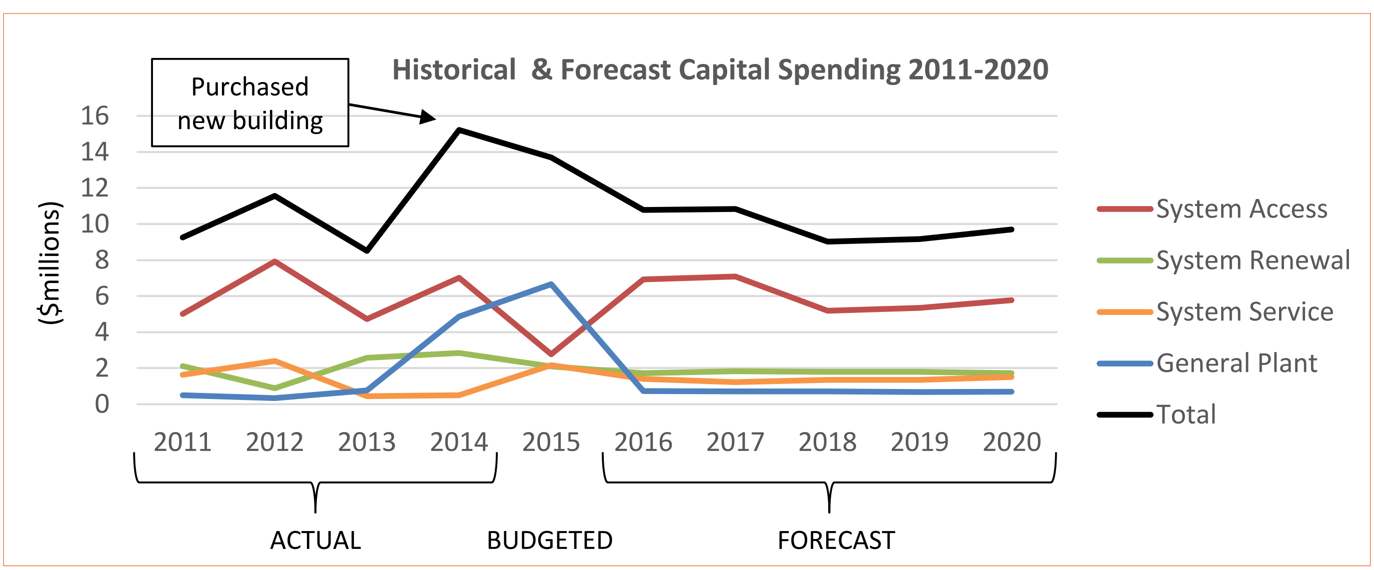
Over the years, Milton Hydro has worked hard to keep its equipment working well to keep up with growth and to get maximum value for money. However, Milton Hydro`s key challenge still comes from the need to continue investing in plant assets to keep up with growth as well as replace aging equipment.

Between 2016 and 2020, the capital expenditures required to address system access, system renewal, maintain system reliability and invest in other infrastructure priorities are estimated by Milton Hydro to be **$49.5 million**.

Milton Hydro plans for four types of capital investment costs:

2016-2020 Forecasted* Capital Expenditures (millions)





*These figures are subject to change upon final rate application submission.

Paying for Milton Hydro's Distribution System: *Capital Investment Drivers*

Milton Hydro`s capital investment plans are driven by three key factors:

1. Milton Hydro's obligation to connect customers in accordance with Section 28 of the Electricity Act, 1998, Section 7 of Milton Hydro's Electricity Distribution Licence and the Distribution System Code.

2. The Town of Milton and the Region of Halton are investing in the widening of roads, installation of sewers and water which in many cases results in Milton Hydro being required to relocate existing distribution lines.

3. Milton Hydro's commitment to provide a safe and reliable supply of electricity to its customers.

The key investments for each category of capital investment are described below

SYSTEM ACCESS
(Customer requests for new connections or new infrastructure development. Usually a high priority, "must do" request)

- Customer service requests - continued high growth in the Town of Milton requiring new customer connections
- 3rd party infrastructure - planned road widening work by the Town of Milton/Halton Region requiring asset relocation
- Mandated service obligations

Due to the continued high growth in the Town of Milton, System Access needs in the 2016 – 2020 period will continue to focus on new subdivision connections and asset relocation due to urbanization and intensification of the road network.

SYSTEM RENEWAL
(Replacing aging equipment in poor condition)

- Failure risk - multiyear planned pole replacement program
- Functional obsolescence - conversion of municipal substations from 13.8kV to 27.6 kV supply
- High Performance risks - overhead line rebuilds

System Renewal spending will continue to focus on converting the remaining 13.8kV supplied areas to 27.6kV supply and the planned proactive pole replacement program.

SYSTEM SERVICE
(Projects that improve system reliability)

- System constraints – line extensions and feeder interconnections to accommodate system demand growth
- System operational objectives – projects to maintain system reliability and efficiency and implementation of Milton Hydro's Smart Grid program

System Service spending will continue to focus on the development of Milton Hydro's Smart Grid through installation of automated switches and sensors to improve system operations and efficiencies, and the deployment of new feeders to access new transformer station capacity by 2020.

GENERAL PLANT
(Assets that support the system)

- System Maintenance support – replacement of vehicles; tools
- Business Operations efficiency – GIS development
- Non-system Physical assets – new Milton Hydro head office

Operating Cost Drivers

In addition to its capital budget, Milton Hydro needs to consider its operating budget which also impacts customer bills.

Cost drivers contributing to the operating budget can largely be attributed to on-going maintenance and management of the distribution system.

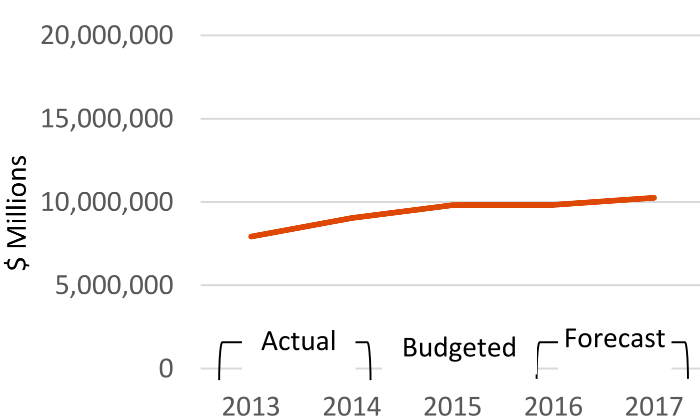
Labour Costs:

- Increased workload from customer growth, provincial policies and the operating and maintenance needs of the system.
- Annual wage and benefit increases -compensation at Milton Hydro is in line with industry benchmarks.

Customer Engagement:

- The OEB now requires all local distribution companies to demonstrate that they have consulted customers before applying for a rate increase. Milton Hydro agrees with this new practice, but these programs add to operating costs.
- Milton Hydro completed its first bi-annual Customer Satisfaction Survey with overall rating of A.
- All new customers go on e-billing as the default and paper bills on request. Over 20% of customers on e-billing and continues to encourage existing customers to transition to paperless billing resulting in savings of $63k per year in reduced postage, paper and printing costs.
- Milton Hydro continues to make changes to its website including easy to use online forms, a focus on conservation information and information on system status. Major unplanned outages are updated on the website and customers are informed that Milton Hydro is responding. Milton Hydro also uses social media to advise customers on system status.

Operating Costs: Historical and Forecast



Business & Strategic Planning:

- Since 2010, there has been an unprecedented amount of change in the electricity sector. Changes are occurring at every level (government, regulatory, municipal) and they impact how Milton Hydro operates.
- Based on the latest OEB statistics, in 2013, of 73 LDCs, Milton Hydro was the 27th largest, ranking 10th with respect to number of customers per employee and 19th with respect to OM&A per customer
- Minimizing IT costs by maintaining existing IT systems. New modules are being added to meet new functional requirements on an as-needed basis only.
- Updating its Financial System and implementing a Work Management System in 2015
- Electrical System Improvements in Rural Area
- As part of its mandate, Milton Hydro is required to manage vegetation in proximity to power lines. Milton Hydro's tree trimming efforts are intended to minimize power interruptions. From 2010 to 2014, the percentage of outages related to Trees or Adverse Weather is approximately 19%.

To set the context of Milton Hydro's operations, below are some examples of the other things Milton Hydro does on top of construction and maintenance of the physical distribution system. In 2014:

- Installed **968** new residential services and **112** transformers
- managed **6,534** customer locate requests, responded to **389** customer appointments/written inquiries and **565** trouble calls and **30,074** calls handled by Customer Service
- Approximately **426,000** bills issued each year and **4,840** walk-ins per year
- Disconnection notices increased from **10,731** in 2011 to **13,956** in 2014, up **30%**.
- Implemented Springboard Health and Safety Management Program to ensure the ongoing safety of staff and the Community
- Milton Hydro has been actively participating in Region's and Town's Emergency Preparedness activities.

Finding Efficiencies and Cost Savings

Milton Hydro has worked hard to identify efficiencies and cost savings within the system. These are some of the efficiencies Milton Hydro will be focussing on in the next few years.

- **Proactive maintenance and replacement of assets** will reduce reactive maintenance costs and improve service to the customer that will result in fewer and shorter duration outages that will have a beneficial impact on the cost of outages to customers.

- **Improved use of the GIS** to capture/access asset attribute data (e.g. nameplate data, condition, inspection/maintenance histories, etc.) will aid in cost control through optimization of the asset's lifecycle.

- **Prudent investment in distribution automation** (e.g. remotely operated switches), as part of Milton Hydro's Smart Grid development, will improve day to day switching operations and have a positive impact on improving outage restoration times thereby mitigating customer outage costs.

- **Mobile equipment** (i.e. laptops) are in use that provide paperless and timely access to Milton Hydro GIS maps and service orders for work crews. During the period 2016-2020, it is intended to add GIS information, inspection programs, report forms to the mobile devices to facilitate electronic transmission of information versus paper processes.

- **Elimination of a municipal substation in 2015 through conversion to 27.6kV supply**. This will eliminate incremental losses of substation transformation losses and will allow for redistribution of maintenance resources to other system needs. Contract work associated with the substation will also be eliminated. Environmental risk due to potential transformer oil spill/fire will also be eliminated.

- **Optimized distribution feeder costs** through the agreement to use feeder positions and station capacity at Oakville's Glenorchy municipal transformer station.

- **Control room functions** have been contracted out to Guelph Hydro beginning in November 2014. This is expected to save Milton Hydro building, equipping and staffing a control room of their own. Milton Hydro's head office will be moving to a new location in 2015 due to lease expiry and availability of existing facilities. The new location is an existing building being renovated to meet Milton Hydro's needs.

Customer Feedback

16. With regards to projects focused on replacing aging equipment in poor condition, which of the following statements best represents your point of view?
    - ❑ Milton Hydro should invest what it takes to replace the system's aging infrastructure to maintain system reliability, even if that increases my monthly electricity bill by a few dollars over the next few years.
    - ❑ Milton Hydro should lower its investment in renewing the system's aging infrastructure to lessen the impact of any bill increase, even if that means more or longer power outages.
    - ❑ Don't know

17. Thinking about the aging equipment in the grid, do you feel it's best to wait until the equipment breaks down to get full value from each piece of equipment, even if it means power outages, or do you feel the best approach is to replace the equipment before it breaks down to avoid power outages, even if it means not getting all the use possible from each piece of equipment?
    - ❑ Wait until break down
    - ❑ Replace before break down
    - ❑ Don't know

18. Modernizing the grid can allow Milton Hydro to improve reliability. Investments such as automated switches may allow Milton Hydro to minimize the number of people impacted by outages and to restore electricity to most customers in a matter of seconds.

    Given there are many other areas of needed investment, such as connecting new customers, replacing aging equipment and expanding capacity for long-term growth, how important do you feel it is for Milton Hydro to invest now in modernizing the grid?
    - ❑ Very Important
    - ❑ Somewhat important
    - ❑ Not very important
    - ❑ Not important at all
    - ❑ Don't Know

19. How well do you feel you understand the cost drivers that Milton Hydro is responding to?
    - ❑ Very well
    - ❑ Quite well
    - ❑ Not very well
    - ❑ Not well at all
    - ❑ Don't know

20. In order for conservation and demand management (CDM) programs to slow the pace of system renewal and expansion, they must lower electricity consumption at peak demand. How likely is it that you would participate in CDM programs that would allow electricity system managers to turn off equipment you are using? For residential customers, this would involve automated devices to turn off your water heater and air conditioner for short periods during times of peak demand.
    - ❑ Very likely
    - ❑ Somewhat likely
    - ❑ Not very likely
    - ❑ Not at all likely
    - ❑ Don't Know

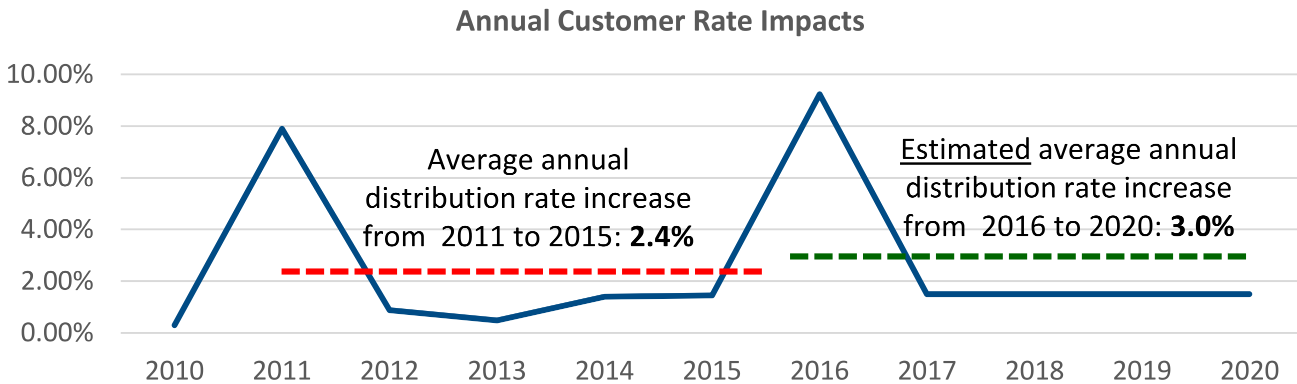
What Milton Hydro's Plan Means for You

As has been described in this workbook, Milton Hydro is funded by the distribution rates paid by its customers. Every 5 years, Milton Hydro is required to file a Cost of Service (COS) application with the Ontario Energy Board to request funding to operate and maintain the distribution system in accordance with its spending and investment plan. Milton Hydro must submit evidence to justify the amount of funding it needs to safely and reliably distribute electricity to its customers. Milton Hydro's last COS application was filed for rates effective May 1, 2011. During the years between COS applications, the OEB approves marginal increases to distribution rates.

Historical and Forecast Increases to Distribution Rates

Milton Hydro distribution rate increases between 2011 and 2015 averaged 2.4%. Each year's increase was set by the Ontario Energy Board and includes a component for inflation.

Between 2016 and 2020, distribution rates are forecast to increase an average of 3.0% per year to operate and maintain Milton Hydro's distribution system.



Estimated Typical Residential Annual Increase in Monthly Bill (5 year forecast)

To fund its 2016-2020 plan, Milton Hydro is proposing the **average residential customer's rate will increase by an estimated $0.90 per month** on the distribution portion of their bill over the next five years. So, by 2020, the average residential household will be paying an **estimated $4.52 more per month** on the distribution portion of its electricity bill.

	Year	Average Total Residential Bill *	Distribution Portion of Bill	Incremental Rate Change from Current Typical	% Change
Current Rate Period	*2015*	*$136.15*	*$28.37*	*$0.42*	*1.45%*
Forecast for next rate period †	2016	$138.77	$30.99	$2.62	9.24%
	2017	$139.23	$31.45	$0.46	1.50%
	2018	$139.71	$31.93	$0.47	1.50%
	2019	$140.19	$32.41	$0.48	1.50%
	2020	$140.67	$32.89	$0.49	1.50%

† Please note that these are preliminary estimates and are subject to change as the rate application process continues.

* Before HST

Customer Feedback

21. How well did Milton Hydro's plan cover the topics you expected?
    - ❑ Very well
    - ❑ Somewhat well
    - ❑ Not very well
    - ❑ Not well at all

22. How well do you think Milton Hydro is planning for the future?
    - ❑ Very well
    - ❑ Somewhat well
    - ❑ Not very well
    - ❑ Not well at all
    - ❑ I don't know

23. Considering what you know about the local distribution system, which of the following best represents your point of view?
    - ❑ The rate increase is reasonable and I support it
    - ❑ I don't like it, but I think the rate increase is necessary
    - ❑ The rate increase is unreasonable and I oppose it
    - ❑ I don't know

Final Thoughts

Milton Hydro values your feedback. This is the first time the utility has conducted a review about its upcoming investment plan in this type of format.

Overall Impression: What did you think about the workbook?

Volume of Information: Did Milton Hydro provide too much information, not enough, or just the right amount?

Content Covered: Was there any content missing that you would have liked to have seen included?

Outstanding Questions: Is there anything that you would still like answered?

Suggestions for Future Consultations: How would you prefer to participate in these consultations?

Glossary

Breakers: Devices that protect the distribution system by interrupting a circuit if a higher than normal amount on power flow is detected.

Distribution Station: These substations are located near to the end-users. Distribution station transformers change the voltage to lower levels for use by end-users.

Feeder Circuit: Is a wire that connects the transformer station to the broader distribution system in order to deliver electricity to customers.

General Plant: Investments in things like tools, vehicles, buildings and information technology (IT) equipment that are needed to support the distribution system.

Generation Station: A facility designed to produce electric energy from another form of energy, such as fossil fuel, nuclear, water, geothermal, solar, and wind.

GIS (Geographic Information System): A system designed to capture, store, analyze and present all types of spatial or geographical data.

Kilowatt (kW): 1000 watts.

Local Distribution Company (LDC): In Ontario, these are the companies that take electricity from the transmission grid and distribute it around a community.

OM&A: Operations, Maintenance and Administration, or operating budget.

SCADA (Supervisory Control and Data Acquisition): A system operating with coded signals over communication channels to provide control of remote equipment

Substations: These include transmission stations and distribution stations. They are used to switch generators, equipment, and circuits or lines in and out of a system. It is also used to change alternating current (AC) voltages from one level to another.

Switches: These control the flow of electricity—they direct which supply of electricity is used and which circuits are energized. Distribution systems have switches installed at strategic locations to redirect power flows for load balancing or sectionalizing.

System Access: Projects required to respond to customer requests for new connections or new infrastructure development. These are usually a regulatory requirement to complete.

System Renewal: Projects to replace aging infrastructure in poor condition.

System Service: Primarily projects that improve reliability.

Transmission lines: Transmit high-voltage electricity from the generation source or substation to another substation in the electricity grid.

Transformer: Is an important piece of equipment that reduces the voltage of electricity from a high level to a level that can be safely distributed to your area or to your residence/business.

Underground Cable: A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable).

Volt (V): A unit of measure of the force, or 'push,' given the electrons in an electric circuit. One volt produces one ampere of current when acting on a resistance of one ohm.

Watt (W): The unit of electric power, or amount of work (J), done in a unit of time. One ampere of current flowing at a potential of one volt produces one watt of power.

Wire: A conductor wire or combination of wires not insulated from one another, suitable for carrying electric current.

MILTON HYDRO DISTRIBUTION INC.

Asset Management Plan
2016 - 2020

Contents

Contents

1. Introduction

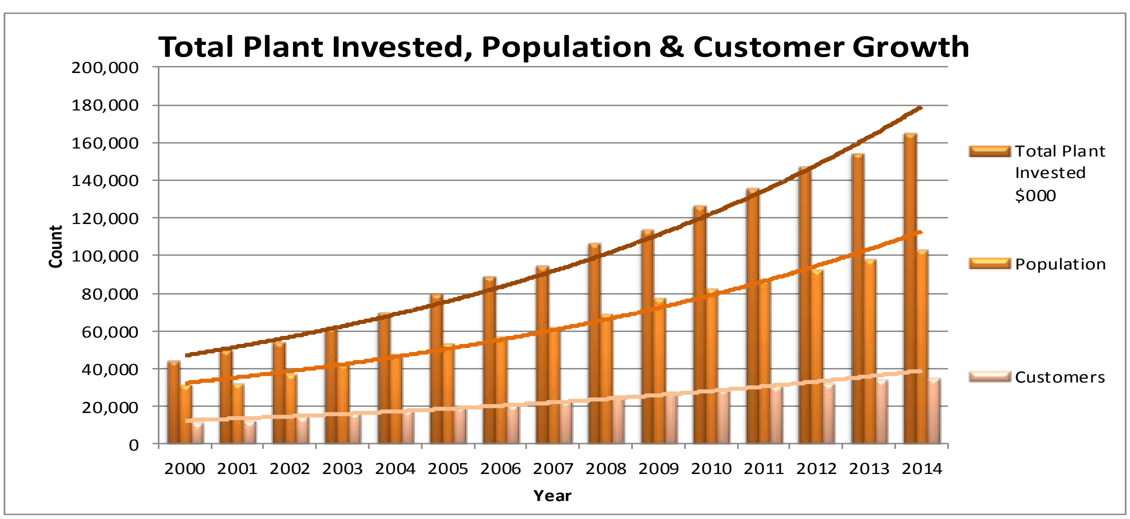
Milton Hydro Distribution Inc. (Milton Hydro-MHDI) is the local distribution company responsible for distributing electricity to residential and business customers within the Town of Milton. Milton Hydro served over 35,000 metered customers by the end 2014 and is a wholly owned subsidiary of Milton Hydro Holdings Inc. which is 100% owned by the Town of Milton. Milton Hydro is regulated by the Ontario Energy Board ("OEB") and operates in accordance with the appropriate Codes and Regulations and within the requirements set out in Distribution Licence ED-2003-0014. Milton Hydro is supplied power from five transformer stations at 44kV and 27.6kV, four owned and operated by Hydro One Networks Inc. and one owned and operated by Oakville Hydro Electric Distribution Inc.. Milton Hydro distributes electricity to the Town of Milton through a distribution network comprising of 27.6kV, 13.8kV, 8.32kV and low voltage distribution assets that include lines, transformers, poles and substations.

This document details the framework utilized by Milton Hydro to manage its Asset Management plans including new construction, capital replacements and the maintenance programs required to ensure the existing plant operates at an optimal level.

The Town of Milton ("the Town") is one of the fastest growing communities in Canada. According to the 2011 Statistics Canada Census, attached as **Appendix A**. The Town of Milton has experienced unprecedented population growth between 2001 and 2011. Milton Hydro's annual average investment in distribution plant since its growth began in 2001 has been $8.6 million.

Graph 1 shows the historical relationship between Milton Hydro's total capital investment in distribution plant and the population/customer growth from 2001 to 2014.

Graph 1 – Total Plant, Population and Customer Growth 2002-2014



Milton Hydro is committed to providing our customers with an economical, safe, reliable supply of electricity and helping the Town of Milton become the most energy efficient community in Ontario.

2. Milton Hydro Commitment to Stakeholders

We affirm to all our stakeholders that we will conduct our business in a transparent manner with respect and care for the quality of services delivered to our customers, the health and safety of our employees and the public and our impact on the environment. We will implement those strategies that build successful businesses and achieve the greatest benefit for all our stakeholders without compromising the ability of future generations to meet their needs.

We will continuously improve our practices in light of advances in technology and new understandings in reliability, safety, health and environmental science. We will make consistent, measurable progress in implementing this commitment throughout our operations.

Highest Standards of Performance, Business Excellence

We will adhere to the highest standards for the safe, reliable delivery of services. We will protect our environment, our employees, our customers and the people of the communities in which we do business.

We will strengthen our business by making reliability, safety, health and environmental issues an integral part of all business activities and by continuously striving to align our businesses with an appropriate balancing of stakeholder expectations.

Goal of Zero Injuries, Illnesses and Incidents

We believe that all injuries and occupational illnesses, as well as environmental and reliability incidents, are preventable, and our goal for all of them is zero occurrences. We will promote off-the-job safety for our employees.

We will assess the environmental impact of each facility we plan to construct and will design, build, operate and maintain all our facilities and transportation equipment so they are reliable, safe, and acceptable to local communities with minimal impact on the environment.

We will be prepared for emergencies and will provide assistance to our local communities with their emergency preparedness and response plans.

We will strive toward minimal waste generation at the source. Materials will be reused and recycled to minimize the need for treatment or disposal and to conserve resources. Where waste is generated, it will be handled and disposed of safely and responsibly.

We will strive toward minimizing emissions and are dedicated to the elimination of pollutants, giving priority to those that may present the greatest potential risk to health or the environment.

Where past practices have created conditions that require correction, we will responsibly correct them.

We will excel in the efficient use of energy, water and other natural resources.
We will manage our land use to minimize impacts on their habitats.

We will promote open discussion with our stakeholders about their needs and the service we provide, the materials we use and transport and the impacts of our activities on their safety, health and environment.

We will build alliances with governments, policy makers, businesses and advocacy groups to develop sound policies, laws, regulations and practices that improve reliability, safety, health and the environment.

Management and Employee Commitment, Accountability
The Board of Directors, including the President and Chief Executive Officer, will receive quarterly reports on pertinent reliability, safety, health and environmental issues and will ensure that policies are in place and actions taken to achieve this commitment.

Compliance with this commitment and applicable laws is the responsibility and a condition of employment of every employee and contractor acting on Milton Hydro's behalf. Management is responsible to educate, train and motivate employees and contractors to understand and comply with this commitment and applicable laws.

3. Asset Management

Overview

Milton Hydro has established a comprehensive system of inspection and measurement as a means of continually assessing its distribution business and achieving consistency with its commitment to stakeholders. System performance reports deliver the information necessary to satisfy the requirements of the Ontario Energy Board's (OEB) Distribution System Code (DSC) as well as Milton Hydro's own internal needs. Milton Hydro has developed reporting mechanisms that are focused on continuous performance improvements which ensure the availability of long term capacity to meet the needs of a growing community, enable the effective and successful management of all distribution assets and fulfill Milton Hydro's regulatory obligations.

Milton Hydro regards asset management as a critical driver of the distribution systems' longer term performance. Senior management is committed to the asset management philosophy and ensures that sufficient resources are allocated to support the asset management process. This requires an ongoing investment in resources and personnel to complete the annual planning, inspecting, reporting, and implementation activities associated with the various asset management processes. The quality and consistency of those processes and the resulting data is critical for a successful asset management plan. The responsibility for the continuous management of the strategy rests with the Senior Management team as the Asset Manager. The Asset Manager's responsibilities primarily involve risk management and ensuring that:

- The inspection process is organized with assets identified in reasonable zones and segments.
- Inspections and follow up maintenance is being effectively organized and performed.
- Records are accurate and current including those in the GIS.
- Condition analysis is completed correctly.
- Potential Maintenance and Capital Budget recommendations are incorporated into the planning process.
- The condition of the distribution system is reviewed to ensure system reliability efforts are implemented in the most cost effective manner for the short, medium and long term.

Milton Hydro operates a distribution system comprised of high voltage networks at 27.6kV, 13.8kV, and 8.32kV. Outage data is monitored and information accumulated on the performance of all feeders at the three voltage levels. This data is reviewed and analyzed with attention focussed on identifying those causes that negatively impact system reliability and the continuity of supply. Any pattern of system failures that is attributable to the same root cause is identified, analysed and used to prioritize capital projects and maintenance programs.

The Asset Management Plan is a source input to the maintenance budget and capital investment proposals.

Inspections and Assessments

The DSC encourages good utility practices and mandates a defined approach to distribution system inspections. Milton Hydro has incorporated the DSC requirements into its internal processes as a means of continually monitoring its facilities and ensuring the performance level of the distribution system does not degrade.

Asset Management Considerations and Priorities

To provide service levels that are consistent with its commitment to stakeholders, Milton Hydro manages its assets so that appropriate performance levels are achieved and customer's expectations for safe, reliable electricity delivered at a reasonable price are respected and incorporated into our planning processes. The following considerations help Milton Hydro to balance and address the various expectations from an asset management perspective:

- Asset Management should create opportunities for improved efficiencies.
- The activities should demonstrate good stewardship of the distribution system.
- Service delivery should be safe, fair and consistent within all customer groups.
- Any performance improvements should demonstrate a good balance between the achievement of goals and budgetary requirements.
- Maintenance plans should be consistent with good utility practice and incorporate the results from annual assessments and customer needs.
- Capital investment plans should justify proposed expenditures and be able to respond to new priorities and changing capital drivers.
- Annual reviews of asset management processes.

Risk Management

Risk management is a fundamental activity in any business and in the electrical distribution industry it requires a systematic approach to assess the following attributes of each asset:

- Condition
- Risk exposure
- Age and life expectancy
- Location
- Operational data, and
- Maintenance

Milton Hydro takes such a systematic approach to identify and mitigate risk to its assets and distribution system.

4. Inspections and Condition Assessments

The Minimum Inspection Requirements (Appendix B of the DSC) details the inspection standards and inspection cycles required of all distributors. Table C-1 identifies the maximum intervals for inspection cycles, which for most urban facilities is 3 years, for rural facilities is 6 years and for stations is 1 year, 3 years or 6 months. A definition of Patrol Inspection is included on the first page of Appendix B of the DSC.

Milton Hydro's inspection of its major distribution facilities, as noted below, is comprehensive and at a level of detail that satisfies the requirements established by the OEB's Patrol Inspection definition. In addition to fulfilling the OEB's cyclical inspection requirements, Milton Hydro's inspection process enables the identification and documentation of condition-related deficiencies, which, taken together with the subsequent analysis process, results in a framework that supports maintenance and capital expenditures for the various distribution assets. A thorough understanding of the condition of existing assets is critical in order to maximize asset life, improve efficiencies, improve reliability by reducing failures, plan for proper capital replacement, and enact maintenance programs that help to ensure the safety of both employees and the general public.

Overhead Systems

Milton Hydro systematically inspects its overhead distribution system, completing approximately one-third of its distribution system each year, as per Appendix B 'Minimum Inspection Requirements' of the DSC. The visual patrol serves as an inspection to assess the condition of overhead assets, including wood/concrete poles and their supports and attachments, pole-mount distribution transformers, switches and surrounding vegetation.

Inspections results are documented through the Overhead Distribution System Inspection forms included in **Appendix B** of this document.

Underground Systems

Similar to the general overhead process of inspection and condition assessment, the underground distribution system is also inspected on a 3 year cyclical basis to assess the condition of underground assets including pad-mount transformers, submersible transformers, transformer vaults and adjacent civil structures. Specific attention is given to the following elements of the underground system.

A. Underground Vault Inspection

Underground vaults are inspected on a 3 year cycle and cleaned and pressure washed as required. An inspection checklist is completed and returned to Engineering for record keeping and follow up purposes as required. The Transformer Maintenance Inspection Checklist attached in **Appendix C** is used for recording vault inspections and initiating any required maintenance.

B. Switching Cubicle Cleaning and Inspection

Milton Hydro has approximately 75 switching cubicles which are inspected and maintained every 3 years. For air insulated switching cubicles the process may include dry ice cleaning which involves a high pressure blast of CO_2/dry ice vapor to clean the cubicles. The process removes contamination from the insulating components of the switches as well as providing an overall cleaning of the switching cubicle. Milton Hydro contracts this work out and receives a full report on the work performed and any concerns or deficiencies that require Milton Hydro's attention. The Switching Cubicle Maintenance Checklist is shown in **Appendix D**.

C. Transformer Room Inspections

Milton Hydro has 107 distribution transformers installed in locked rooms within various buildings throughout the Town of Milton; access to these rooms is only available to Milton Hydro employees. These transformer rooms are checked regularly to ensure they remain locked and have not been tampered with. Milton Hydro line staff inspects and maintains the transformer rooms every 3 years as part of the pad-mount transformer inspection program. Transformer rooms are maintained but are no longer used for new additions to the distribution system.

D. Pad-mount Transformer Inspection

Milton Hydro has approximately 2,628 pad-mount transformers, 470 submersible transformers and 107 transformer room transformers within its distribution system. These transformers are divided into 3 groups and inspected on a 3 year cycle. Milton Hydro line staff performs the inspections and complete a Transformer Maintenance Inspection Checklist, included in **Appendix C**, which is returned to the Operations Department for follow up as required.

E. Substations

As with the overhead and underground distribution system, Milton Hydro inspects and assesses all of its substations on an ongoing basis. All substations are inspected monthly by Milton Hydro Operations staff. Inspection findings are captured by the Substation Maintenance Checklist, included in **Appendix E**, and returned to the Engineering Department for follow up and records purposes. The substation inspection process supports short and long term maintenance and capital planning activities.

5. Maintenance Programs

Preventative maintenance, when properly carried out, helps to minimize possible distribution plant failures and improve system reliability and performance.

Depending on the level of specialization required, planned maintenance activities may be carried out by Milton Hydro line staff or contracted out to an external supplier. Any deficiencies reported are reviewed and prioritized by Engineering and Operations staff to determine whether reactive maintenance is required or if the work can be scheduled as a component of a future capital project or planned maintenance. The following maintenance programs are an integral part of Milton Hydro's asset management activities:

A. Straighten Poles and Add Anchors

During routine capital and maintenance work Milton Hydro staff record the location of poles that are leaning and/or require the addition of anchors. Milton Hydro also responds to notice from the public of potential pole hazards. An Instruction Order detailing the concern is prepared and issued to the Operation Department for follow up.

B. Infrared Thermography

This is an annual maintenance program. An independent contractor scans all of Milton Hydro's overhead plant, including approximately 2,650 overhead transformers, as a means of detecting 'hot spots', which are system weak spots that lead to equipment failure.

Milton Hydro receives a written report that details the location, the extent of the temperature rise and the severity of the hot spot. Milton Hydro engineering staff then issue work instructions based on a prioritization of the inspection results. This is a program used to proactively detect and prevent unnecessary failures and equipment damage.

A sample Infrared Thermography report is included in **Appendix F**.

C. Tree Trimming – Vegetation Management

Milton Hydro has divided its service area into three geographic areas as shown in **Appendix G**. Each area is trimmed at least on a 3 year cycle and more frequently if required. Milton Hydro tenders the work annually to a qualified utility arborist. Maps are provided to the contractor and Milton Hydro personnel inspect the contractor's work. This proactive approach reduces the number of tree related power outages during stormy conditions and minimizes the possibility of inadvertent tree contacts, with energized distribution lines, during moderate weather conditions. Milton Hydro enhanced its tree trimming specifications in 2014 to include type of tree and growth cycle after some lessons learned from the December 2013 ice storm.

Milton Hydro also responds to requests from the public to remove or trim trees that are growing into the power lines.

D. Pole Test - Inspection

Milton Hydro has approximately 8,745 wood poles and 710 concrete poles within its distribution system which are inspected every 3 years as stipulated by the DSC's minimum inspection requirements. Dependent on age and condition, poles are either tested or visually inspect to satisfy the 3 year. The 3 year pole testing cycle is scheduled based on the geographic areas shown in **Appendix H**. Milton Hydro contracts out the pole test - inspections to a qualified independent third party who inspects and tests all poles to determine the overall condition of individual poles. The contractor submits the detailed results of the pole test program to Milton Hydro via an Access database and a summary report, a screen shot of the database has been included in **Appendix I**. Poles requiring immediate replacement are changed in the current year on a priority basis. Those poles requiring replacement within the next year are scheduled to be replaced as part of the following year's budget.

In addition to inspecting, testing and assessing poles, the contractor also visually inspects cross arms and other hardware for any signs of abnormal conditions.

Milton Hydro Operations staff also report poles that are found damaged or in need of replacement. An Instruction Order, included in **Appendix J**, is prepared by Operations and issued to the line crews accordingly.

E. Insulator Washing

Milton Hydro has both polymer and porcelain insulators in its distribution system. Porcelain insulators continue to be replaced with polymer insulators as a means of enhancing system performance, the work is performed either as a distinct project or in combination with other capital or maintenance work. Insulator washing may be required in high traffic areas, such as the vicinity adjacent to Highway 401, where contamination is more prevalent. When required, Insulator washing is scheduled based on the level of contamination and the resulting impact on system reliability. With an increased population of polymer insulators, the need for insulator washing is reduced.

F. Overhead Switch Maintenance

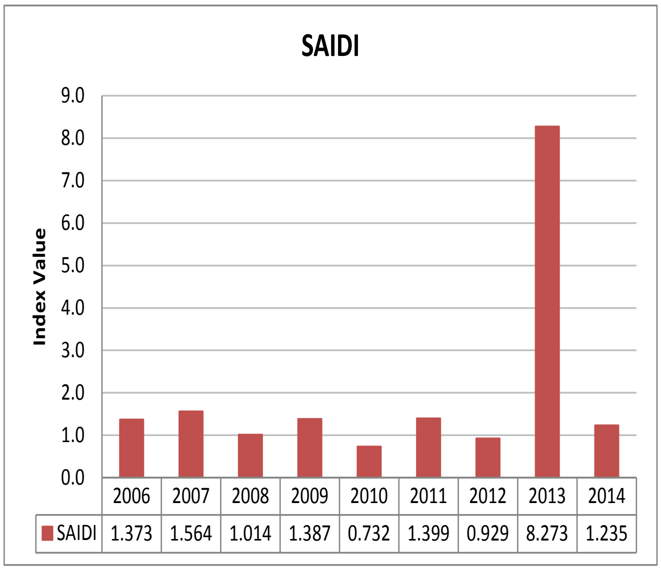
All overhead switches are visually inspected over a three year period as required by the DSC. Any deficiencies identified as part of the inspection are corrected on a priority basis. Beyond the inspection process, a switch maintenance program is conducted over a five year cycle by Milton Hydro line crews or contractors. A Switch Maintenance Checklist, included in **Appendix K**, is completed, and all findings are reviewed for additional follow-up. Depending on the maintenance program results, any additional work generated is performed either on a reactive basis, as part of a maintenance schedule, or as part of planned capital work. The switch maintenance program ensures that the switches will function reliably and safely at all times.

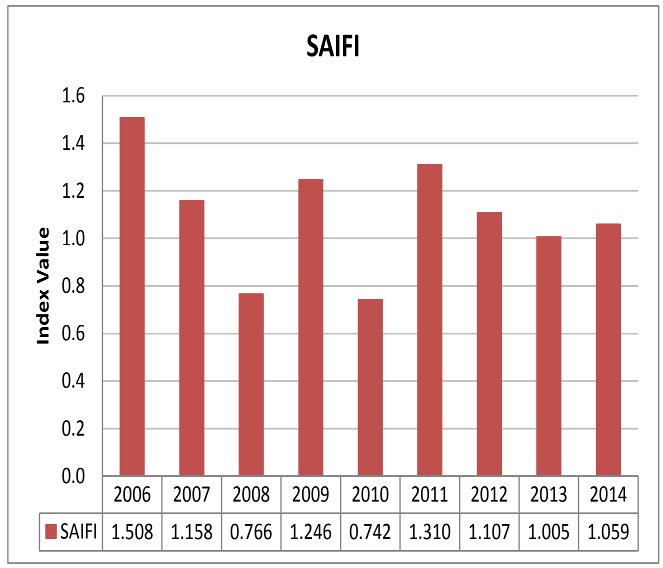
6. System Performance

Milton Hydro assesses the performance of its distribution system through a regular review of its Service Quality Indicators ("SQIs"). Monthly tracking of system SQIs provide a statistical measure of system performance in the three areas noted below. Milton Hydro's Engineering and Operations staff review the statistical data to gauge ongoing system performance levels, including changes in reliability levels, failure trends and associated causes, and take corrective action as required. The SQI's are reported to Milton Hydro's Board as part of the regular Board Reports.

System Average Interruption Duration Index = Total Customer-Hours of Interruptions
(SAIDI) Total Customers Served

System Average Interruption Frequency Index = Total Number of Interruptions
(SAIFI) Total Customers Served





7. Environmental Responsibilities

Milton Hydro's Commitment to Stakeholders includes ensuring that Milton Hydro does not negatively impact the environment. Milton Hydro complies with all environmental legislation and regulations and ensures personnel are properly trained to recognize environmental hazards.

8. Documentation/Data Analysis

Milton Hydro's distribution assets are recorded primarily in electronic asset registers. The data from the various asset registers can be displayed geospatially on Milton Hydro's Esri Geographic Information System ("GIS"). This data is used to help establish inspection cycles and track asset information. As assets are replaced, pole and transformer details are captured in detail on the GIS, other assets' details are also captured as part of installation drawings and project documentation.

All inspection results are captured electronically, inspection results are either scanned into Milton Hydro's document management system or stored as part of some other software package; as an example, an Access database is used to document pole testing results.

In 2012, Milton Hydro purchased Esri's Geographic Information System ("GIS") thereby acquiring enhanced data management capabilities. Where appropriate, greater access to data will facilitate asset management initiatives and support operational efforts such as outage response efforts by utilizing common database elements between the Customer Information System ("CIS") and the GIS system.

Milton Hydro maintains the following records in support of its inspection and maintenance programs as provided in Table 1.

Table 1 – Maintenance Records

Document Retention
InfraRed Scan System Connections, TX's
Insulator Washing
OEB-Distribution System Code-Inspection
Overhead Switch Maintenance
Padmount Transformer Inspection & Mtce Urban/Rural
Pole Testing
Straighten Poles & Add Anchors
Substation Maintenance Checklist
Switching Cubicle Cleaning & Inspection
Vault Inspection
Transformer Room Inspections & Maintenance
Tree Trimming – 3 Year Cycle

9. System Planning/Performance Considerations

The Town of Milton continues to experience very high rates of growth requiring Milton Hydro to maintain close relationships with staff at the Town and the Region of Halton. Long range development plans are closely reviewed and incorporated into load growth projections that are critical for both internal capacity planning and joint capacity studies with Hydro One. The resulting projects are evaluated and prioritized along with projects driven by other needs such as distribution plant renewal, reliability driven projects, or other growth related projects.

All of the above contribute to the maintenance budgets and the capital investment planning process described below.

10. Inspection and Maintenance Plans 2016 to 2020

Milton Hydro's inspection and maintenance plans have been developed as part of Milton Hydro's Commitment to Stakeholders to deliver reliable service while maintaining the highest safety standards possible.

Operations and maintenance budgets are developed as budgetary forecasts of routine and non-routine operations and maintenance activities for the upcoming year. Operations and maintenance costs are captured by the appropriate OEB accounts and include overhead, underground and substation inspections, reactive and preventative maintenance, and general system maintenance. Routine activities occurring annually, such as vegetation management, are forecasted annually with the help of historical experience and figures. As part of the ongoing review process these forecast values are adjusted to reflect the most current scope of work and price information. These expenditures are forecasted based on either an estimate of internal labour hours required to complete the activity or, alternatively, estimated based on proposals or quotations. For routine activities occurring on a cyclical basis, associated expenditures are only included within the operations and maintenance budget for the year in which the activity is scheduled to be performed. While the majority of operations and maintenance activities are recurring, non-routine or single occurrence expenditures may be warranted to reflect changes to performance priorities or new operations and maintenance programs. These non-routine maintenance activities typically undergo an internal review process that explores the drivers and costs associated with the deviation from past operational and maintenance activities. Lastly, administrative expenditures, such as staff training, are identified and included prior to completion of the budget.

A. Planned Overhead

Table 2 details Milton Hydro's routine annual overhead maintenance schedule.

Table 2 – Maintenance Schedule

OVERHEAD		Priority	2016	2017	2018	2019	2020
A	Straighten Poles & Add Anchors (1 year)	Safe/Rel.	X	X	X	X	X
B	Infrared Scan System, Connections TX's (1 year)	Safe/Rel.	X	X	X	X	X
C	Tree Trimming (3 year cycle)	Safe/Rel.	X	X	X	X	X
D	Pole Inspection and Testing (3 year cycle)	Safe/Rel.	X	X	X	X	X
E	Insulator Washing (as required)	Safe/Rel.					
F	Overhead Switch Inspection & Maintenance	Safe/Rel.	X			X	
G	OEB - Distribution System Code - Inspection	Safe/Rel.	X	X	X	X	X

B. Planned Underground

Table 3 details Milton Hydro's routine annual underground maintenance schedule.

Table 3 – Underground Maintenance Schedule

UNDERGROUND		Priority	2016	2017	2018	2019	2020
A	U/G Vault Inspection (3 year cycle)	Safe/Rel.	X	X	X	X	X
	Dorset Park Area (120 Vaults)				X		
	Timberlea (125 Vaults)		X			X	
	Bronte Meadows (130 Vaults)			X			X
B	Switching Cubicle Inspection (3 year cycle)	Safe/Rel.			X		
C	Transformer Room Inspections (3 year cycle)	Safe/Rel.			X		
D	Padmount TX Inspection (3 year cycle)	Safe/Rel.	X	X	X	X	X

C. Planned Substations

Table 4 details Milton Hydro's substation maintenance schedule.

Table 4 – Substation Maintenance Schedule

SUBSTATIONS		Priority	2016	2017	2018	2019	2020
MS #4 T1 & T2		Reliability					
	Breakers, Cubicles, Relays & Transformer Tests		X				
MS #6		Reliability					
	Structure, On Load Tap Changer & Transformer				X		
MS # 7		Reliability					
	Structure, Transformer & Reclosers			X			X
Regulator MRS #7		Reliability					
	Regulator & Tap Changer Maintenance, Oil Analysis			X			X
Regulator MRS #10		Reliability					
	Regulator & Tap Changer Maintenance, Oil Analysis			X			X
MS #9		Reliability					
	Structure, Transformer & Reclosers			X			X
3-1 ph Regulators at Derry & Guelph		Reliability					
	Regulator & Tap Changer Testing, Oil Analysis		X			X	
Transformer Oil Tests (All Substations & Regulators)		Reliability					
	Standard 5 Part ASTM Oil Analysis		X	X	X	X	X
	Dissolved Gases in Oil Analysis		X	X	X	X	X
Battery Maintenance & Inspection - All Stations		Reliability	X	X	X	X	X

11. Capital Investments - 2016

Milton Hydro's capital investment plans are prepared and updated as part of the annual budgeting process and are driven by the need to meet the capacity and security (of supply) needs of existing and future customers. Milton Hydro manages its physical infrastructure by integrating best practices in all aspects of selection, design, construction, operation, maintenance and replacement. As noted above, condition assessments are carried out that exceed the minimum inspection requirements of the DSC and include visual inspections, pole testing, infra-red scanning and regularly scheduled maintenance to identify those assets which require immediate attention as a means of ensuring reliable and safe operation of the distribution system. Those assets requiring attention are then scheduled accordingly for repair or replacement as part of the Asset Management Plan and budgeting process.

Milton Hydro has identified areas of older 13.8kV plant that will need to be upgraded to 27.6kV as part of various system projects required to meet growth, sustainability and reliability requirements.

A system of project prioritization is applied that takes into account growth rates, safety, reliability and performance, condition and age, and other drivers internal or external to Milton Hydro. Projects are categorized as one of 'high', 'medium-high', 'medium', 'medium-low' or 'low' based on these considerations. **Appendix L** includes a copy of a capital project template that Milton Hydro utilizes as a means of capturing project specific information. The table below provides examples of capital investment drivers and corresponding priority levels:

HIGH	New development/Regulatory/Municipally-driven project(s)
	Infrastructure renewal project(s) where assets are at end-of-life or present a health or environmental risk
	System reliability, supply/capacity or contingency planning project(s)
MED-HIGH	Infrastructure renewal project(s) where assets are nearing end-of-life
	Specific or small-scale system reliability, supply/capacity or contingency planning project(s)
	Distribution Automation project(s)
	Tools/Fleet/Internal System-related project(s)
MEDIUM	Replacement of obsolete/vintage plant project(s)
	System Optimization
	System Studies
MED-LOW	Rebuild of non-standard design project(s)
LOW	Unique, ‘one-off’ project(s)

Based on the criterion described, a capital investment plan has been prepared for the current year and going forward for a period of five years. Project specific plans are developed to ensure the prudent replacement of distribution system assets before they begin to fail thereby maintaining the system reliability and safety Milton Hydro customers have come to expect.

The capital investment requirements are driven by various considerations as follows:

- Development and growth experience
- Town and Regional demands such as road widening/expansions
- Capital replacement requirements
- Unplanned or reactive capital replacement

By reviewing and prioritizing forecast projects using the above framework, Milton Hydro has developed a capital projects list. This is a dynamic list and will change as project expectations or drivers change, in particular the longer term projects will experience ongoing review and modifications as conditions evolve.

The proposed 2016 capital investment plan is shown below. The cost of each project is Milton Hydro’s best estimate and subject to revision as additional information becomes available.

12. Conclusion

Milton Hydro recognizes that any asset management plan will not remain static; changes to the distribution system occur as a result of different variables such as abnormal weather, premature equipment failure, and growth requirements. This plan is forward looking and takes into account the available assets information, planned projects, changes to municipal and regional planning, and future development. As additional information is gathered, changes to Milton Hydro's long term plans may be required as a result of Milton Hydro's ongoing focus on service quality indicators ("SQIs") or as a result of externally driven projects.

Milton Hydro's asset management strategy is designed to deliver the continued reliability and system security required to ensure a safe and reliable supply of electricity to the Town of Milton and to meet Milton Hydro's commitment to all customers, employees and shareholder.

2016 Capital Plan

Capital Works Budget Year 2016		BUDGET		
MHDI Capital Works Projects - 2016	**Investment Driver**	**Job Total (Gross)**	**Capital Contribution**	**Job Net**
SYSTEM ACCESS - 2016 Regional, Municipal Driven Capital Projects				
ROH Steeles Av Grade Separation at CN Crossing west of Bronte St	3rd party infrastructure	$90,600	$44,400	$46,200
ROH Steeles Av widening from Industrial Dr to Martin St 2 to 4 lanes	3rd party infrastructure	$284,500	$60,000	$224,500
ROH: Britannia Rd from RR 25 to JSP 2 to 4 lanes(3.5km)	3rd party infrastructure	$1,004,800	$241,600	$763,200
Town LSL from Yates Dr to RR25	3rd party infrastructure	$32,700	$10,800	$21,900
Town Garden Lane, 400m total, 100m of which is 3 phase	3rd party infrastructure	$133,000	$34,700	$98,300
Town 5th Line from LSL to Derry Rd, 1.5km	3rd party infrastructure	$415,200	$111,700	$303,500
Town 5th Line from LSL to Britannia, 1.5km	3rd party infrastructure	$397,000	$103,500	$293,500
ROH: Britannia from Tremaine to RR25 (1.8Km)	3rd party infrastructure	$403,300	$98,300	$305,000
Town: Bronte St From Britannia to LSL	3rd party infrastructure	$389,900	$85,200	$304,700
Meters	Customer service request	$293,926	$0	$293,926
Customer Connections	Customer service request	$681,587	$681,587	$0
Subdivision Develoment (1,500 units)	Customer service request	$3,780,000	$1,993,700	$1,786,300
		$0	$0	$0
		$0	$0	$0
Sub Total		**$7,906,513**	**$3,465,487**	**$4,441,026**
SYSTEM RENEWAL - 2016				
Pole Replacement Program - 100 poles	Failure Risk	$500,000	$0	$500,000
Porcelain to Poly Program	Failure Risk	$150,000	$0	$150,000
Derry Rd, Trafalgar to 8th Line	Failure Risk, System Efficiency	$155,000	$0	$155,000
Sixth Line Nass South of 25 Side Road	Failure Risk, System Efficiency	$322,000	$0	$322,000
Sixth Line Nass North of 20 Side Road	Failure Risk	$321,400	$0	$321,400
U/G Main and Commercial UG Rebuild	Failure Risk	$65,000	$0	$65,000
Misc System Renewal	Failure Risk	$350,000	$0	$350,000
		$0	$0	$0
		$0	$0	$0
Sub Total		**$1,863,400**	**$0**	**$1,863,400**
SYSTEM SERVICE - 2016				
WiMax - Automate Switches	Operational efficiency; reliability	$120,000	$0	$120,000
WiMax - 100 Meter Points	System efficiency; reliability	$650,000	$0	$650,000
Automated Fault Indicator Installation - with WiMAX	Operational efficiency; reliability	$175,000	$0	$175,000
Install Automated Switches with WiMAX	Operational efficiency; reliability	$194,000	$0	$194,000
		$0	$0	$0
		$0	$0	$0
Sub Total		**$1,139,000**	**$0**	**$1,139,000**
DISTRIBUTION PLANT SUB TOTAL		**$10,908,913**	**$3,465,487**	**$7,443,426**
GENERAL PLANT - 2016				
Rolling Stock	System capital investment support	$510,000	$0	$510,000
Computer Software	Business operations efficiency	$50,000	$0	$50,000
Computer Hardware	Business operations efficiency	$83,000	$0	$83,000
Stores Equipment	Business operations efficiency	$68,000	$0	$68,000
Major Tools	System capital investment support	$9,500	$0	$9,500
		$0	$0	$0
		$0	$0	$0
Sub Total		**$720,500**	**$0**	**$720,500**
TOTAL		**$11,629,413**	**$3,465,487**	**$8,163,926**

Appendix A – Statistics Canada, 2011 Census Information

Source:
http://www12.statcan.gc.ca/census-recensement/2011/as-sa/fogs-spg/Facts-csd-eng.cfm?LANG=Eng&GK=CSD&GC=3524009

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- ARCHIVED - 2001 Census of Population
- ARCHIVED - 1996 Census of Population

Future censuses
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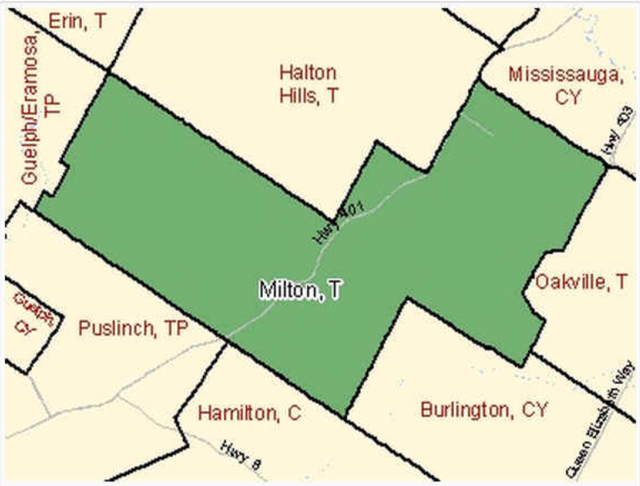
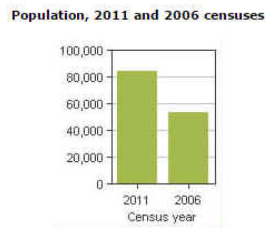
Census subdivision of Milton, T - Ontario 1



Map of Milton, T
Interactive version of map



Prov. rank	Nat. rank
29	62

In 2011, Milton (Town) had a population of 84,362, representing a percentage change of 56.5% from 2006. This compares to the national average growth of 5.9%.

Land area is 363.22 square kilometres with a population density of 232.3 persons per square kilometre. This compares to the provincial land area of 908,607.67 square kilometres with a population density of 14.1 persons per square kilometre.

In 2011, Milton (Town) had 27,561 private dwellings occupied by usual residents. The change in private dwellings occupied by usual residents from 2006 was 49.6%. For Canada as a whole, the number of private dwellings occupied by usual residents increased 7.1%.

Milton (Town) is part of the census metropolitan area of Toronto.

Milton (Town) – Neighbouring census subdivisions

Census subdivision (CSD) name	CSD type	Population		
		2011	2006	% change
Mississauga, Ont.	CY	713,443	668,599 A	6.7
Puslinch, Ont.	TP	7,029	6,689	5.1
Guelph/Eramosa, Ont.	TP	12,380	12,066	2.6
Oakville, Ont.	T	182,520	165,613	10.2
Burlington, Ont.	CY	175,779	164,415	6.9
Halton Hills, Ont.	T	59,008	55,289	6.7
Hamilton, Ont.	C	519,949	504,559	3.1

Table 1 Milton (Town) – Neighbouring census subdivisions, population change, 2006 to 2011

Ontario – Census subdivisions with 5,000-plus population with the highest population growth

Census subdivision (CSD) name	CSD type	Population		
		2011	2006	% change
Milton	T	84,362	53,889 A	56.5
Whitchurch-Stouffville	T	37,628	24,390	54.3
Ajax	T	109,600	90,167	21.6
Brampton	CY	523,911	433,806	20.8
Vaughan	CY	288,301	238,866	20.7

Table 2 Ontario – Census subdivisions with 5,000-plus population with the highest population growth, population change, 2006 to 2011

Ontario – Census subdivisions with 5,000-plus population with the lowest population growth

Census subdivision (CSD) name	CSD type	Population		
		2011	2006	% change
Thunder Bay, Unorganized	NO	5,909	6,585	-10.3
Hearst	T	5,090	5,620	-9.4
Dryden	CY	7,617	8,195	-7.1
The Blue Mountains	T	6,453	6,825	-5.5

Table 3 Ontario – Census subdivisions with 5,000-plus population with the lowest population growth, population change, 2006 to 2011

Age and sex

Milton, T – Age distribution

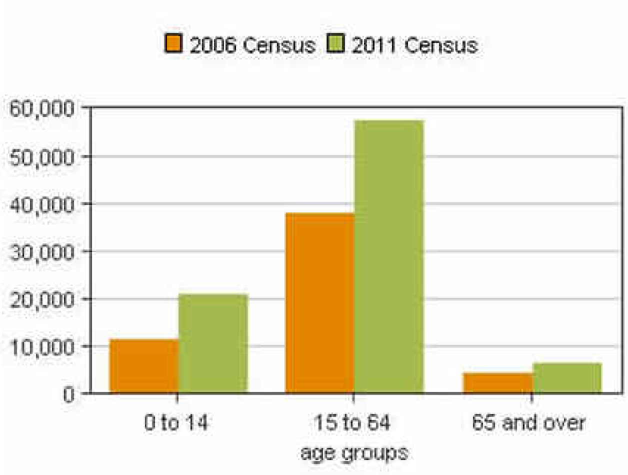


Table 4 Milton, T – Age distributions by broad age groups and sex, 2011 Census

Age groups	Both sexes	Males	Females
0 to 14	24.6%	25.6%	23.6%
15 to 64	67.8%	67.3%	68.2%
65 and over	7.6%	7.1%	8.2%

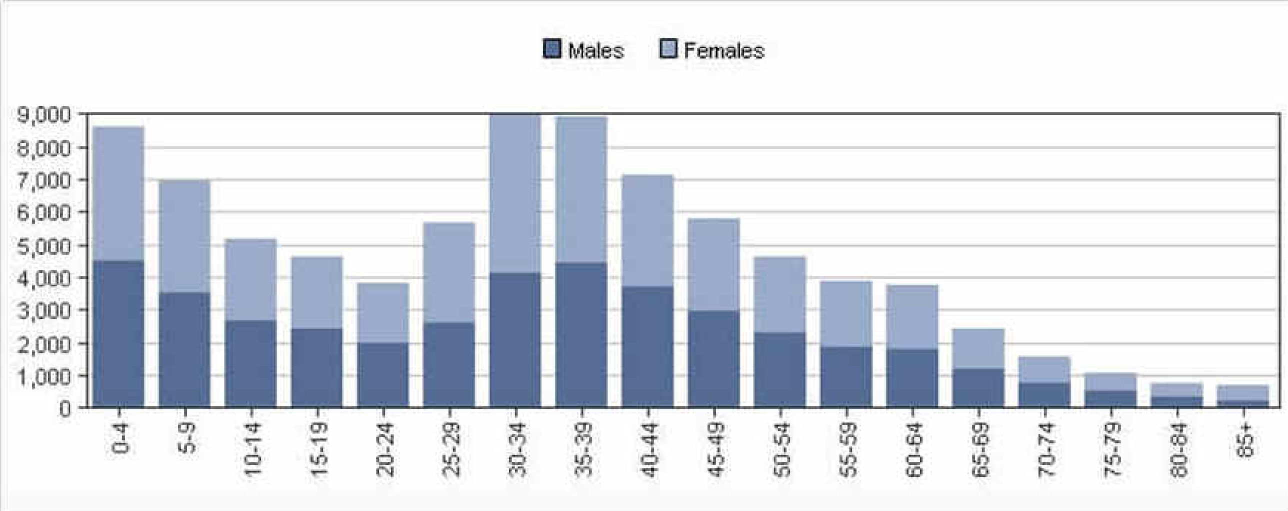
In 2011, the percentage of the population aged 65 and over in Milton, T was 7.6%, compared with a national percentage of 14.8%. The percentage of the working age population (15 to 64) was 67.8% and the percentage of children aged 0 to 14 was 24.6%. In comparison, the national percentages were 68.5% for the population aged 15 to 64 and 16.7% for the population aged 0 to 14.

Milton, T – Population by broad age groups and sex

	Population			
Broad age groups by sex	**2011**	**2006**	**change**	**% change**
Both sexes				
Total	84,360	53,885	30,475	56.6
0 to 14	20,750	11,505	9,245	80.4
15 to 64	57,160	37,905	19,255	50.8
65 and over	6,450	4,480	1,970	44.0
Males				
Total	41,805	26,900	14,905	55.4
0 to 14	10,705	5,950	4,755	79.9
15 to 64	28,135	18,945	9,190	48.5
65 and over	2,965	2,005	960	47.9
Females				
Total	42,560	26,985	15,575	57.7
0 to 14	10,045	5,555	4,490	80.8
15 to 64	29,025	18,960	10,065	53.1
65 and over	3,490	2,475	1,015	41.0

Table 5 Milton, T – Population by broad age groups, sex and population change between 2006 and 2011, 2006 to 2011 censuses

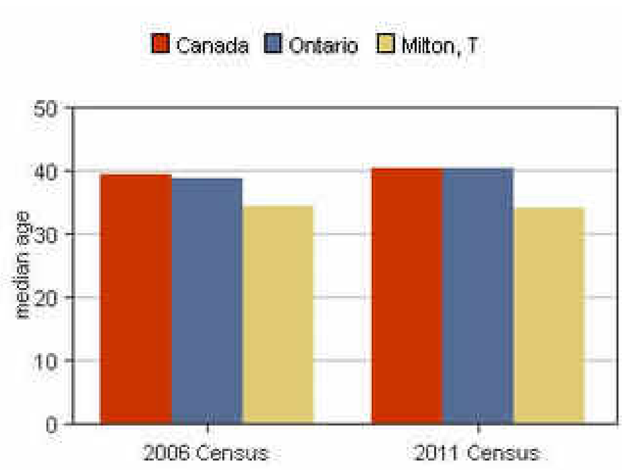
Milton, T – Population by five-year age groups and sex



Age groups	Both sexes	Males	Females
Total - Age groups	84,360	41,805	42,560
0 to 4 years	8,615	4,505	4,110
5 to 9 years	6,950	3,530	3,420
10 to 14 years	5,180	2,670	2,510
15 to 19 years	4,625	2,390	2,240
20 to 24 years	3,835	1,960	1,870
25 to 29 years	5,690	2,580	3,105
30 to 34 years	8,955	4,135	4,820
35 to 39 years	8,915	4,445	4,465
40 to 44 years	7,115	3,710	3,410
45 to 49 years	5,775	2,960	2,820
50 to 54 years	4,595	2,270	2,330
55 to 59 years	3,905	1,875	2,025
60 to 64 years	3,750	1,810	1,935
65 to 69 years	2,400	1,175	1,225
70 to 74 years	1,560	760	800
75 to 79 years	1,040	490	555
80 to 84 years	760	310	445
85 years and over	690	220	470
Median age	34.1	34.0	34.2

Table 6 Milton, T – Population by five-year age groups and sex, 2011 Census

Milton, T – Median age[2] of the population



In 2011, the median age in Milton, T was 34.1 years. In comparison, the median age of Ontario was 40.4 years.

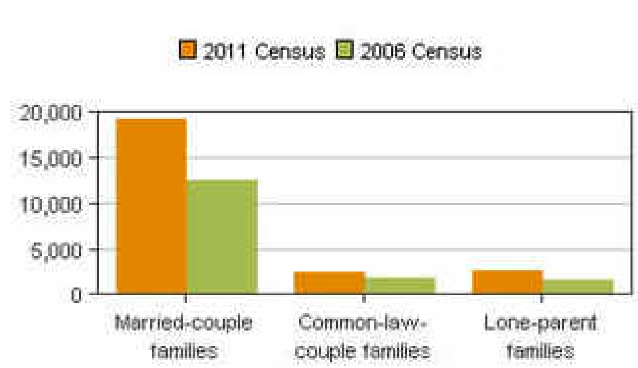
	Median age	
	2006	2011
Canada	39.5	40.6
Ontario	39.0	40.4
Milton, T	34.4	34.1

Table 7 Canada, Ontario and Milton, T – Median age, 2006 and 2011 censuses

Families and households

In 2011, the number of census families[3] in Milton was 24,295, which represents a change of 52.9% from 2006. This compares to a growth rate for Canada of 5.5% over the same period.

In Milton, 79.1% of census families were married couples in 2011, while 10.0% were common-law-couples and 10.9% were lone-parent families.



Geographic name	Total families	Married-couple families		Common-law-couple families		Lone-parent families		% change, census families, 2006 to 2011
		number	%	number	%	number	%	
Canada †	9,389,695	6,293,950	67.0	1,567,905	16.7	1,527,840	16.3	5.5
Ontario †	3,612,205	2,612,890	72.3	394,670	10.9	604,645	16.7	5.5
Milton, T	24,295	19,210	79.1	2,435	10.0	2,650	10.9	52.9
Mississauga, CY	199,380	154,440	77.5	12,160	6.1	32,780	16.4	6.8
Puslinch, TP	2,180	1,805	82.8	225	10.3	150	6.9	9.5
Guelph/Eramosa, TP	3,725	3,030	81.3	370	9.9	330	8.9	4.8
Oakville, T	51,665	41,730	80.8	3,290	6.4	6,645	12.9	10.1
Burlington, CY	51,180	38,795	75.8	5,045	9.9	7,335	14.3	6.6
Halton Hills, T	16,835	12,935	76.8	1,645	9.8	2,255	13.4	6.6
Hamilton, C	144,120	100,635	69.8	16,270	11.3	27,220	18.9	2.4

Table 8 Canada, Ontario, CSD of Milton, T and neighbouring census subdivisions – Distribution of census families by family structure, 2011 Census

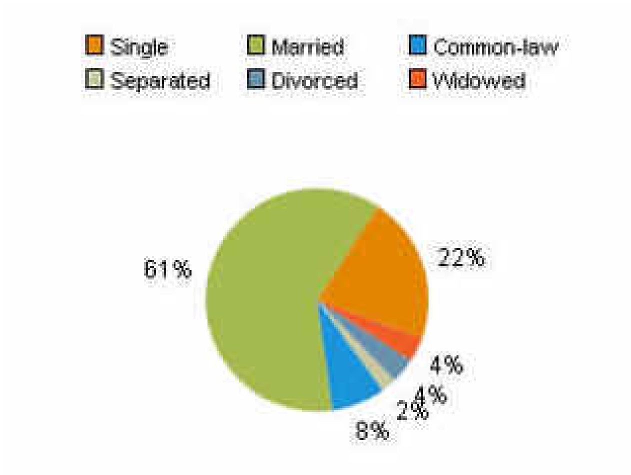
Milton – Presence of children within couple families

Among couples (married and common-law) in the census subdivision of Milton, 60.8% were couples with children aged 24 and under at home. In comparison, as a whole, 46.9% of couples in Canada had children aged 24 and under at home.

Married couples with children *	12,175
Married couples without children *	7,035
Common-law-couples with children *	980
Common-law-couples without children *	1,460

* Children aged 24 and under at home

Milton – Marital status



In Milton, 69.1% of the total population aged 15 and over were either married (61.4%) or living with a common-law partner (7.7%).

The remaining 30.9% were not married and not living with a common-law partner, including those who were single (never-married), separated, divorced or widowed.

Note: Percentages may not total 100 percent due to random rounding.

Marital status	Milton, T		Ontario		Canada	
	number	%	number	%	number	%
Total - Population 15 years and over	63,615	100.0	10,671,050	100.0	27,869,345	100.0
Married or living with a common-law partner	43,950	69.1	6,158,605	57.7	16,084,490	57.7
Married (and not separated)	39,075	61.4	5,367,400	50.3	12,941,965	46.4
Living common-law	4,880	7.7	791,210	7.4	3,142,525	11.3
Not married and not living with a common-law partner	19,660	30.9	4,512,440	42.3	11,784,855	42.3
Single (never legally married)	13,690	21.5	2,985,020	28.0	7,816,045	28.0
Separated	1,405	2.2	319,805	3.0	698,245	2.5
Divorced	2,315	3.6	593,730	5.6	1,686,035	6.0
Widowed	2,250	3.5	613,880	5.8	1,584,525	5.7

Table 9 Canada, Ontario, Milton, T – Population 15 years and older by marital status, 2011 Census

Milton – Types of private households

There were 27,560 private households[1] in Milton in 2011, a change of 49.4% from 2006. Of these, 45.1% of households were comprised of couples with children aged 24 and under at home, a change of 61.5% compared with five years earlier.

	Milton, T		Ontario		Canada	
Household type[5]	**number**	**%**	**number**	**%**	**number**	**%**
Total private households	27,560	100.0	4,887,505	100.0	13,320,615	100.0
Couple-family households with children aged 24 and under at home6	12,420	45.1	1,402,420	28.7	3,524,915	26.5
Couple-family households without children aged 24 and under at home7	7,575	27.5	1,408,120	28.8	3,935,540	29.5
Lone-parent family households8	2,235	8.1	535,825	11.0	1,375,450	10.3
One-person households	3,745	13.6	1,230,980	25.2	3,673,310	27.6
Multiple family households9	995	3.6	128,660	2.6	268,060	2.0
Other households10	590	2.1	181,500	3.7	543,340	4.1

Table 10 Canada, Ontario, Milton, T – Distribution of households by household type, 2011 Census

Milton – Structural type of dwelling

In Milton, 63.4% of private households lived in single-detached houses and 3.8% lived in apartments in buildings that have five or more storeys. The rest lived in other types of dwelling structures.

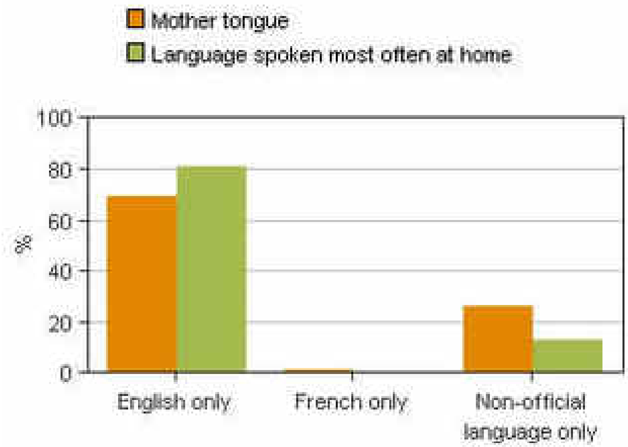
	Milton, T		Ontario		Canada	
Structural type of dwelling	**number**	**%**	**number**	**%**	**number**	**%**
Total - Structural type of dwelling	27,560	100.0	4,887,510	100.0	13,320,615	100.0
Single-detached house	17,485	63.4	2,718,880	55.6	7,329,150	55.0
Semi-detached house	2,870	10.4	279,470	5.7	646,240	4.9
Row house	5,130	18.6	415,230	8.5	791,600	5.9
Apartment, building that has five or more storeys	1,035	3.8	789,975	16.2	1,234,770	9.3
Apartment, building that has fewer than five storeys	755	2.7	498,160	10.2	2,397,555	18.0
Apartment, duplex	255	0.9	160,460	3.3	704,485	5.3
Other single-attached house11	20	0.1	9,535	0.2	33,310	0.3
Movable dwelling12	15	0.1	15,795	0.3	183,510	1.4

Table 11 Canada, Ontario, Milton, T – Distribution of private households by structural type of dwelling, 2011 Census

Language

In Milton, 69.5% of the population reported English only as mother tongue, 1.5% reported French only, and 26.0% reported a non-official language only, in 2011. In comparison, the provincial / territorial percentages were 68.2% for English only, 3.9% for French only and 25.7% for only non-official languages.

In 2011, 81.2% of the population spoke only English most often at home, 0.7% spoke only French and 12.6% spoke only a non-official language. In comparison, the provincial / territorial percentages were 79.0% for only English, 2.2% for only French and 14.4% for only a non-official language.



Note: Counts for mother tongue as well as those for language spoken most often at home include single responses only.

	Mother tongue		Language spoken most often at home	
Selected languages	**number**	**%**	**number**	**%**
Total	83,680	100.0	83,680	100.0
English	58,145	69.5	67,940	81.2
French	1,235	1.5	545	0.7
Non-official language	21,760	26.0	10,565	12.6
Multiple responses	2,545	3.0	4,630	5.5

Table 12 Milton, T – Mother tongue and language spoken most often at home, 2011 Census

	Mother-tongue retention13 (in percentage)		
Mother tongue	**Total retention; language spoken at home at least on a regular basis**	**Complete retention; language spoken most often at home**	**Partial retention; language spoken at home on a regular basis**
English	99.5	98.8	0.7
French	64.9	39.6	25.2
Non-official language	80.9	57.0	23.9
Note: Counts for mother tongue and home language include single response of a language as well as multiple responses of a language with English and/or French.			

Table 13 Milton, T – Mother-tongue retention, 2011 Census

Milton, T – Non-official languages

In Milton, the three most common mother tongues were Urdu (4.9%), Polish (2.3%) and Spanish (2.3%), in 2011. In comparison, the most common mother tongues at the provincial / territorial level were Italian (2.1%), Chinese, n.o.s. (1.6%) and Cantonese (1.5%).

Mother tongue	Number	Percentage of non-official language mother-tongue population	Percentage of total population
Urdu	4,135	17.2	4.9
Polish	1,910	7.9	2.3
Spanish	1,890	7.9	2.3
Tagalog (Pilipino, Filipino)	1,485	6.2	1.8
Panjabi (Punjabi)	1,455	6.0	1.7
Note: Counts for mother tongue and home language include single response of a language as well as multiple responses of a language with English and/or French.			

Table 14 Milton, T – The most common non-official-language mother tongues, 2011 Census

Milton, T – Bilingualism

	Mother tongue			
Age groups	Total	English	French	Non-official language
Total	7.1	6.1	87.0	5.5
0 to 19	7.2	6.0	72.0	8.7
20 to 44	8.2	7.5	91.9	5.3
45 to 64	6.0	4.4	91.0	4.2
65 and over	4.3	3.2	89.5	2.8
Note: Counts for mother tongue include single responses only. Consequently, the total excludes multiple responses.				

Table 15 Milton, T – Rate of English-French bilingualism by mother tongue and age groups, 2011 Census

Knowledge of official languages	Number	Percentage
Total	83,680	100.0
English only	76,325	91.2
French only	100	0.1
English and French	6,190	7.4
Neither English nor French	1,075	1.3

Table 16 Milton, T – Knowledge of official languages, 2011 Census

Symbols:

...	not applicable
†	excludes census data for one or more incompletely enumerated Indian reserves or Indian settlements. For further information, refer to Notes.
¶	incompletely enumerated Indian reserve or Indian settlement. For further information, refer to Notes.
A	adjusted figure due to boundary change. For further information, refer to Content considerations.
E	use with caution. For further information, refer to Cautionary note.

Note(s):

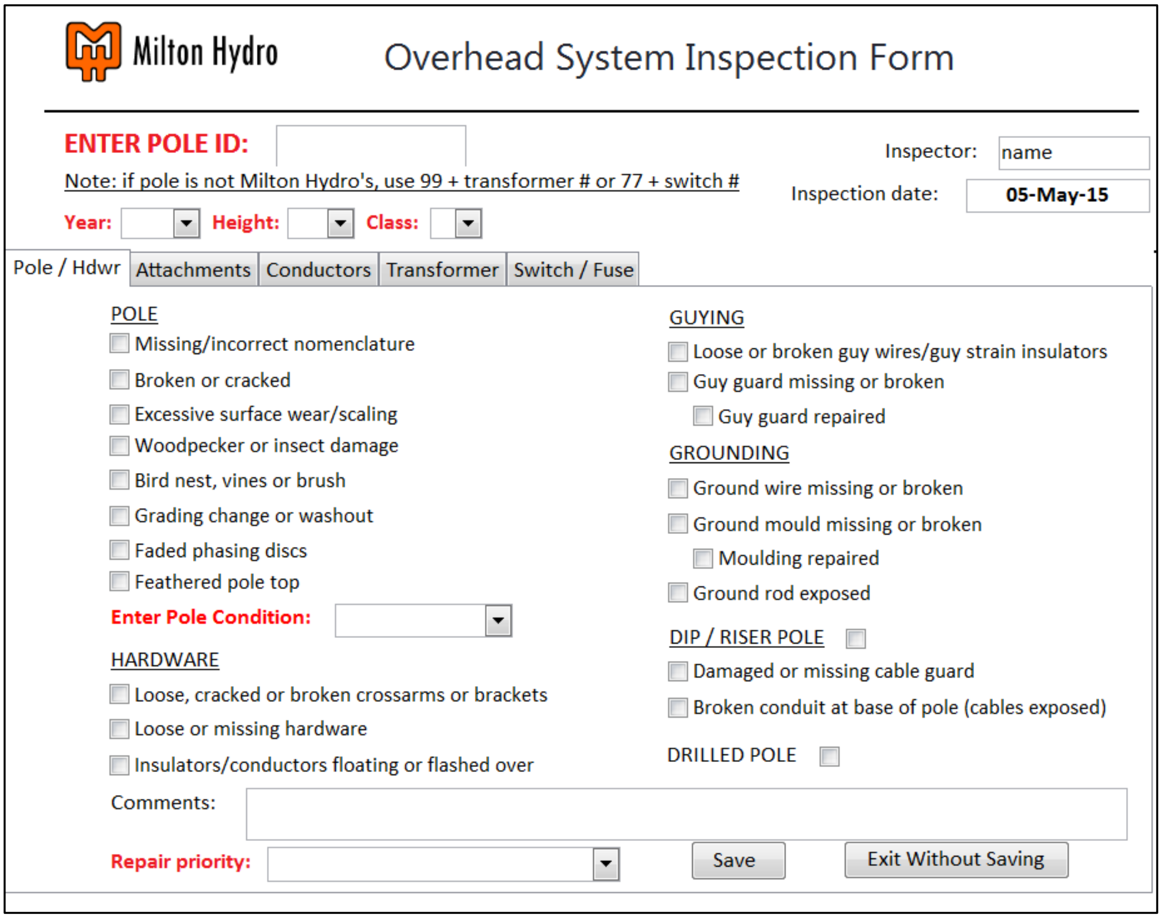
1. Milton, T (Ontario) – This census subdivision has the following data quality indicators (commonly referred to as data quality flags):

   2006 adjusted count: most of these are the result of boundary changes.
2. Median age: Age 'x' that divides a population in two groups of the same population size, one group being older than age 'x' and the other group being younger than age 'x'.
3. Census family: Refers to a married couple (with or without children), a common-law couple (with or without children) or a lone parent family.
4. Household, private: Refers to a person or a group of persons (other than foreign residents) who occupy a private dwelling and do not have a usual place of residence elsewhere in Canada.
5. Household type: Refers to the basic division of private households into family and non-family households. Family household refers to a household that contains at least one census family, that is, a married couple with or without children, or a couple living in common-law with or without children or a lone parent living with one or more children.
6. Couple-family households with children: Refers to couple households with at least one child aged 24 and under.
7. Couple-family households without children: Refers to couple households without children aged 24 and under. Includes couple households with all children aged 25 and over.
8. Lone-parent-family households: Refers to all lone-parent family households regardless of age of children.
9. Multiple-family households: Refers to a household in which two or more census families (with or without additional persons) occupy the same private dwelling.
10. Other households: Refers to two or more people who share a private dwelling, but who do not constitute a census family.
11. Other single-attached house: A single dwelling that is attached to another building and that does not fall into any of the other categories, such as a single dwelling attached to a non-residential structure (e.g., a store or a church) or occasionally to another residential structure (e.g., an apartment building).
12. Movable dwelling includes mobile homes and other movable dwellings such as houseboats and railroad cars.
13. Mother-tongue retention: Retention refers to the situation where people speak their mother tongue at home. Retention is defined as 'complete' when the mother tongue is the language spoken most often and 'partial' when it is spoken on a regular basis but not most often. The (complete or partial) retention rate refers to the proportion of the population with a given mother tongue that speaks that language at home most often or on a regular basis. The retention rate provides an indication of a group's linguistic vitality, particularly the importance of transmitting languages between generations.

Source:

Statistics Canada. 2012. *Focus on Geography Series, 2011 Census*. Statistics Canada Catalogue no. 98-310-XWE2011004. Ottawa, Ontario. Analytical products, 2011 Census. Last updated October 24, 2012.

Appendix B – Overhead Distribution Inspection



Milton Hydro

Overhead System Inspection Form

ENTER POLE ID:

Note: if pole is not Milton Hydro's, use 99 + transformer # or 77 + switch #

Year: Height: Class:

Inspector: name

Inspection date: 05-May-15

Pole / Hdwr | Attachments | Conductors | Transformer | Switch / Fuse

POLE
- Missing/incorrect nomenclature
- Broken or cracked
- Excessive surface wear/scaling
- Woodpecker or insect damage
- Bird nest, vines or brush
- Grading change or washout
- Faded phasing discs
- Feathered pole top

Enter Pole Condition:

HARDWARE
- Loose, cracked or broken crossarms or brackets
- Loose or missing hardware
- Insulators/conductors floating or flashed over

GUYING
- Loose or broken guy wires/guy strain insulators
- Guy guard missing or broken
  - Guy guard repaired

GROUNDING
- Ground wire missing or broken
- Ground mould missing or broken
  - Moulding repaired
- Ground rod exposed

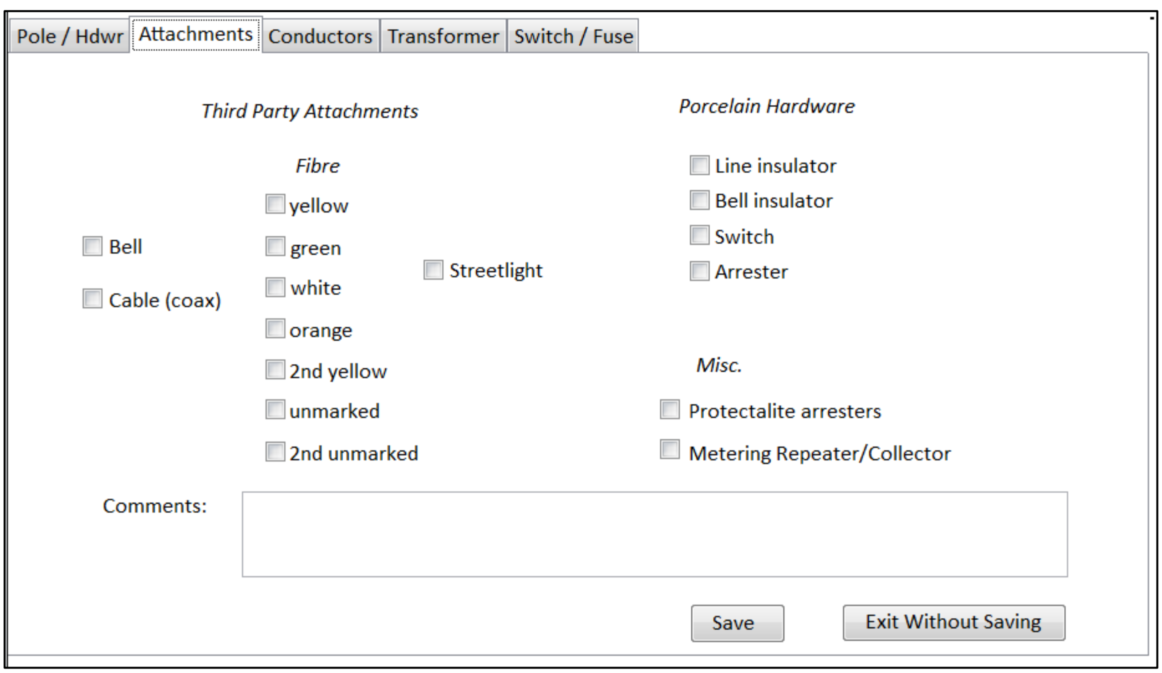
DIP / RISER POLE
- Damaged or missing cable guard
- Broken conduit at base of pole (cables exposed)

DRILLED POLE

Comments:

Repair priority:

Save | Exit Without Saving



Pole / Hdwr | Attachments | Conductors | Transformer | Switch / Fuse

Third Party Attachments

Fibre
- yellow
- green
- white
- orange
- 2nd yellow
- unmarked
- 2nd unmarked

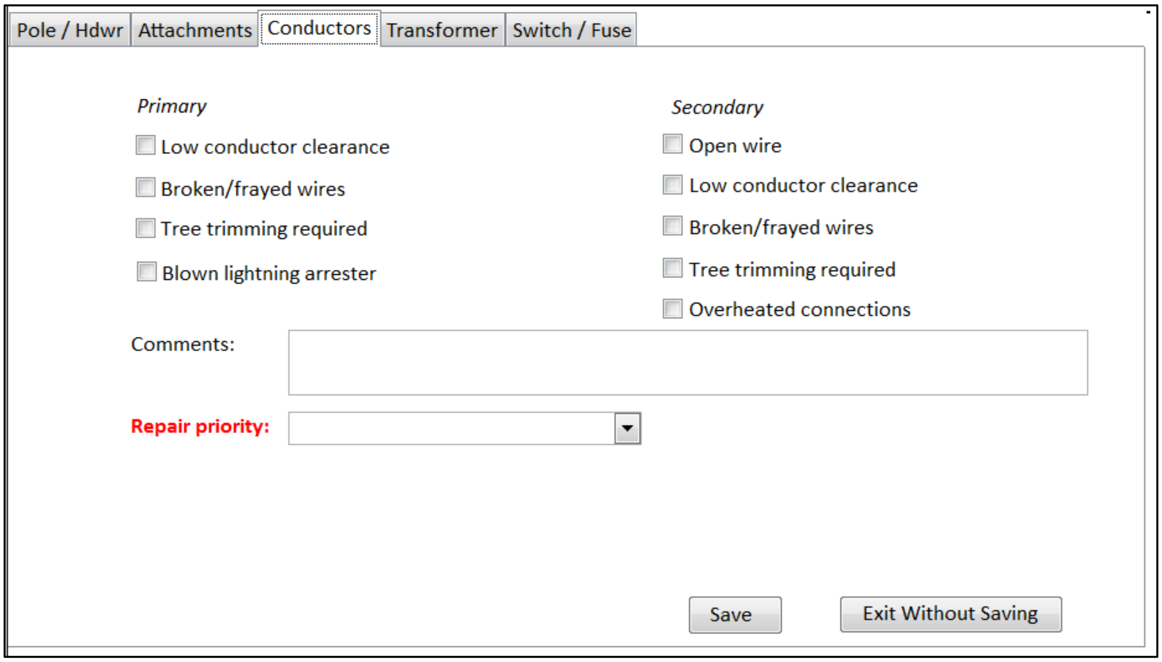
- Bell
- Cable (coax)
- Streetlight

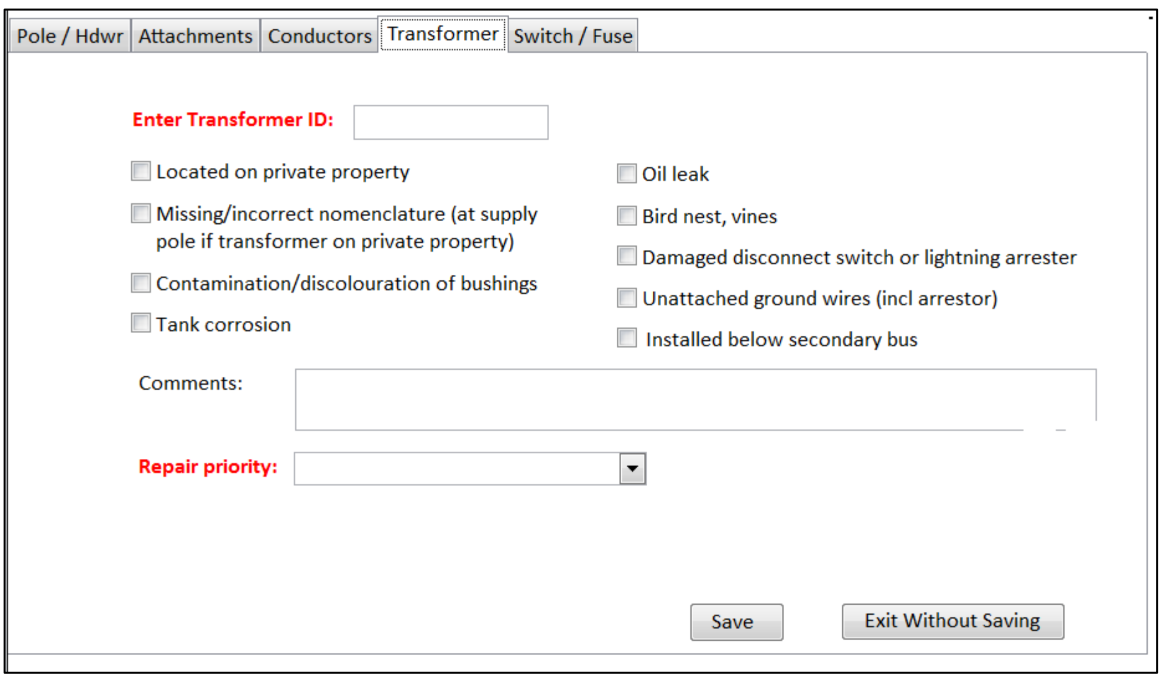
Porcelain Hardware
- Line insulator
- Bell insulator
- Switch
- Arrester

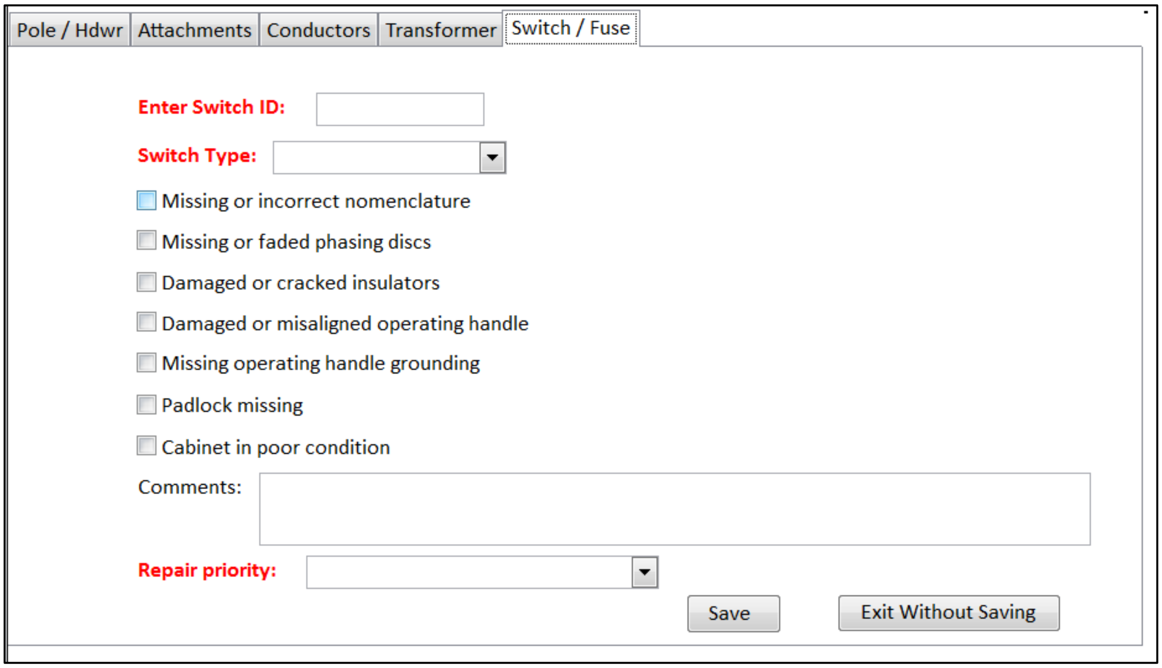
Misc.
- Protectalite arresters
- Metering Repeater/Collector

Comments:

Save | Exit Without Saving


Pole / Hdwr
Attachments
Conductors
Transformer
Switch / Fuse
Primary
Low conductor clearance
Broken/frayed wires
Tree trimming required
Blown lightning arrester
Secondary
Open wire
Low conductor clearance
Broken/frayed wires
Tree trimming required
Overheated connections
Comments:
Repair priority:
Save
Exit Without Saving


Pole / Hdwr
Attachments
Conductors
Transformer
Switch / Fuse
Enter Transformer ID:
Located on private property
Missing/incorrect nomenclature (at supply pole if transformer on private property)
Contamination/discolouration of bushings
Tank corrosion
Oil leak
Bird nest, vines
Damaged disconnect switch or lightning arrester
Unattached ground wires (incl arrestor)
Installed below secondary bus
Comments:
Repair priority:
Save
Exit Without Saving


Pole / Hdwr | Attachments | Conductors | Transformer | Switch / Fuse

Enter Switch ID:

Switch Type:

- [ ] Missing or incorrect nomenclature
- [ ] Missing or faded phasing discs
- [ ] Damaged or cracked insulators
- [ ] Damaged or misaligned operating handle
- [ ] Missing operating handle grounding
- [ ] Padlock missing
- [ ] Cabinet in poor condition

Comments:

Repair priority:

Save | Exit Without Saving

Appendix C – Transformer Maintenance Inspection

Milton Hydro Padmount Inspection Form

Transformer Loc #:

Paint Condition:

- ☐ Manufacturer Paint Defect
- ☐ Other Cause (eg. construction)
- ☐ Water collecting on top of tank
- ☐ Repainted - improper preparation

Comments:

Access / Grading Issues:

- ☐ Transformer Shifted off pad
- ☐ Misaligned Concrete Cover
- ☐ Holes in Concrete Cover to be Plugged
- ☐ Grading Changes / Sink Hole
- ☐ Exposed Re-bar / Broken Cover or Foundation
- ☐ Lock / Penta bolt missing or damaged
- ☐ Shrubs
- ☐ **Oil Leak**
  - ☐ Top
  - ☐ Base
- ☐ Concrete Splatter on Tank
- ☐ Missing / Incorrect Nomenclature
- ☐ Other (see comments)

Comments:

Priority:

Milton Hydro

Transformer Maintenance Inspection Checklist

Address (Location):

Location #

Type:	Submersible		Voltage:	16 kV
	Vault			8 kV
	Pad Mount			4.8 kV
	Pole Mount			2.4 kV

Transformer Maintenance Checklist:

Yes	No	N/A	
			Danger High Voltage Sign in place
			Transformer Location Number in place
			High Voltage Cables identified & legible
			Open Point (correctly identified on drawing)
			Secondary Cables identified & legible
			Exterior of Transformer in good condition (please comment below, if necessary)
			Evidence of Oil Leak in Vault
			Drain functioning
			Water test required for contaminants
			Hinges in good condition (oil, if necessary)
			Grounding cable/connections secure/good condition
			Primary Neutral connections secure/good condition
			Primary Insulators in good condition
			Secondary Insulators in good condition
			Concrete Pad Base and Top in good condition
			Transformer square on base
			Submersible collar aligned with base
			Submersible Vault drain working
			Galvanize Submersible top and Grate ends in good condition
			Vault Room Lighting (in working condition)
			Padlock in place
			1/2" nuts installed and secure (submersible vaults)
			Door Hasp, Padlock secure (vault rooms)
			Fault Indicators in place
			Arrestor protection in operating condition
			New Hazard Identified

Comments:

Completed by: Date:

Follow-up by Date:

Appendix D – Switch Cubicle Maintenance

Milton Hydro

Switching Cubicle Maintenance Checklist

Address/Location: ______________________

____

Switching Cubicle #: [ ]

Type:	______	Voltage:	[ ] 27.6 kV
Date of Mfg.:	______		[ ] 13.8 kV
Serial #:	______	Fuse Size:	[ ]
Model #:	______		[ ]

Switching Cubicle Maintenance Checklist:

Yes	No	N/A	
			Nomenclature in place
			Phasing targets installed
			Cables properly labelled
			Contacts visually checked
			Switch Alignment checked
			Insulators in good condition (cleaning required)?
			Line/Load connections in good condition
			Grounding & Neutral cable/connections in good condition
			Operating handle/joints/rods/brackets in good repair
			Line and load conductors at open point have been phase checked
			Exterior of switching cubicle in good conditions (paint-comment below if required)
			Hinges in good condition (oil if necessary)
			Unit aligned with base
			Replace flush mount bolts/nuts on access doors if required
			Concrete base in good condition
			Hex bolt padlock secure on unit
			Open hatch and check for water in base
			New Hazard Identified (comment below)

Comments: ______________________

____

____

____

Completed by: ______________ Date: ______

Follow-up by ______________ Date: ______

Appendix E – Substation Maintenance

Milton Hydro

Substation Maintenance Checklist

Substation #

- [ ] **1 (MRS) (MS#7) 5 Side Road (Regulator)**
- [ ] **7 (5 Sideroad West of Appleby Line)**
- [ ] **3 (Wilson Dr. North of Main St. - East Side)**
- [ ] **4 (Derry Rd. - West of Bronte St.)**
- [ ] **5 (MRS) Bronte St (Regulator)**
- [ ] **6 (Sixth Line South of 25 Sideroad)**
- [ ] **9 (Second Line North of 15 Sideroad)**

Inspection Checklist:

Yes	No	N/A	
			Fencing secure
			Inspect all locks and lubricate if required
			Align gates to open/close properly
			High Voltage Signs approximately every 6 m on all sides of fenced compound
			Grounding to fence/gates is in place & gates bonded
			Remove branches/shrubs growing through or near fence
			Weedeat inside compound and around perimeter of fence
			Remove garbage from compound
			Visual/audible check for broken insulators
			Check equipment for oil leaks
			Bunker doors clear of obstical (snow) & functional for emergency exit
			Debrise & or snow removed from operating switch platforms
			Check switch handles - clear of wasp nests
			New Hazard Identified
			Fire Extinguisher Charged

Comments: ______________________________

Inspected by: ______________________ Date: ______________

Follow-up by: ______________________ Date: ______________

Appendix F – Infrared Thermography

Milton Hydro

8069 Lawson Road
Milton, Ontario.
L9T 5C4

Scan Locations:
City of Milton & Region

Electrical Infrared Thermographic Inspection

IR Reference # **141268**
Inspection Dates: **September 8 - 12, 2014**

The intent of this thermographic inspection was to survey the selected electrical equipment, locating potential problems and determine their seriousness.

At **Infrared Thermographic Analysis Inc**. we use various Industrial grade Infrared scanning systems including the *Flir ThermoCAM P620* and the *Flir ThermoCAM P60*. These industrial grade imagers are used to detect defects in various electrical distribution systems.

These cameras can convert infrared (or heat) radiation into a visible image. During the survey, digital Infrared images and normal photographs were taken to depict the extent and location of the defects. Since infrared energy is a direct and proportional function of temperature, the image is designed to depict temperature levels on the monitor. Utilizing a special feature (isotherms) on the Flir® thermal system, temperature differentials can be established.

Temperature differences as minute as *0.02°C* can be detected, measured and recorded. Various shades of grey or hues of colour represent different temperature levels. Black corresponds to a colder temperature and white indicates a hotter temperature in grey-tone. Yellow/light pink represents hotter temperatures while blue/purple cooler temperatures in Colour mode.

The actual amount of heat emitted from a failing electrical component depends on both the ambient conditions and the actual current flow through that point. High voltage electrical currents will stress most components and are easily detected, while some incipient failures will not occur unless the apparatus is subject to very high loads.

Where a defect has been discovered, our inspector has taken a thermal image of that fault and has included it in the report which follows.

Beside each thermogram is the corresponding data pertinent to that defect. In the case of electrical inspections, the temperature rise of the hot phase to ambient air temperature is usually presented. Below the thermogram is a normal colour photograph showing the referenced location of the suspected defect.

Each problem should be inspected for physical damage in order to determine whether repair or replacement of that particular component is required.

Repair Priority Recommendations

The classification of faults is presented in the following way:

ΔT: ≤ 5°C	*The beginning of a fault.* The object should be inspected again and repaired, if necessary, at the next planned maintenance stop.
ΔT: 5° to 30°	*Typical overheating.* The object should be kept under observation and repaired as soon as possible.
ΔT: > 30°C	***Dangerous overheating.*** The object should be repaired immediately.

To estimate temperature rise at maximum load, Ohm's law is used.

$$\mathbf{P = U * I = R * I^2}$$

P = Power (Watts), R = Resistance (Ohms)
I = Current (Amps) U = Voltage (Volts)

Although the temperature rise is not quite linear with the power developed at the fault, this method gives an acceptable estimate of the temperature rise when the load (current) is different.

Example…

A temperature rise by 8°C at 20% load gives a rise of about 50°C at 50% load:

(50/20) * (50/20) = 6,25; ⇒ 8° * 6,25 = 50°C

Item #1

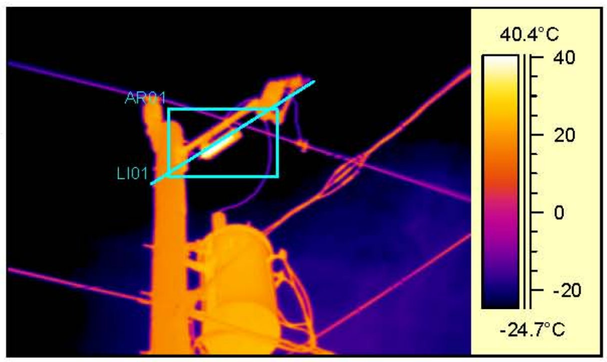
Location

Pole Location **#P8504**
Switch **#S3723**
Near #5556 4th Line.
MILTON.

Description

Lightning arrestor
above transformer.

Object parameter	Value
Emissivity	0.94
Object distance	14.0 m
Ambient temperature	18.0°C



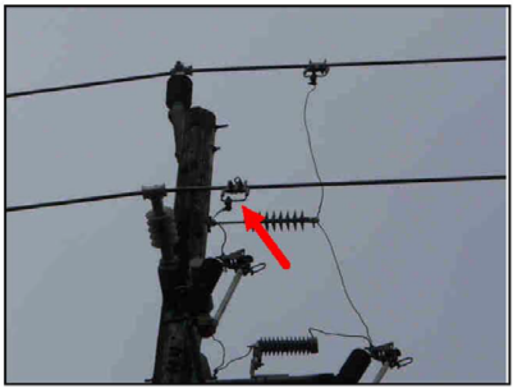
Observation at 8/25/2014 9:16:59 AM

Fault AR01... 44.8°C **Ok AR02...** - T.Rise... 26.8°C **PRIORITY:**

Notes & Recommendations

Repeated ________________ by ____________________________

Item #3



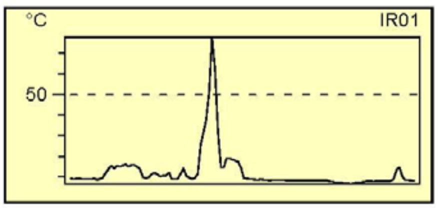
Location

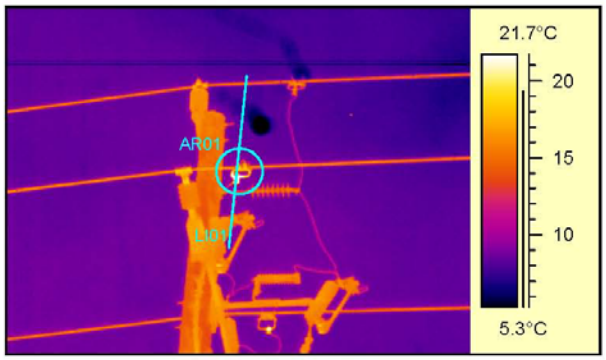
Pole Location # **P4877**
Switch **# S1953**
Main Street East at *Bishop Reding Roman Catholic Secondary School.*
MILTON.

Description

Hotline clamp assembly
above switch on Field phase.

Object parameter	Value
Emissivity	0.95
Object distance	15.0 m
Ambient temperature	14.0°C





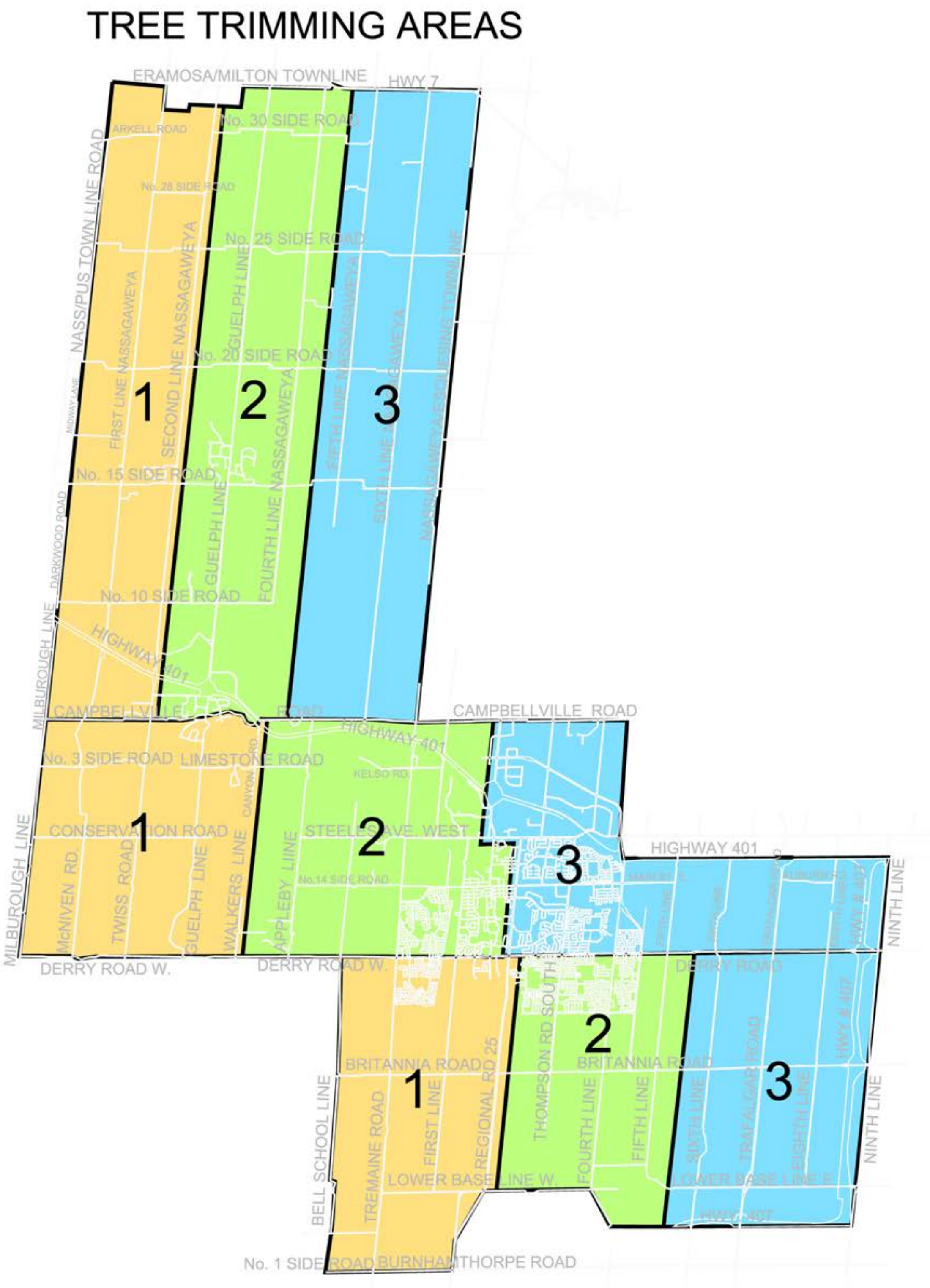
Observation at 9/11/2014 10:58:01 AM

Fault AR01... 77.8°C Ok AR02... - T.Rise... 63.8°C PRIORITY:

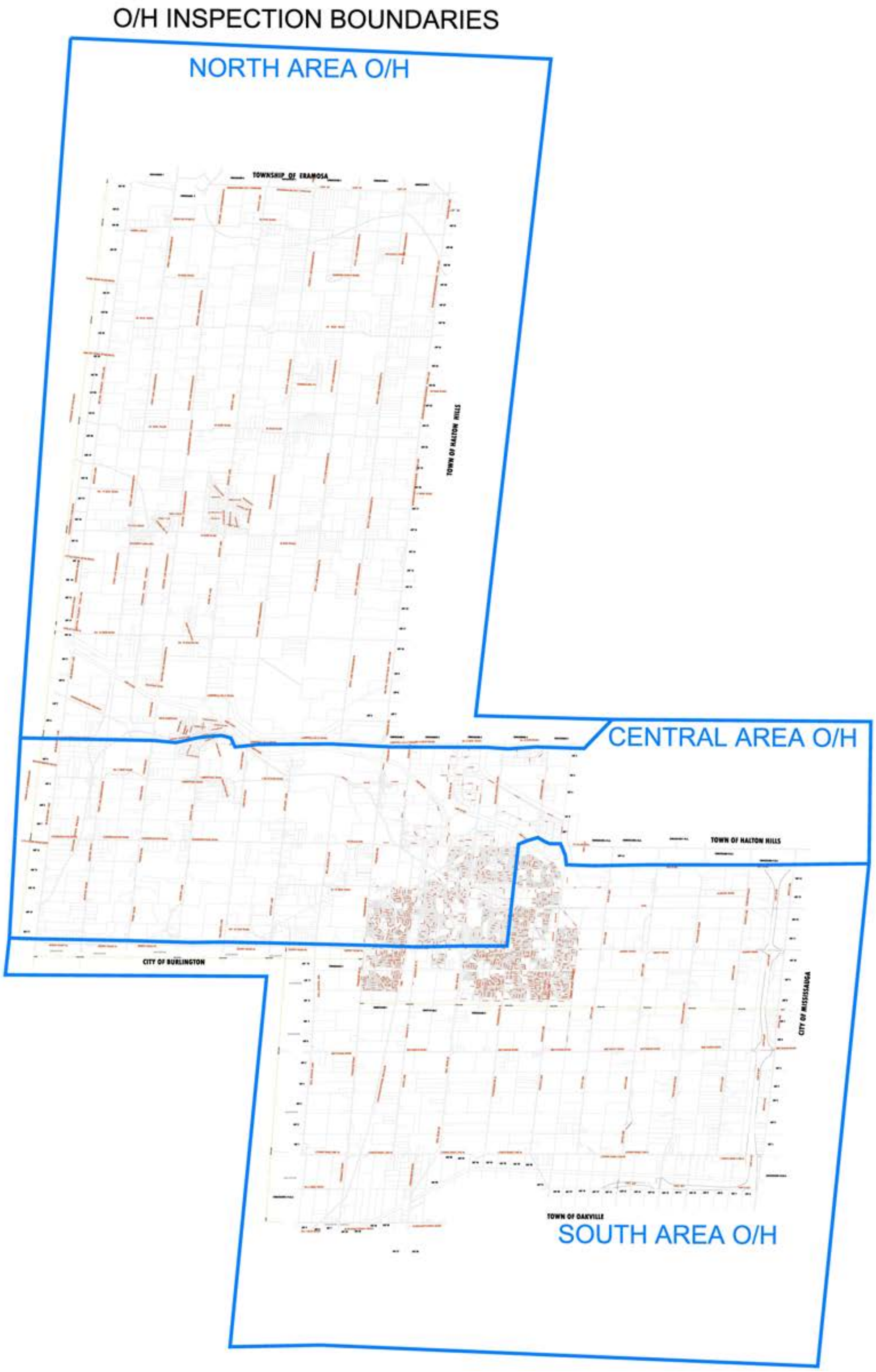
Notes & Recommendations

Repaired ________________ by ____________________________

Appendix G – Tree Trimming Areas



Appendix H – Pole Inspection Areas



Appendix I – Pole Test - Inspection Results

	B	AW	AX	BK	EW	EX
1	POLE_NUMBE	Pole Comments	Pole repair priority	Transformer ID	Pole Repairs	Follow up
293	5237		No followup required			no follow-up required
294	5238		No followup required			no follow-up required
295	5239		No followup required			no follow-up required
296	5240		No followup required			no follow-up required
297	5241		No followup required			no follow-up required
298	5242		No followup required			no follow-up required
299	5243		No followup required			no follow-up required
300	5244		No followup required			no follow-up required
301	5245		No followup required			no follow-up required
302	5251		Schedule for repair			no follow-up required
303	5252		No followup required			no follow-up required
304	5253		No followup required			no follow-up required
305	5254		No followup required			no follow-up required
306	5255	hollow pole - replace	Schedule for repair		hollow pole - replace	replace pole - 2014
307	5256		No followup required			no follow-up required
308	5265		No followup required			no follow-up required
309	5306		No followup required			no follow-up required
310	5307		No followup required		Ground mould missing or broken; ; Porcelain Equipment: Switch	porcelain work only, ground mould repaired by Inspector
311	5308		No followup required			no follow-up required
312	5309		No followup required			no follow-up required
313	5310		No followup required		; Porcelain Equipment: Switch	porcelain work only
314	5311		No followup required			no follow-up required
315	5312		No followup required			no follow-up required
316	5313		No followup required			no follow-up required
317	5314		No followup required		Ground mould missing or broken;	no follow-up required, ground mould repaired by Inspector
318	5315		No followup required	501		no follow-up required
319	5316		Schedule for repair		Damaged or missing cable guardGround mould missing or broken; ; Porcelain Equipment: Switch	repairs & porcelain - gave list to Operations, April 30 2015
320	5317		No followup required			no follow-up required
321	5318		No followup required		Ground mould missing or broken;	no follow-up required, ground mould repaired by Inspector
322	5319		No followup required			no follow-up required
323	5320		No followup required			no follow-up required
324	5321		No followup required	2893		no follow-up required
325	5322		No followup required		; Porcelain Equipment: Switch	porcelain work only
326	5323		No followup required			no follow-up required
327	5324	HOLLOW IN MIDDLE	Urgent - repair within 2 weeks		previously sent for follow-up	previously sent for follow-up
328	5325		No followup required		; Porcelain Equipment: Switch	porcelain work only
329	5326		No followup required			no follow-up required
330	6772		No followup required			no follow-up required
331	6773		No followup required			no follow-up required
332	6774		No followup required			no follow-up required
333	6775		No followup required			no follow-up required
334	6776		No followup required			no follow-up required
335	6777		No followup required			no follow-up required
336	6778		No followup required			no follow-up required
337	6779		No followup required			no follow-up required

Appendix J – Instruction Order

MILTON HYDRO
DISTRIBUTION INC.

No:

INSTRUCTION ORDER

STAYING ALERT IS STAYING ALIVE

Issued To:	Issued By:	Date:	Charge Labour & Material:

Remarks/Follow Up/Changes:	CUSTOMER DATA	
	Name & Address:	
	Account No:	Phone No:

Completed By:	Date:	Map No:	Transformer No.	Meter No.

201-10-FOR V2

Appendix K – Switch Maintenance

Milton Hydro

Switch Maintenance Checklist

Address/Location: ______________________________

____

Switch # [ ]

Type: Loadbreak [ ] Airbreak [ ] In-Line (solid) [ ] In-Line (fused) [ ]

Voltage: [ ] 44 kV [ ] 27.6 kV [ ] 13.8 kV [ ] 8.32 kV [ ] 4.16 kV

Switch Maintenance Checklist:

Yes	No	N/A	
			Nomenclature in place
			Contacts visually checked and cleaned
			Switch Alignment checked
			Insulators in good condition (switch, deadends)
			Line/Load connections in good condition (wedgetaps, squeezons)
			Line/Load connections clean and tight (pig tails)
			Grounding cable/connections in good condition (switch, neutral, handle, strap)
			Operating handle/joints/rods/brackets in good repair
			Cross/Vertical arms in good condition and secure to pole
			Ground Mat
			Switch has been operated sucessfully (open, close)
			Switch pole in good condition
			Phasing targets installed
			Line and load conductors at open point have been phase checked
			New Hazard Identified

Comments: ______________________________

____

____

____

Completed by: ____________________ Date: ____________

Follow-up by ____________________ Date: ____________

303-4-FOR-Switch V2

Appendix L – Capital Project Template

Milton Hydro

2016 Capital Project Summary

A. General Information on the Project

Project Information

Project Name	
Investment Category	
Project Description	

Capital Investment (5.4.5.2.A 1st bullet)

Gross Capital	
Customer Contribution	
Net Capital	
O&M Costs	

Customer Attachments/Load (5.4.5.2.A 2nd bullet)

Customer Attachments (#)	
Customer Load (peak kVA)	

Project Timing (5.4.5.2.A 3rd bullet)

Start Date	
Expected In-Service Date	
Expenditure Timing:	
Q1	
Q2	
Q3	
Q4	

Risk and Risk Mitigation (5.4.5.2.A 4th bullet)

Comparative Information (5.4.5.2.A 5th bullet)

Historical Comparative Costs	
2011	
2012	
2013	
2014	
2015	

Total Capital & OM&A Costs Associated with REG Investments (5.4.5.2.A 6th bullet)

Leave to Construct Approval (5.4.5.2.A 7th bullet)

B. Evaluation Criteria and Information Requirements

Efficiency, Customer Value, Reliability (5.4.5.2.B.1)

Main Driver of Project **(5.4.5.2.B.1a)**	
Related Objectives and/or Performance Targets	
Source and Nature of Information used to Justify Project	
Secondary Driver (where applicable)	
Related Objectives and Performance Targets	
Source and Nature of Information used to Justify Project	
Investment Priority	
Analysis of Project and Project Alternatives **(5.4.5.2.B.1.c)**	

Effect of Investment on System Operation Efficiency and Cost Effectiveness	
Net benefits accruing to customers	
Impact of Investment on Reliability Performance	

Safety (5.4.5.2.B.2)

Information on the effect of the investment on health and safety protections and performance	

Cyber-security, Privacy (5.4.5.2.B.3)

Information showing that the investment conforms to all applicable laws, standards and best utility practices pertaining to customer privacy, cyber-security and grid protection	

Co-ordination, Interoperability (5.4.5.2.B.4)

Information on how the investment applies recognized standards, referencing co-ordination with utilities, regional planning, and/or links with 3rd party providers and/or industry **(5.4.5.2.B.4.a)**	
Information on how the investment potentially enables future technological functionality and/or addresses future operational requirements **(5.4.5.2.B.4.b)**	

Economic Development (5.4.5.2.B.5)

Effect of investment on Ontario economic growth and job creation	

Environmental Benefits (5.4.5.2.B.6)

Effect of investment on the use of clean technology, conservation and more efficient use of existing technologies	

C. Category-Specific Requirements

System Access

Justification of Project (5.4.5.2.C.a)

Factors Affecting the Timing/ Priority of Implementing the Project **(5.4.5.2.C.a – 1st bullet)**	
Factors Relating to Customer Preferences or Input from Customers and other Third Parties **(5.4.5.2.C.a – 2nd bullet)**	
Factors Affecting the Final Costs of the Project (5.4.5.2.C.a – 3rd bullet)	
How Controllable Costs have been Minimized (5.4.5.2.C.a – 4th bullet)	
Other Planning Objectives met by the Project (5.4.5.2.C.a – 5th bullet)	
Technically feasible project options **(5.4.5.2.C.a – 6th bullet)**	
Summary of options analysis **(5.4.5.2.C.a – 7th bullet)**	
Results of the 'Final Economic Evaluation' carried out as per section 3.2 of the DSC **(5.4.5.2.C.a – 8th bullet)**	
REG Investment - Nature and Magnitude of System Impacts, Costs and Cost Recovery **(5.4.5.2.C.a. 9th bullet)**	