Waterloo North Hydro

EXHIBIT 2

CAPITAL

TABLE OF CONTENTS

LIST OF ATTACHMENTS

EXHIBIT 2: CAPITAL

2.2 EXHIBIT 2: RATE BASE

2.2.1 RATE BASE

2.2.1.1 OVERVIEW

The Rate Base used for the purpose of calculating the revenue requirement in this Application follows *Chapter 2 of the Filing Requirements for Electricity Distribution Applications* issued by the Ontario Energy Board ("Board") on May 14, 2020 (the "Filing Requirements"). In accordance with the Filing Requirements, Waterloo North Hydro Inc. (WNH) has calculated the Rate Base as the average of the Net Capital Balances at the beginning and the end of the 2021 Test Year plus a Working Capital Allowance, which is 7.5% of the sum of the Cost of Power and Controllable Expenses. The use of a 7.5% rate is consistent with the Board's letter of June 3, 2015 and the Filing Requirements as issued by the OEB. WNH has not completed a lead-lag study or equivalent analysis to support a different rate and has submitted this Application using the default value of 7.5%.

WNH was also not previously directed by the OEB to undertake a lead/lag study.

Net Capital Assets include in-service assets that are associated with activities that enable the conveyance of electricity for distribution purposes minus Accumulated Depreciation and Contributed Capital from third parties. For purposes of this Exhibit, Distribution Assets refer to those assets that are most directly related to the distribution system, such as poles, overhead and underground lines, and transformers. General Plant refers to assets that support the operation of the distribution system such as computer hardware and software, vehicles, buildings, equipment. Capital Assets include Property, Plant and Equipment ("PP&E") and Intangible Assets; these are referred to as "Capital" or "Fixed

Assets" throughout this evidence. The Rate Base calculation excludes any Non-Distribution Assets. WNH has not applied for, nor received, any Incremental Capital Module ("ICM") or Advanced Capital Module ("ACM") adjustments.

WNH does not have any in-service balances previously recorded in DVAs.

WNH has provided its Rate Base calculations for the years 2016 Board Approved, 2016 – 2019 Actual, 2020 Bridge Year and 2021 Test Year in Table 2-1 below:

Table 2-1 - Summary of Rate Base

Description	2016 Board Approved	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
Reporting Basis	**MIFRS**	**MIFRS**	**MIFRS**	**MIFRS**	**MIFRS**	**MIFRS**	**MIFRS**
Gross Fixed Assets Opening Balance	332,881,281	331,035,728	348,262,734	362,590,468	377,491,930	394,222,378	413,367,112
Gross Fixed Assets Closing Balance	348,948,838	348,262,734	362,590,468	377,491,930	394,222,378	413,367,112	430,000,639
Average Gross Fixed Assets	**340,915,060**	**339,649,230**	**355,426,599**	**370,041,199**	**385,857,154**	**403,794,745**	**421,683,876**
Accumulated Depreciation Opening Balance	142,300,708	142,282,955	150,506,090	159,098,931	167,512,048	176,974,560	187,638,253
Accumulated Depreciation Closing Balance	150,804,014	150,506,090	159,098,931	167,512,048	176,974,560	187,638,253	198,617,718
Average Accumulated Depreciation	**146,552,361**	**146,394,520**	**154,802,509**	**163,305,490**	**172,243,304**	**182,306,408**	**193,127,987**
Average Net Book Value	**194,362,699**	**193,254,710**	**200,624,090**	**206,735,709**	**213,613,850**	**221,488,338**	**228,555,889**
Working Capital	190,606,909	198,940,526	182,506,585	182,307,765	187,819,564	226,106,047	215,060,066
Working Capital Allowance (%)	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Working Capital Allowance	**14,295,518**	**14,920,539**	**13,687,994**	**13,673,082**	**14,086,467**	**16,957,953**	**16,129,505**
Rate Base	**208,658,217**	**208,175,249**	**214,312,084**	**220,408,791**	**227,700,317**	**238,446,291**	**244,685,394**

WNH calculated its 2021 Rate Base as $244.69M, an increase of $36.03M over the 2016 Board Approved Rate Base of $208.66M. This increase in Rate Base of $36.03M is attributable to an increase in the Average Net Book Value of Capital Assets of $34.19M and an increase in the Working Capital Allowance of $1.83M. WNH reinvested significantly in its distribution system since the last Cost of Service (COS) Application, including some significant one-time investments discussed below and this is reflected in the Net Book Value variance; 95% of the incremental increase to Rate Base is driven by investment in the system through an increase in Net Book Value. Approximately 92% of the Working Capital increase of $24.46M is related to Cost of Power.

WNH's overall capital investment plan has been historically driven by System Renewal investments followed by System Access and does not fluctuate considerably year to year. In 2016, WNH had a significant increase in capital expenditure for the Region of Waterloo's Light Rail Transit (LRT) project however a substantial portion of this was offset by a capital contribution and therefore the net additions were not greatly impacted.

WNH has provided a summary of its calculations of the Cost of Power and Controllable Costs used in the calculations for determining Working Capital for the years 2016 Board Approved, 2016 – 2019 Actual, 2020 Bridge Year and 2021 Test Year in Table 2-2 below. Further details of WNH's Cost of Power calculations are provided in Table 2-28. The 2020 Bridge Year is forecast data.

Table 2-2 Summary of Working Capital Calculation

Description	2016 Board Approved	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
Distribution Expenses - Operation	5,689,381	5,818,874	5,949,887	6,021,921	6,269,001	6,039,717	6,310,421
Distribution Expenses - Maintenance	1,613,140	1,543,946	1,608,420	1,963,196	1,497,703	1,867,332	1,903,411
Billing and Collecting	2,802,731	2,728,245	2,823,342	3,100,765	2,966,160	3,008,184	3,137,007
Community Relations	142,200	104,616	129,492	200,330	244,189	347,738	508,564
Administrative and General Expenses	2,869,882	2,584,121	3,054,727	3,223,637	3,482,548	3,778,758	3,869,654
Donations - LEAP	42,000	42,000	42,000	42,000	42,000	42,000	48,000
Taxes Other than Income Taxes	489,734	471,270	448,350	444,419	458,134	462,373	471,620
Less Allocated Depreciation	(173,427)	(786,675)	(780,501)	(766,351)	(735,577)	(707,129)	(724,487)
Power Supply Expenses	177,131,268	186,434,129	169,230,868	168,077,848	173,595,406	211,267,074	199,535,876
Total Working Capital Expenses	**190,606,909**	**198,940,526**	**182,506,585**	**182,307,765**	**187,819,564**	**226,106,047**	**215,060,066**

Variance Analysis of Rate Base

The following section sets out WNH's Rate Base and Working Capital calculations and explanations for the following variances:

- 2016 Actual against 2016 Board Approved
- 2017 Actual against 2016 Actual
- 2018 Actual against 2017 Actual
- 2019 Actual against 2018 Actual

- 2020 Bridge Year against 2019 Actual and
- 2021 Test Year against 2020 Bridge Year

WNH has calculated the materiality threshold on its Rate Base to be $196,490 for 2021 in accordance with the Filing Requirements. On this basis, WNH has selected a materiality threshold of $190,000. This calculation is summarized in Exhibit 1 Table 1-6.

Table 2-3 2016 Board Approved vs 2016 Actual

Description	2016 Board Approved	2016 Actual	Variance from 2016 Board Approved	%
Net Capital Assets in Service				
Opening Balance	190,580,573	188,752,775	(1,827,798)	-1.0%
Ending Balance	198,144,824	197,756,644	(388,180)	-0.2%
Average Balance	**194,362,699**	**193,254,710**	**(1,107,989)**	**-0.6%**
Working Capital Allowance	14,295,518	14,920,539	625,021	4.4%
Rate Base	**208,658,217**	**208,175,249**	**(482,968)**	**-0.2%**

Total actual Rate Base for 2016 is $482,968 or 0.2% lower than Board approved. The main reason for the variance is due to opening balances being lower than projected. In WNH's 2016 Board Approved Opening Balances, WNH anticipated more portions of the large Light Rail Transit (LRT) project to be completed and in service by the end of 2015 however a large portion of the work was completed in 2016. The project was accelerated in 2016 which was caught up at premium costs for labour and contractors (overtime and summer premiums). Working Capital Allowance was higher than projected due to higher cost of power amounts as shown in Table 2-27.

Table 2-4 2016 Actual vs 2017 Actual

Description	2016 Actual	2017 Actual	2017 Actual vs 2016 Actual	%
Net Capital Assets in Service				
Opening Balance	188,752,775	197,756,644	9,003,869	4.8%
Ending Balance	197,756,644	203,491,536	5,734,892	2.9%
Average Balance	**193,254,710**	**200,624,090**	**7,369,380**	**3.8%**
Working Capital Allowance	14,920,539	13,687,994	(1,232,545)	-8.3%
Rate Base	**208,175,249**	**214,312,084**	**6,136,835**	**2.9%**

Total actual Rate Base for 2017 is $6,136,835 or 2.9% higher than 2016 Actual. The main reason for the increase is the higher than normal net asset additions due to LRT – System Access. The final stages of LRT were completed in 2017 and therefore although the spend occurred in 2016, there was additional capitalization done in early 2017. WNH also completed the new Customer Information System (CIS) in 2017. This is offset by the Working Capital Allowance being lower than 2016 due to lower cost of power amounts as shown in Table 2-27.

Table 2-5 2017 Actual vs 2018 Actual

Description	2017 Actual	2018 Actual	2018 Actual vs 2017 Actual	%
Net Capital Assets in Service				
Opening Balance	197,756,644	203,491,536	5,734,892	2.9%
Ending Balance	203,491,536	209,979,882	6,488,346	3.2%
Average Balance	**200,624,090**	**206,735,709**	**6,111,619**	**3.0%**
Working Capital Allowance	13,687,994	13,673,082	(14,912)	-0.1%
Rate Base	**214,312,084**	**220,408,791**	**6,096,707**	**2.8%**

Total actual Rate Base for 2018 is $6,096,707 or 2.8% higher than 2017 Actual. 2017 to 2018 was a relatively normal year for net asset additions (approximately 3-4%) and there was an immaterial change in Working Capital Allowance. In 2018 WNH capitalized Phase 3 of the CIS which included system improvements and functionality however this was not a material amount. WNH also disposed of several vehicles in 2018 due to end of life.

Table 2-6 2018 Actual vs 2019 Actual

Description	2018 Actual	2019 Actual	2019 Actual vs 2018 Actual	%
Net Capital Assets in Service				
Opening Balance	203,491,536	209,979,882	6,488,346	3.2%
Ending Balance	209,979,882	217,247,818	7,267,936	3.5%
Average Balance	**206,735,709**	**213,613,850**	**6,878,141**	**3.3%**
Working Capital Allowance	13,673,082	14,086,467	413,385	3.0%
Rate Base	**220,408,791**	**227,700,317**	**7,291,526**	**3.3%**

Total actual Rate Base for 2019 is $7,291,526 or 3.3% higher than 2018 Actual. Similar to 2018, 2019 was a relatively normal year for net asset additions. WNH added new vehicles in 2019 to replace those that were disposed of in 2018. There were also higher capital costs for the transition from interval meters to Electric Smart Meters (ESM) for >50 kW customers. The Working Capital Allowance was higher than the prior year due to higher cost of power amounts as shown in Table 2-27.

Table 2-7 2019 Actual vs 2020 Bridge

Description	2019 Actual	2020 Bridge	2020 Bridge vs 2019 Actual	%
Net Capital Assets in Service				
Opening Balance	209,979,882	217,247,818	7,267,936	3.5%
Ending Balance	217,247,818	225,728,857	8,481,039	3.9%
Average Balance	**213,613,850**	**221,488,338**	**7,874,488**	**3.7%**
Working Capital Allowance	14,086,467	16,957,953	2,871,486	20.4%
Rate Base	**227,700,317**	**238,446,291**	**10,745,974**	**4.7%**

Total Rate Base for 2020 is forecasted to be $10,745,974 or 4.7% higher than 2019 Projection. Net Capital Asset Additions are planned to be level for distribution assets. Several IT systems are being completed and put into service in 2020 such as the asset management software, RNI upgrade, utility distribution design software and MDM-ODS upgrades. Some of the increases in IT were accelerated due to the feedback received during customer consultation. The Working Capital Allowance is substantially higher due to the removal of the Fair Hydro Plan with the true cost of electricity. The cost of power has increased by over 20% in 2020 from 2019 as shown in Table 2-27.

Table 2-8 2020 Bridge vs 2021 Test

Description	2020 Bridge	2021 Test	2021 Test vs 2020 Bridge	%
Net Capital Assets in Service				
Opening Balance	217,247,818	225,728,857	8,481,039	3.9%
Ending Balance	225,728,857	231,382,920	5,654,063	2.5%
Average Balance	**221,488,338**	**228,555,889**	**7,067,551**	**3.2%**
Working Capital Allowance	16,957,953	16,129,505	(828,448)	-4.9%
Rate Base	**238,446,291**	**244,685,394**	**6,239,103**	**2.6%**

Total Rate Base for 2021 is forecasted to be $6,239,103 or 2.6% higher than 2020 Bridge Year. Net Capital Additions in 2021 is planned to be lower than prior year due to the higher than normal spending in IT in 2020 partially as a response to customer preferences. WNH is planning to purchase a large truck as well as several smaller vehicles in 2021. Working Capital Allowance decreased due to lower forecasted load in 2021.

2.2.1.2 GROSS ASSETS – PROPERTY PLANT AND EQUIPMENT AND ACCUMULATED DEPRECIATION

Fixed Asset Continuity Schedules, Excluding Work in Progress (WIP)

Table 2-9 through Table 2-14 below provide the Fixed Asset Continuity Schedules excluding WIP for each of 2016 – 2019 Actuals, 2020 Bridge Year, and 2021 Test Year and are consistent with Appendix 2-BA as required in the Filing Requirements.

The “CCA Class” for fixed assets agrees with the CCA Class used for tax purposes in WNH’s tax returns. WNH has two asset classes that were different from those shown in Appendix 2-BA as provided by the Board and one asset class that has changed from the 2016 Application. For tax purposes WNH has classified Computer Software and Computer Hardware as Class 50 with a CCA rate of 55%, incorporating a 50% rule in the year of acquisition.

Depreciation is explained in further detail in the “Capitalization Policy” section of this Exhibit and Exhibit 4 – Operating Costs.

For general financial reporting purposes under IFRS, WNH does not have any material retirement of assets that are not individually identified for both the 2020 Bridge Year and the 2021 Test Year.

Table 2-9 Fixed Asset Continuity Schedule as at December 31, 2016 - MIFRS

			Cost				Accumulated Depreciation				
CCA Class	OEB	Description	Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
	1609	Capital Contributions Paid	-	-	-	-	-	-	-	-	-
12	1611	Computer Software (Formally known as Account 1925)	6,649,049	194,925	(6,542)	6,837,432	(5,758,916)	(392,516)	-	(6,151,432)	686,000
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	-	-	-	-	-	-	-	-	-
CEC	1612	Land Rights (Formally known as Account 1906)	758,776	139,141	-	897,918	-	-	-	-	897,918
N/A	1805	Land	2,323,796	-	(15,204)	2,308,592	-	-	-	-	2,308,592
47	1808	Buildings - MS	399,158	547,236	(614,212)	332,181	(241,878)	(6,219)	56,060	(192,038)	140,143
47	1808	Buildings - TS	4,327,244	295,936	-	4,623,179	(1,055,614)	(73,813)	-	(1,129,427)	3,493,753
47	1808	Buildings & Fixtures - Service Centre	20,263,861	62,502	-	20,326,363	(1,606,241)	(399,944)	-	(2,006,186)	18,320,177
47	1808	Service Centre - Parking Lot & Fence	788,824	2,075	-	790,899	(114,503)	(33,359)	-	(147,861)	643,037
47	1808	Service Centre - HVAC	3,916,531	342,376	-	4,258,907	(953,778)	(315,248)	-	(1,269,025)	2,989,881
47	1808	Service Centre - Roof	613,985	-	-	613,985	(113,209)	(33,345)	-	(146,554)	467,431
47	1808	Service Centre - Automation	50,290	-	-	50,290	(10,840)	(3,481)	-	(14,321)	35,969
47	1808	Operation Centre - Workshop	61,364	-	-	61,364	(56,491)	(150)	-	(56,641)	4,723
13	1810	Leasehold Improvements	-	-	-	-	-	-	-	-	-
47	1815	Transformer Station Equipment >50 kV	15,031,200	125,072	-	15,156,272	(9,373,292)	(570,617)	-	(9,943,909)	5,212,363
47	1815	TSE Auxiliary equipment	1,734,925	103,572	-	1,838,497	(421,736)	(64,966)	-	(486,702)	1,351,795
47	1815	TSE - P&C equipment	3,333,245	36,460	-	3,369,705	(917,743)	(255,134)	-	(1,172,878)	2,196,827
47	1815	TSE - Power transformer	12,341,512	-	-	12,341,512	(2,458,861)	(244,209)	-	(2,703,071)	9,638,442
47	1820	Distribution Station Equipment <50 kV	5,597,083	-	(473,548)	5,123,535	(3,600,290)	(89,242)	444,084	(3,245,448)	1,878,087
47	1825	Storage Battery Equipment	-	-	-	-	-	-	-	-	-
47	1830	Poles, Towers & Fixtures	69,776,950	5,079,266	-	74,856,216	(26,102,042)	(1,288,474)	-	(27,390,516)	47,465,700
47	1835	Overhead Conductors & Devices	35,646,661	2,709,950	-	38,356,611	(11,135,776)	(724,414)	-	(11,860,189)	26,496,421
47	1835	OH Manual line switches	861,524	219,182	-	1,080,705	(64,364)	(36,023)	-	(100,387)	980,318
47	1835	OH SCADA control equipment	1,641,741	783,924	-	2,425,664	(191,695)	(161,711)	-	(353,406)	2,072,258
47	1840	Underground Conduit	18,659,277	3,793,787	-	22,453,063	(8,416,805)	(326,226)	-	(8,743,031)	13,710,032
47	1845	Underground Conductors & Devices	41,226,702	11,761,670	0	52,988,372	(20,029,493)	(1,192,967)	-	(21,222,460)	31,765,912
47	1850	Line Transformers - Overhead	30,218,911	1,347,429	(199,035)	31,367,305	(14,885,540)	(443,315)	-	(15,328,855)	16,038,450
47	1850	Line Transformers - Underground	26,418,591	1,686,704	(41,033)	28,064,262	(9,207,622)	(702,144)	-	(9,909,766)	18,154,497
47	1855	Services - Overhead	10,000,235	151,283	-	10,151,518	(5,148,398)	(139,545)	-	(5,287,942)	4,863,576
47	1855	Services - Underground	16,554,336	544,346	-	17,098,682	(7,634,290)	(230,732)	-	(7,865,022)	9,233,659
47	1860	Meters - Bidirectional	35,896	-	-	35,896	(6,613)	(1,436)	-	(8,049)	27,847
47	1860	Meters - Commercial	2,859,089	791	(791)	2,859,089	(1,617,385)	(140,846)	-	(1,758,231)	1,100,858
47	1860	Meters - Residential	1,142,342	240,708	-	1,383,050	(178,874)	(82,372)	-	(261,245)	1,121,805
47	1860	Meters C& I	1,064,326	250,571	791	1,315,688	(146,258)	(87,753)	-	(234,010)	1,081,677
47	1860	Meters (Smart Meters)	7,709,608	-	-	7,709,608	(3,122,938)	(536,249)	-	(3,659,187)	4,050,421
47	1860	Meters (Wholesale)	589,064	113,659	-	702,724	(407,093)	(50,277)	-	(457,370)	245,354
N/A	1905	Land	-	-	-	-	-	-	-	-	-
47	1908	Buildings & Fixtures	-	-	-	-	-	-	-	-	-

1

			Cost				Accumulated Depreciation				
CCA Class	**OEB**	**Description**	**Opening Balance**	**Additions**	**Disposals**	**Closing Balance**	**Opening Balance**	**Additions**	**Disposals**	**Closing Balance**	**Net Book Value**
13	1910	Leasehold Improvements	-	-	-	-	-	-	-	-	-
8	1915	Office Furniture & Equipment (10 years)	1,567,318	16,709	-	1,584,027	(1,006,594)	(108,298)	-	(1,114,892)	469,134
8	1915	Office Furniture & Equipment (5 years)	10,005	7,510	-	17,515	(10,005)	(1,502)	-	(11,507)	6,008
10	1920	Computer Equipment - Hardware	-	-	-	-	-	-	-	-	-
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	-	-	-	-	-	-	-	-	-
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	4,196,117	140,467	6,542	4,343,126	(3,909,627)	(146,296)	-	(4,055,923)	287,204
10	1930	Transportation Equipment - car	37,162	-	-	37,162	(29,729)	(7,432)	-	(37,162)	-
10	1930	Transportation Equipment - Other - trailers etc	737,547	60,735	-	798,282	(346,962)	(40,259)	-	(387,221)	411,061
10	1930	Transportation Equipment - small trucks	1,650,798	56,784	(30,206)	1,677,376	(1,201,896)	(135,638)	30,206	(1,307,327)	370,049
10	1930	Transportation Equipment - workplatform	6,438,668	460,120	(257,176)	6,641,612	(3,739,329)	(367,292)	246,189	(3,860,431)	2,781,181
10	1930	Transportation Equipment - Hybrid system	325,429	-	(73,455)	251,975	(157,538)	(54,233)	44,073	(167,699)	84,276
8	1935	Stores Equipment	544,135	111,785	-	655,921	(334,794)	(58,283)	-	(393,077)	262,844
8	1940	Tools, Shop & Garage Equipment	320,661	1,259	-	321,919	(199,479)	(35,109)	-	(234,588)	87,331
8	1940	Truck tools	1,126,122	56,954	-	1,183,076	(932,857)	(88,428)	-	(1,021,286)	161,790
8	1945	Measurement & Testing Equipment	936,864	1,228	-	938,092	(822,060)	(43,447)	-	(865,506)	72,585
8	1950	Power Operated Equipment	-	-	-	-	-	-	-	-	-
8	1955	Communications Equipment - phones	583,791	1,092	-	584,883	(361,860)	(48,369)	-	(410,229)	174,654
8	1955	Communications Equipment - Radio wireless	169,773	52,391	-	222,164	(137,478)	(31,588)	-	(169,066)	53,098
8	1955	Communications Equipment - Radio	176,199	-	-	176,199	(107,047)	(17,620)	-	(124,667)	51,532
8	1955	Communication Equipment (Smart Meters)	-	-	-	-	-	-	-	-	-
8	1960	Miscellaneous Equipment	2,643,170	2,507	-	2,645,677	(1,715,551)	(243,770)	-	(1,959,320)	686,357
47	1970	Load Management Controls Customer Premises	-	-	-	-	-	-	-	-	-
47	1975	Load Management Controls Utility Premises	-	-	-	-	-	-	-	-	-
47	1980	System Supervisor Equipment	5,049,580	64,976	-	5,114,556	(2,934,947)	(211,422)	-	(3,146,369)	1,968,187
47	1985	Miscellaneous Fixed Assets	-	-	-	-	-	-	-	-	-
47	1990	Other Tangible Property	-	-	-	-	-	-	-	-	-
47	1995	Contributions & Grants	(31,831,420)	-	-	(31,831,420)	10,448,904	739,530	-	11,188,434	(20,642,986)
47	2440	Deferred Revenue - 1808	-	(24,595)	-	(24,595)	-	1,640	-	1,640	(22,956)
47	2440	Deferred Revenue - 1830	(860,428)	(394,191)	-	(1,254,619)	24,878	27,880	-	52,759	(1,201,861)
47	2440	Deferred Revenue - 1835	(488,364)	(223,569)	-	(711,932)	14,136	15,821	-	29,957	(681,976)
47	2440	Deferred Revenue - 1840	(615,175)	(2,345,593)	-	(2,960,768)	13,811	59,215	-	73,027	(2,887,742)
47	2440	Deferred Revenue - 1845	(1,473,793)	(5,614,022)	-	(7,087,815)	47,695	202,509	-	250,204	(6,837,610)
47	2440	Deferred Revenue - 1850	(2,134,627)	(3,637,536)	-	(5,772,162)	72,980	151,899	-	224,879	(5,547,284)
47	2440	Deferred Revenue - 1855	(650,041)	(379,700)	-	(1,029,741)	18,594	21,015	-	39,609	(990,132)
47	2440	Deferred Revenue - 1860	(19,860)	(16,999)	-	(36,859)	2,379	2,457	-	4,836	(32,023)
	2005	Property Under Finance Lease	-			-	-			-	-
						-				-	-
		Sub-Total	**331,035,728**	**18,930,875**	**(1,703,869)**	**348,262,733**	**(142,282,955)**	**(9,043,746)**	**820,612**	**(150,506,088)**	**197,756,645**
		Less Socialized Renewable Energy Generation Investments (input as negative)				-				-	-
		Less Other Non Rate-Regulated Utility Assets (input as negative)				-				-	-
		Total PP&E	**331,035,728**	**18,930,875**	**(1,703,869)**	**348,262,733**	**(142,282,955)**	**(9,043,746)**	**820,612**	**(150,506,088)**	**197,756,645**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable									
		Total						**(9,043,746)**			

Less: Fully Allocated Depreciation	
Transportation	(728,392)
Stores Equipment	(58,283)
Deferred Revenue	482,437
Net Depreciation	**(8,739,508)**

Table 2-10 Fixed Asset Continuity Schedule as at December 31, 2017 - MIFRS

			Cost				Accumulated Depreciation				
CCA Class	OEB	Description	Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
	1609	Capital Contributions Paid	-	-	-	-	-	-	-	-	-
12	1611	Computer Software (Formally known as Account 1925)	6,837,432	327,877	-	7,165,309	(6,151,432)	(351,559)	-	(6,502,990)	662,319
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	-	1,432,721	-	1,432,721	-	(143,272)	-	(143,272)	1,289,449
CEC	1612	Land Rights (Formally known as Account 1906)	897,918	84,332	-	982,250	-	-	-	-	982,250
N/A	1805	Land	2,308,592	-	(8,051)	2,300,541	-	-	-	-	2,300,541
47	1808	Buildings - MS	332,181	281,921	(335,104)	278,998	(192,038)	(5,345)	33,637	(163,745)	115,252
47	1808	Buildings - TS	4,623,179	22,431	-	4,645,611	(1,129,427)	(74,186)	-	(1,203,613)	3,441,997
47	1808	Buildings & Fixtures - Service Centre	20,326,363	180,234	-	20,506,597	(2,006,186)	(403,549)	-	(2,409,734)	18,096,862
47	1808	Service Centre - Parking Lot & Fence	790,899	-	-	790,899	(147,861)	(33,359)	-	(181,220)	609,679
47	1808	Service Centre - HVAC	4,258,907	6,583	-	4,265,490	(1,269,025)	(315,687)	-	(1,584,712)	2,680,778
47	1808	Service Centre - Roof	613,985	-	-	613,985	(146,554)	(33,345)	-	(179,899)	434,086
47	1808	Service Centre - Automation	50,290	-	-	50,290	(14,321)	(3,481)	-	(17,802)	32,488
47	1808	Operation Centre - Workshop	61,364	-	-	61,364	(56,641)	(150)	-	(56,791)	4,573
13	1810	Leasehold Improvements	-	-	-	-	-	-	-	-	-
47	1815	Transformer Station Equipment >50 kV	15,156,272	18,670	-	15,174,942	(9,943,909)	(570,428)	-	(10,514,337)	4,660,605
47	1815	TSE Auxiliary equipment	1,838,497	137,102	-	1,975,600	(486,702)	(69,536)	-	(556,238)	1,419,362
47	1815	TSE - P&C equipment	3,369,705	152,863	-	3,522,568	(1,172,878)	(265,563)	-	(1,438,441)	2,084,128
47	1815	TSE - Power transformer	12,341,512	-	-	12,341,512	(2,703,071)	(244,209)	-	(2,947,280)	9,394,232
47	1820	Distribution Station Equipment <50 kV	5,123,535	339,763	(301,984)	5,161,314	(3,245,448)	(96,618)	292,274	(3,049,792)	2,111,523
47	1825	Storage Battery Equipment	-	-	-	-	-	-	-	-	-
47	1830	Poles, Towers & Fixtures	74,856,216	4,737,205	(34,999)	79,558,421	(27,390,516)	(1,393,433)	27,891	(28,756,058)	50,802,363
47	1835	Overhead Conductors & Devices	38,356,611	2,794,117	-	41,150,728	(11,860,189)	(786,505)	-	(12,646,695)	28,504,033
47	1835	OH Manual line switches	1,080,705	207,230	-	1,287,936	(100,387)	(42,931)	-	(143,318)	1,144,617
47	1835	OH SCADA control equipment	2,425,664	10,080	-	2,435,744	(353,406)	(162,383)	-	(515,789)	1,919,955
47	1840	Underground Conduit	22,453,063	956,850	-	23,409,914	(8,743,031)	(345,363)	-	(9,088,394)	14,321,520
47	1845	Underground Conductors & Devices	52,988,372	2,533,856	-	55,522,228	(21,222,460)	(1,255,035)	-	(22,477,496)	33,044,733
47	1850	Line Transformers - Overhead	31,367,305	1,862,119	(340,865)	32,888,559	(15,328,855)	(478,161)	74,754	(15,732,262)	17,156,297
47	1850	Line Transformers - Underground	28,064,262	1,688,856	(115,605)	29,637,513	(9,909,766)	(746,597)	2,897	(10,653,466)	18,984,047
47	1855	Services - Overhead	10,151,518	258,767	-	10,410,285	(5,287,942)	(145,295)	-	(5,433,238)	4,977,048
47	1855	Services - Underground	17,098,682	962,103	-	18,060,785	(7,865,022)	(249,974)	-	(8,114,997)	9,945,789
47	1860	Meters - Bidirectional	35,896	-	-	35,896	(8,049)	(1,436)	-	(9,485)	26,411
47	1860	Meters - Commercial	2,859,089	-	-	2,859,089	(1,758,231)	(135,970)	-	(1,894,201)	964,888
47	1860	Meters - Residential	1,383,050	248,474	-	1,631,524	(261,245)	(98,937)	-	(360,182)	1,271,342
47	1860	Meters C& I	1,315,688	398,573	-	1,714,261	(234,010)	(114,324)	-	(348,335)	1,365,926
47	1860	Meters (Smart Meters)	7,709,608	-	-	7,709,608	(3,659,187)	(536,249)	-	(4,195,435)	3,514,173
47	1860	Meters (Wholesale)	702,724	70,547	-	773,270	(457,370)	(54,980)	-	(512,349)	260,921
N/A	1905	Land	-	-	-	-	-	-	-	-	-
47	1908	Buildings & Fixtures	-	-	-	-	-	-	-	-	-

1

			Cost				Accumulated Depreciation				
CCA Class	**OEB**	**Description**	**Opening Balance**	**Additions**	**Disposals**	**Closing Balance**	**Opening Balance**	**Additions**	**Disposals**	**Closing Balance**	**Net Book Value**
13	1910	Leasehold Improvements	-	-	-	-	-	-	-	-	-
8	1915	Office Furniture & Equipment (10 years)	1,584,027	2,710	-	1,586,737	(1,114,892)	(106,150)	-	(1,221,043)	365,694
8	1915	Office Furniture & Equipment (5 years)	17,515	22,557	-	40,073	(11,507)	(6,014)	-	(17,521)	22,552
10	1920	Computer Equipment - Hardware	-	-	-	-	-	-	-	-	-
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	-	-	-	-	-	-	-	-	-
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	4,343,126	122,517	-	4,465,644	(4,055,923)	(130,052)	-	(4,185,975)	279,669
10	1930	Transportation Equipment - car	37,162	-	-	37,162	(37,162)	-	-	(37,162)	-
10	1930	Transportation Equipment - Other - trailers etc	798,282	25,471	-	823,752	(387,221)	(41,957)	-	(429,178)	394,575
10	1930	Transportation Equipment - small trucks	1,677,376	38,239	(86,177)	1,629,438	(1,307,327)	(136,940)	85,760	(1,358,507)	270,931
10	1930	Transportation Equipment - workplatform	6,641,612	449,181	(279,323)	6,811,471	(3,860,431)	(403,651)	274,922	(3,989,160)	2,822,311
10	1930	Transportation Equipment - Hybrid system	251,975	-	(59,250)	192,725	(167,699)	(31,126)	23,700	(175,125)	17,600
8	1935	Stores Equipment	655,921	1,000	-	656,921	(393,077)	(58,383)	-	(451,460)	205,460
8	1940	Tools, Shop & Garage Equipment	321,919	5,100	-	327,019	(234,588)	(35,747)	-	(270,335)	56,684
8	1940	Truck tools	1,183,076	27,470	-	1,210,546	(1,021,286)	(72,697)	-	(1,093,983)	116,564
8	1945	Measurement & Testing Equipment	938,092	29,045	-	967,137	(865,506)	(42,792)	-	(908,299)	58,838
8	1950	Power Operated Equipment	-	-	-	-	-	-	-	-	-
8	1955	Communications Equipment - phones	584,883	-	-	584,883	(410,229)	(43,601)	-	(453,829)	131,053
8	1955	Communications Equipment - Radio wireless	222,164	-	-	222,164	(169,066)	(9,850)	-	(178,916)	43,248
8	1955	Communications Equipment - Radio	176,199	-	-	176,199	(124,667)	(17,620)	-	(142,287)	33,912
8	1955	Communication Equipment (Smart Meters)	-	-	-	-	-	-	-	-	-
8	1960	Miscellaneous Equipment	2,645,677	21,067	(2,507)	2,664,237	(1,959,320)	(239,438)	-	(2,198,758)	465,479
47	1970	Load Management Controls Customer Premises	-	-	-	-	-	-	-	-	-
47	1975	Load Management Controls Utility Premises	-	-	-	-	-	-	-	-	-
47	1980	System Supervisor Equipment	5,114,556	12,466	-	5,127,022	(3,146,369)	(212,021)	-	(3,358,390)	1,768,632
47	1985	Miscellaneous Fixed Assets	-	-	-	-	-	-	-	-	-
47	1990	Other Tangible Property	-	-	-	-	-	-	-	-	-
47	1995	Contributions & Grants	(31,831,420)	-	-	(31,831,420)	11,188,434	738,533	-	11,926,967	(19,904,453)
47	2440	Deferred Revenue - 1808	(24,595)	-	-	(24,595)	1,640	1,640	-	3,279	(21,316)
47	2440	Deferred Revenue - 1830	(1,254,619)	(352,048)	-	(1,606,668)	52,759	35,704	-	88,462	(1,518,205)
47	2440	Deferred Revenue - 1835	(711,932)	(199,867)	-	(911,799)	29,957	20,262	-	50,219	(861,580)
47	2440	Deferred Revenue - 1840	(2,960,768)	(547,330)	-	(3,508,098)	73,027	70,162	-	143,189	(3,364,909)
47	2440	Deferred Revenue - 1845	(7,087,815)	(1,387,526)	-	(8,475,341)	250,204	242,153	-	492,357	(7,982,984)
47	2440	Deferred Revenue - 1850	(5,772,162)	(1,637,062)	-	(7,409,224)	224,879	194,980	-	419,858	(6,989,366)
47	2440	Deferred Revenue - 1855	(1,029,741)	(432,271)	-	(1,462,012)	39,609	29,837	-	69,446	(1,392,566)
47	2440	Deferred Revenue - 1860	(36,859)	(22,397)	-	(59,256)	4,836	3,950	-	8,786	(50,470)
	2005	Property Under Finance Lease	-			-	-			-	-
						-				-	-
		Sub-Total	**348,262,733**	**15,891,597**	**(1,563,864)**	**362,590,466**	**(150,506,088)**	**(9,408,679)**	**815,837**	**(159,098,930)**	**203,491,536**
		Less Socialized Renewable Energy Generation Investments (input as negative)				-				-	-
		Less Other Non Rate-Regulated Utility Assets (input as negative)				-				-	-
		Total PP&E	**348,262,733**	**15,891,597**	**(1,563,864)**	**362,590,466**	**(150,506,088)**	**(9,408,679)**	**815,837**	**(159,098,930)**	**203,491,536**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable									
		Total						**(9,408,679)**			

Less: Fully Allocated Depreciation	
Transportation	(722,118)
Store Equipment	(58,383)
Deferred Revenue	598,687
Net Depreciation	**(9,226,865)**

Table 2-11 Fixed Asset Continuity Schedule as at December 31, 2018 - MIFRS

			Cost				Accumulated Depreciation				
CCA Class	OEB	Description	Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
	1609	Capital Contributions Paid	-	-	-	-	-	-	-	-	-
12	1611	Computer Software (Formally known as Account 1925)	7,165,309	529,216	-	7,694,525	(6,502,990)	(388,743)	-	(6,891,733)	802,792
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	1,432,721	451,355	-	1,884,075	(143,272)	(188,407)	-	(331,679)	1,552,396
CEC	1612	Land Rights (Formally known as Account 1906)	982,250	77,375	-	1,059,625	-	-	-	-	1,059,625
N/A	1805	Land	2,300,541	-	-	2,300,541	-	-	-	-	2,300,541
47	1808	Buildings - MS	278,998	-	-	278,998	(163,745)	(5,345)	-	(169,090)	109,908
47	1808	Buildings - TS	4,645,611	109,904	-	4,755,515	(1,203,613)	(76,018)	-	(1,279,631)	3,475,883
47	1808	Buildings & Fixtures - Service Centre	20,506,597	4,930	-	20,511,527	(2,409,734)	(403,648)	-	(2,813,382)	17,698,145
47	1808	Service Centre - Parking Lot & Fence	790,899	25,465	-	816,364	(181,220)	(34,377)	-	(215,597)	600,767
47	1808	Service Centre - HVAC	4,265,490	-	-	4,265,490	(1,584,712)	(315,687)	-	(1,900,398)	2,365,091
47	1808	Service Centre - Roof	613,985	-	-	613,985	(179,899)	(33,345)	-	(213,245)	400,740
47	1808	Service Centre - Automation	50,290	-	-	50,290	(17,802)	(3,481)	-	(21,283)	29,006
47	1808	Operation Centre - Workshop	61,364	-	-	61,364	(56,791)	(150)	-	(56,941)	4,423
13	1810	Leasehold Improvements	-	-	-	-	-	-	-	-	-
47	1815	Transformer Station Equipment >50 kV	15,174,942	98,732	-	15,273,674	(10,514,337)	(487,292)	-	(11,001,629)	4,272,044
47	1815	TSE Auxiliary equipment	1,975,600	232,516	-	2,208,116	(556,238)	(77,286)	-	(633,525)	1,574,591
47	1815	TSE - P&C equipment	3,522,568	444,071	-	3,966,639	(1,438,441)	(295,166)	-	(1,733,607)	2,233,032
47	1815	TSE - Power transformer	12,341,512	83,676	-	12,425,189	(2,947,280)	(245,883)	-	(3,193,163)	9,232,026
47	1820	Distribution Station Equipment <50 kV	5,161,314	-	-	5,161,314	(3,049,792)	(91,778)	-	(3,141,569)	2,019,745
47	1825	Storage Battery Equipment	-	-	-	-	-	-	-	-	-
47	1830	Poles, Towers & Fixtures	79,558,421	4,736,272	-	84,294,693	(28,756,058)	(1,498,684)	-	(30,254,742)	54,039,951
47	1835	Overhead Conductors & Devices	41,150,728	2,582,727	-	43,733,455	(12,646,695)	(825,162)	-	(13,471,857)	30,261,598
47	1835	OH Manual line switches	1,287,936	175,379	-	1,463,314	(143,318)	(48,777)	-	(192,095)	1,271,219
47	1835	OH SCADA control equipment	2,435,744	25,686	-	2,461,430	(515,789)	(164,095)	-	(679,885)	1,781,546
47	1840	Underground Conduit	23,409,914	1,440,326	-	24,850,240	(9,088,394)	(374,169)	-	(9,462,563)	15,387,677
47	1845	Underground Conductors & Devices	55,522,228	2,619,170	-	58,141,398	(22,477,496)	(1,323,798)	-	(23,801,294)	34,340,105
47	1850	Line Transformers - Overhead	32,888,559	1,579,217	(197,800)	34,269,976	(15,732,262)	(508,425)	-	(16,240,688)	18,029,288
47	1850	Line Transformers - Underground	29,637,513	1,409,098	(92,215)	30,954,396	(10,653,466)	(783,777)	-	(11,437,243)	19,517,154
47	1855	Services - Overhead	10,410,285	314,093	-	10,724,378	(5,433,238)	(152,275)	-	(5,585,513)	5,138,866
47	1855	Services - Underground	18,060,785	714,805	-	18,775,591	(8,114,997)	(264,270)	-	(8,379,267)	10,396,324
47	1860	Meters - Bidirectional	35,896	11,943	-	47,838	(9,485)	(1,914)	-	(11,398)	36,440
47	1860	Meters - Commercial	2,859,089	-	-	2,859,089	(1,894,201)	(133,286)	-	(2,027,487)	831,602
47	1860	Meters - Residential	1,631,524	300,697	-	1,932,220	(360,182)	(118,983)	-	(479,165)	1,453,055
47	1860	Meters C& I	1,714,261	209,740	-	1,924,000	(348,335)	(128,307)	-	(476,641)	1,447,359
47	1860	Meters (Smart Meters)	7,709,608	-	-	7,709,608	(4,195,435)	(536,249)	-	(4,731,684)	2,977,924
47	1860	Meters (Wholesale)	773,270	-	-	773,270	(512,349)	(54,781)	-	(567,130)	206,140
N/A	1905	Land	-	-	-	-	-	-	-	-	-
47	1908	Buildings & Fixtures	-	-	-	-	-	-	-	-	-

1

			Cost				Accumulated Depreciation				
CCA Class	**OEB**	**Description**	**Opening Balance**	**Additions**	**Disposals**	**Closing Balance**	**Opening Balance**	**Additions**	**Disposals**	**Closing Balance**	**Net Book Value**
13	1910	Leasehold Improvements	-	-	-	-	-	-	-	-	-
8	1915	Office Furniture & Equipment (10 years)	1,586,737	12,409	-	1,599,146	(1,221,043)	(106,845)	-	(1,327,888)	271,258
8	1915	Office Furniture & Equipment (5 years)	40,073	45,818	-	85,891	(17,521)	(15,177)	-	(32,698)	53,193
10	1920	Computer Equipment - Hardware	-	-	-	-	-	-	-	-	-
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	-	-	-	-	-	-	-	-	-
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	4,465,644	202,146	-	4,667,790	(4,185,975)	(152,911)	-	(4,338,886)	328,904
10	1930	Transportation Equipment - car	37,162	-	-	37,162	(37,162)	-	-	(37,162)	-
10	1930	Transportation Equipment - Other - trailers etc	823,752	3,744	-	827,496	(429,178)	(42,207)	-	(471,384)	356,112
10	1930	Transportation Equipment - small trucks	1,629,438	-	(96,120)	1,533,318	(1,358,507)	(127,729)	96,120	(1,390,116)	143,202
10	1930	Transportation Equipment - workplatform	6,811,471	497,426	(1,079,524)	6,229,372	(3,989,160)	(432,602)	1,035,121	(3,386,640)	2,842,732
10	1930	Transportation Equipment - Hybrid system	192,725	5,843	(198,567)	-	(175,125)	-	175,125	-	-
8	1935	Stores Equipment	656,921	43,802	(2,811)	697,911	(451,460)	(52,563)	2,530	(501,493)	196,418
8	1940	Tools, Shop & Garage Equipment	327,019	3,200	-	330,219	(270,335)	(36,147)	-	(306,482)	23,737
8	1940	Truck tools	1,210,546	83,355	-	1,293,901	(1,093,983)	(75,105)	-	(1,169,087)	124,814
8	1945	Measurement & Testing Equipment	967,137	37,821	-	1,004,958	(908,299)	(29,779)	-	(938,078)	66,880
8	1950	Power Operated Equipment	-	-	-	-	-	-	-	-	-
8	1955	Communications Equipment - phones	584,883	-	-	584,883	(453,829)	(43,601)	-	(497,430)	87,453
8	1955	Communications Equipment - Radio wireless	222,164	-	-	222,164	(178,916)	(8,964)	-	(187,880)	34,284
8	1955	Communications Equipment - Radio	176,199	-	-	176,199	(142,287)	(17,620)	-	(159,907)	16,292
8	1955	Communication Equipment (Smart Meters)	-	-	-	-	-	-	-	-	-
8	1960	Miscellaneous Equipment	2,664,237	38,743	-	2,702,981	(2,198,758)	(192,673)	-	(2,391,432)	311,549
47	1970	Load Management Controls Customer Premises	-	-	-	-	-	-	-	-	-
47	1975	Load Management Controls Utility Premises	-	-	-	-	-	-	-	-	-
47	1980	System Supervisor Equipment	5,127,022	386,732	-	5,513,754	(3,358,390)	(234,790)	-	(3,593,180)	1,920,574
47	1985	Miscellaneous Fixed Assets	-	-	-	-	-	-	-	-	-
47	1990	Other Tangible Property	-	-	-	-	-	-	-	-	-
47	1995	Contributions & Grants	(31,831,420)	-	-	(31,831,420)	11,926,967	737,255	-	12,664,222	(19,167,198)
47	2440	Deferred Revenue - 1808	(24,595)	-	-	(24,595)	3,279	1,640	-	4,919	(19,676)
47	2440	Deferred Revenue - 1830	(1,606,668)	(386,171)	-	(1,992,838)	88,462	44,285	-	132,748	(1,860,091)
47	2440	Deferred Revenue - 1835	(911,799)	(219,954)	-	(1,131,753)	50,219	25,150	-	75,369	(1,056,384)
47	2440	Deferred Revenue - 1840	(3,508,098)	(286,098)	-	(3,794,195)	143,189	75,884	-	219,072	(3,575,123)
47	2440	Deferred Revenue - 1845	(8,475,341)	(717,985)	-	(9,193,326)	492,357	262,666	-	755,023	(8,438,302)
47	2440	Deferred Revenue - 1850	(7,409,224)	(1,043,279)	-	(8,452,504)	419,858	222,434	-	642,292	(7,810,211)
47	2440	Deferred Revenue - 1855	(1,462,012)	(299,940)	-	(1,761,952)	69,446	35,958	-	105,404	(1,656,548)
47	2440	Deferred Revenue - 1860	(59,256)	(15,503)	-	(74,760)	8,786	4,984	-	13,770	(60,989)
	2005	Property Under Finance Lease	-			-	-			-	-
						-				-	-
		Sub-Total	**362,590,466**	**16,568,500**	**(1,667,037)**	**377,491,930**	**(159,098,930)**	**(9,722,013)**	**1,308,895**	**(167,512,047)**	**209,979,882**
		Less Socialized Renewable Energy Generation Investments (input as negative)				-				-	-
		Less Other Non Rate-Regulated Utility Assets (input as negative)				-				-	-
		Total PP&E	**362,590,466**	**16,568,500**	**(1,667,037)**	**377,491,930**	**(159,098,930)**	**(9,722,013)**	**1,308,895**	**(167,512,047)**	**209,979,882**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable									
		Total						**(9,722,013)**			

Less: Fully Allocated Depreciation	
Transportation	(713,788)
Stores Equipment	(52,563)
Deferred Revenue	673,002
Net Depreciation	**(9,628,663)**

Table 2-12 Fixed Asset Continuity Schedule as at December 31, 2019 – MIFRS

			Cost				Accumulated Depreciation				
CCA Class	OEB	Description	Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
	1609	Capital Contributions Paid	-	-	-	-	-	-	-	-	-
12	1611	Computer Software (Formally known as Account 1925)	7,694,525	235,998	-	7,930,523	(6,891,733)	(363,635)	-	(7,255,368)	675,155
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	1,884,075	-	-	1,884,075	(331,679)	(188,408)	-	(520,087)	1,363,988
CEC	1612	Land Rights (Formally known as Account 1906)	1,059,625	64,686	-	1,124,311	-	-	-	-	1,124,311
N/A	1805	Land	2,300,541	-	-	2,300,541	-	-	-	-	2,300,541
47	1808	Buildings - MS	278,998	-	-	278,998	(169,090)	(5,345)	-	(174,435)	104,563
47	1808	Buildings - TS	4,755,515	53,214	-	4,808,728	(1,279,631)	(76,905)	-	(1,356,536)	3,452,192
47	1808	Buildings & Fixtures - Service Centre	20,511,527	-	-	20,511,527	(2,813,382)	(403,647)	-	(3,217,030)	17,294,497
47	1808	Service Centre - Parking Lot & Fence	816,364	-	-	816,364	(215,597)	(34,377)	-	(249,975)	566,389
47	1808	Service Centre - HVAC	4,265,490	8,004	-	4,273,493	(1,900,398)	(316,220)	-	(2,216,619)	2,056,875
47	1808	Service Centre - Roof	613,985	-	-	613,985	(213,245)	(33,345)	-	(246,590)	367,395
47	1808	Service Centre - Automation	50,290	-	-	50,290	(21,283)	(3,481)	-	(24,765)	25,525
47	1808	Operation Centre - Workshop	61,364	-	-	61,364	(56,941)	(150)	-	(57,091)	4,273
13	1810	Leasehold Improvements	-	-	-	-	-	-	-	-	-
47	1815	Transformer Station Equipment >50 kV	15,273,674	-	-	15,273,674	(11,001,629)	(444,212)	-	(11,445,841)	3,827,832
47	1815	TSE Auxiliary equipment	2,208,116	424,045	-	2,632,161	(633,525)	(91,421)	-	(724,946)	1,907,215
47	1815	TSE - P&C equipment	3,966,639	83,160	-	4,049,798	(1,733,607)	(300,711)	-	(2,034,318)	2,015,481
47	1815	TSE - Power transformer	12,425,189	-	-	12,425,189	(3,193,163)	(245,883)	-	(3,439,045)	8,986,143
47	1820	Distribution Station Equipment <50 kV	5,161,314	-	-	5,161,314	(3,141,569)	(89,926)	-	(3,231,496)	1,929,819
47	1825	Storage Battery Equipment	-	-	-	-	-	-	-	-	-
47	1830	Poles, Towers & Fixtures	84,294,693	4,018,102	-	88,312,795	(30,254,742)	(1,587,975)	-	(31,842,717)	56,470,078
47	1835	Overhead Conductors & Devices	43,733,455	2,345,712	-	46,079,167	(13,471,857)	(857,700)	-	(14,329,557)	31,749,610
47	1835	OH Manual line switches	1,463,314	174,683	-	1,637,997	(192,095)	(54,600)	-	(246,695)	1,391,303
47	1835	OH SCADA control equipment	2,461,430	322,165	-	2,783,596	(679,885)	(185,573)	-	(865,458)	1,918,138
47	1840	Underground Conduit	24,850,240	1,477,608	-	26,327,848	(9,462,563)	(403,728)	-	(9,866,291)	16,461,558
47	1845	Underground Conductors & Devices	58,141,398	2,380,771	-	60,522,169	(23,801,294)	(1,381,279)	-	(25,182,573)	35,339,597
47	1850	Line Transformers - Overhead	34,269,976	1,571,027	(240,634)	35,600,369	(16,240,688)	(542,046)	-	(16,782,734)	18,817,635
47	1850	Line Transformers - Underground	30,954,396	2,117,840	-	33,072,236	(11,437,243)	(846,209)	-	(12,283,452)	20,788,784
47	1855	Services - Overhead	10,724,378	253,197	-	10,977,575	(5,585,513)	(157,902)	-	(5,743,414)	5,234,161
47	1855	Services - Underground	18,775,591	952,186	-	19,727,776	(8,379,267)	(283,314)	-	(8,662,580)	11,065,196
47	1860	Meters - Bidirectional	47,838	46,152	-	93,991	(11,398)	(3,760)	-	(15,158)	78,833
47	1860	Meters - Commercial	2,859,089	-	-	2,859,089	(2,027,487)	(131,879)	-	(2,159,366)	699,723
47	1860	Meters - Residential	1,932,220	303,728	-	2,235,949	(479,165)	(139,232)	-	(618,397)	1,617,551
47	1860	Meters C& I	1,924,000	563,686	-	2,487,686	(476,641)	(165,886)	-	(642,527)	1,845,159
47	1860	Meters (Smart Meters)	7,709,608	-	-	7,709,608	(4,731,684)	(536,249)	-	(5,267,933)	2,441,675
47	1860	Meters (Wholesale)	773,270	270,831	-	1,044,101	(567,130)	(47,074)	-	(614,204)	429,897
N/A	1905	Land	-	-	-	-	-	-	-	-	-
47	1908	Buildings & Fixtures	-	-	-	-	-	-	-	-	-

			Cost				Accumulated Depreciation				
CCA Class	OEB	Description	Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
13	1910	Leasehold Improvements	-	-	-	-	-	-	-	-	-
8	1915	Office Furniture & Equipment (10 years)	1,599,146	5,094	-	1,604,240	(1,327,888)	(105,471)	-	(1,433,359)	170,880
8	1915	Office Furniture & Equipment (5 years)	85,891	28,391	-	114,282	(32,698)	(20,855)	-	(53,553)	60,729
10	1920	Computer Equipment - Hardware	-	-	-	-	-	-	-	-	-
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	-	-	-	-	-	-	-	-	-
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	4,667,790	226,841	-	4,894,631	(4,338,886)	(167,864)	-	(4,506,750)	387,881
10	1930	Transportation Equipment - car	37,162	-	-	37,162	(37,162)	-	-	(37,162)	-
10	1930	Transportation Equipment - Other - trailers etc	827,496	60,675	-	888,171	(471,384)	(46,251)	-	(517,635)	370,535
10	1930	Transportation Equipment - small trucks	1,533,318	243,175	(31,438)	1,745,055	(1,390,116)	(102,942)	31,438	(1,461,620)	283,435
10	1930	Transportation Equipment - workplatform	6,229,372	414,438	-	6,643,811	(3,386,640)	(457,794)	-	(3,844,434)	2,799,376
10	1930	Transportation Equipment - Hybrid system	-	-	-	-	-	-	-	-	-
8	1935	Stores Equipment	697,911	-	-	697,911	(501,493)	(52,563)	-	(554,056)	143,855
8	1940	Tools, Shop & Garage Equipment	330,219	24,230	-	354,449	(306,482)	(15,401)	-	(321,883)	32,567
8	1940	Truck tools	1,293,901	41,020	-	1,334,921	(1,169,087)	(60,626)	-	(1,229,713)	105,208
8	1945	Measurement & Testing Equipment	1,004,958	33,320	-	1,038,278	(938,078)	(20,999)	-	(959,077)	79,201
8	1950	Power Operated Equipment	-	-	-	-	-	-	-	-	-
8	1955	Communications Equipment - phones	584,883	188,899	(537,610)	236,172	(497,430)	(23,617)	468,194	(52,853)	183,319
8	1955	Communications Equipment - Radio wireless	222,164	-	-	222,164	(187,880)	(7,838)	-	(195,718)	26,447
8	1955	Communications Equipment - Radio	176,199	1,292	-	177,491	(159,907)	(6,978)	-	(166,885)	10,606
8	1955	Communication Equipment (Smart Meters)	-	-	-	-	-	-	-	-	-
8	1960	Miscellaneous Equipment	2,702,981	12,422	-	2,715,403	(2,391,432)	(135,933)	-	(2,527,365)	188,038
47	1970	Load Management Controls Customer Premises	-	-	-	-	-	-	-	-	-
47	1975	Load Management Controls Utility Premises	-	-	-	-	-	-	-	-	-
47	1980	System Supervisor Equipment	5,513,754	704,479	-	6,218,233	(3,593,180)	(276,289)	-	(3,869,469)	2,348,764
47	1985	Miscellaneous Fixed Assets	-	-	-	-	-	-	-	-	-
47	1990	Other Tangible Property	-	-	-	-	-	-	-	-	-
47	1995	Contributions & Grants	(31,831,420)	-	-	(31,831,420)	12,664,222	735,693	-	13,399,915	(18,431,505)
47	2440	Deferred Revenue - 1808	(24,595)	-	-	(24,595)	4,919	1,228	-	6,147	(18,448)
47	2440	Deferred Revenue - 1830	(1,992,838)	(254,510)	-	(2,247,348)	132,748	49,941	-	182,689	(2,064,659)
47	2440	Deferred Revenue - 1835	(1,131,753)	(146,280)	-	(1,278,033)	75,369	28,401	-	103,770	(1,174,263)
47	2440	Deferred Revenue - 1840	(3,794,195)	(54,976)	-	(3,849,172)	219,072	76,983	-	296,056	(3,553,116)
47	2440	Deferred Revenue - 1845	(9,193,326)	(183,847)	-	(9,377,173)	755,023	267,919	-	1,022,943	(8,354,230)
47	2440	Deferred Revenue - 1850	(8,452,504)	(961,075)	-	(9,413,578)	642,292	247,726	-	890,018	(8,523,560)
47	2440	Deferred Revenue - 1855	(1,761,952)	(464,805)	-	(2,226,757)	105,404	45,444	-	150,848	(2,075,909)
47	2440	Deferred Revenue - 1860	(74,760)	(45,447)	-	(120,207)	13,770	8,014	-	21,784	(98,423)
	2005	Property Under Finance Lease	-			-	-			-	-
						-				-	-
		Sub-Total	**377,491,930**	**17,540,132**	**(809,683)**	**394,222,378**	**(167,512,047)**	**(9,962,145)**	**499,633**	**(176,974,559)**	**217,247,819**
		Less Socialized Renewable Energy Generation Investments (input as negative)				-				-	-
		Less Other Non Rate-Regulated Utility Assets (input as negative)				-				-	-
		Total PP&E	**377,491,930**	**17,540,132**	**(809,683)**	**394,222,378**	**(167,512,047)**	**(9,962,145)**	**499,633**	**(176,974,559)**	**217,247,819**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable									
		Total						**(9,962,145)**			

Less: Fully Allocated Depreciation	
Transportation	(683,014)
Stores Equipment	(52,563)
Deferred Revenue	725,656
Net Depreciation	**(9,952,224)**

Table 2-13 Fixed Asset Continuity Schedule as at December 31, 2020 – MIFRS

			Cost				Accumulated Depreciation				
CCA Class	OEB	Description	Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
	1609	Capital Contributions Paid	-	-	-	-	-	-	-	-	-
12	1611	Computer Software (Formally known as Account 1925)	7,930,523	2,049,750	-	9,980,273	(7,255,368)	(666,244)	-	(7,921,613)	2,058,661
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	1,884,075	-	-	1,884,075	(520,087)	(188,408)	-	(708,495)	1,175,581
CEC	1612	Land Rights (Formally known as Account 1906)	1,124,311	85,233	-	1,209,544	-	-	-	-	1,209,544
N/A	1805	Land	2,300,541	-	-	2,300,541	-	-	-	-	2,300,541
47	1808	Buildings - MS	278,998	-	-	278,998	(174,435)	(5,345)	-	(179,780)	99,218
47	1808	Buildings - TS	4,808,728	15,786	-	4,824,514	(1,356,536)	(77,168)	-	(1,433,705)	3,390,810
47	1808	Buildings & Fixtures - Service Centre	20,511,527	-	-	20,511,527	(3,217,030)	(403,647)	-	(3,620,677)	16,890,850
47	1808	Service Centre - Parking Lot & Fence	816,364	-	-	816,364	(249,975)	(34,377)	-	(284,352)	532,012
47	1808	Service Centre - HVAC	4,273,493	-	-	4,273,493	(2,216,619)	(316,220)	-	(2,532,839)	1,740,655
47	1808	Service Centre - Roof	613,985	-	-	613,985	(246,590)	(33,345)	-	(279,935)	334,050
47	1808	Service Centre - Automation	50,290	-	-	50,290	(24,765)	(3,481)	-	(28,246)	22,044
47	1808	Operation Centre - Workshop	61,364	-	-	61,364	(57,091)	(150)	-	(57,241)	4,123
13	1810	Leasehold Improvements	-	-	-	-	-	-	-	-	-
47	1815	Transformer Station Equipment >50 kV	15,273,674	1,210,581	-	16,484,255	(11,445,841)	(476,269)	-	(11,922,110)	4,562,144
47	1815	TSE Auxiliary equipment	2,632,161	-	-	2,632,161	(724,946)	(91,421)	-	(816,367)	1,815,794
47	1815	TSE - P&C equipment	4,049,798	-	-	4,049,798	(2,034,318)	(300,711)	-	(2,335,029)	1,714,770
47	1815	TSE - Power transformer	12,425,189	-	-	12,425,189	(3,439,045)	(245,883)	-	(3,684,928)	8,740,261
47	1820	Distribution Station Equipment <50 kV	5,161,314	126,530	-	5,287,844	(3,231,496)	(77,368)	-	(3,308,864)	1,978,980
47	1825	Storage Battery Equipment	-	-	-	-	-	-	-	-	-
47	1830	Poles, Towers & Fixtures	88,312,795	4,019,071	-	92,331,866	(31,842,717)	(1,677,287)	-	(33,520,004)	58,811,861
47	1835	Overhead Conductors & Devices	46,079,167	2,100,400	-	48,179,567	(14,329,557)	(904,376)	-	(15,233,933)	32,945,634
47	1835	OH Manual line switches	1,637,997	-	-	1,637,997	(246,695)	(54,600)	-	(301,294)	1,336,703
47	1835	OH SCADA control equipment	2,783,596	-	-	2,783,596	(865,458)	(203,718)	-	(1,069,176)	1,714,420
47	1840	Underground Conduit	26,327,848	1,115,695	-	27,443,543	(9,866,291)	(426,042)	-	(10,292,332)	17,151,210
47	1845	Underground Conductors & Devices	60,522,169	2,122,029	-	62,644,198	(25,182,573)	(1,428,724)	-	(26,611,297)	36,032,901
47	1850	Line Transformers - Overhead	35,600,369	2,182,109	-	37,782,477	(16,782,734)	(590,537)	-	(17,373,271)	20,409,206
47	1850	Line Transformers - Underground	33,072,236	2,767,347	-	35,839,583	(12,283,452)	(925,276)	-	(13,208,728)	22,630,855
47	1855	Services - Overhead	10,977,575	489,596	-	11,467,171	(5,743,414)	(168,781)	-	(5,912,196)	5,554,975
47	1855	Services - Underground	19,727,776	797,618	-	20,525,394	(8,662,580)	(299,266)	-	(8,961,847)	11,563,547
47	1860	Meters - Bidirectional	93,991	-	-	93,991	(15,158)	(3,760)	-	(18,917)	75,073
47	1860	Meters - Commercial	2,859,089	-	-	2,859,089	(2,159,366)	(128,182)	-	(2,287,548)	571,541
47	1860	Meters - Residential	2,235,949	334,193	-	2,570,142	(618,397)	(161,511)	-	(779,909)	1,790,233
47	1860	Meters C& I	2,487,686	379,793	-	2,867,480	(642,527)	(191,205)	-	(833,732)	2,033,747
47	1860	Meters (Smart Meters)	7,709,608	-	-	7,709,608	(5,267,933)	(536,249)	-	(5,804,181)	1,905,427
47	1860	Meters (Wholesale)	1,044,101	46,944	-	1,091,045	(614,204)	(45,368)	-	(659,572)	431,473
N/A	1905	Land	-	-	-	-	-	-	-	-	-
47	1908	Buildings & Fixtures	-	-	-	-	-	-	-	-	-

1

			Cost				Accumulated Depreciation				
CCA Class	**OEB**	**Description**	**Opening Balance**	**Additions**	**Disposals**	**Closing Balance**	**Opening Balance**	**Additions**	**Disposals**	**Closing Balance**	**Net Book Value**
13	1910	Leasehold Improvements	-	-	-	-	-	-	-	-	-
8	1915	Office Furniture & Equipment (10 years)	1,604,240	155,066	-	1,759,306	(1,433,359)	(120,485)	-	(1,553,845)	205,461
8	1915	Office Furniture & Equipment (5 years)	114,282	-	-	114,282	(53,553)	(20,855)	-	(74,408)	39,874
10	1920	Computer Equipment - Hardware	-	-	-	-	-	-	-	-	-
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	-	-	-	-	-	-	-	-	-
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	4,894,631	280,053	-	5,174,684	(4,506,750)	(195,712)	-	(4,702,462)	472,222
10	1930	Transportation Equipment - car	37,162	-	-	37,162	(37,162)	-	-	(37,162)	-
10	1930	Transportation Equipment - Other - trailers etc	888,171	23,644	-	911,815	(517,635)	(47,827)	-	(565,463)	346,352
10	1930	Transportation Equipment - small trucks	1,745,055	118,221	-	1,863,275	(1,461,620)	(67,240)	-	(1,528,860)	334,415
10	1930	Transportation Equipment - workplatform	6,643,811	331,018	-	6,974,828	(3,844,434)	(485,378)	-	(4,329,813)	2,645,016
10	1930	Transportation Equipment - Hybrid system	-	-	-	-	-	-	-	-	-
8	1935	Stores Equipment	697,911	-	-	697,911	(554,056)	(52,293)	-	(606,349)	91,562
8	1940	Tools, Shop & Garage Equipment	354,449	17,500	-	371,949	(321,883)	(9,131)	-	(331,013)	40,936
8	1940	Truck tools	1,334,921	17,500	-	1,352,421	(1,229,713)	(45,260)	-	(1,274,973)	77,448
8	1945	Measurement & Testing Equipment	1,038,278	-	-	1,038,278	(959,077)	(20,324)	-	(979,401)	58,877
8	1950	Power Operated Equipment	-	-	-	-	-	-	-	-	-
8	1955	Communications Equipment - phones	236,172	-	-	236,172	(52,853)	(23,617)	-	(76,470)	159,702
8	1955	Communications Equipment - Radio wireless	222,164	-	-	222,164	(195,718)	(6,800)	-	(202,517)	19,647
8	1955	Communications Equipment - Radio	177,491	-	-	177,491	(166,885)	(6,952)	-	(173,838)	3,654
8	1955	Communication Equipment (Smart Meters)	-	-	-	-	-	-	-	-	-
8	1960	Miscellaneous Equipment	2,715,403	194,100	-	2,909,503	(2,527,365)	(120,720)	-	(2,648,085)	261,418
47	1970	Load Management Controls Customer Premises	-	-	-	-	-	-	-	-	-
47	1975	Load Management Controls Utility Premises	-	-	-	-	-	-	-	-	-
47	1980	System Supervisor Equipment	6,218,233	230,764	-	6,448,997	(3,869,469)	(288,843)	-	(4,158,312)	2,290,685
47	1985	Miscellaneous Fixed Assets	-	-	-	-	-	-	-	-	-
47	1990	Other Tangible Property	-	-	-	-	-	-	-	-	-
47	1995	Contributions & Grants	(31,831,420)	-	-	(31,831,420)	13,399,915	734,912	-	14,134,827	(17,696,593)
47	2440	Deferred Revenue - 1808	(24,595)	-	-	(24,595)	6,147	1,228	-	7,375	(17,220)
47	2440	Deferred Revenue - 1830	(2,247,348)	(254,391)	-	(2,501,739)	182,689	55,594	-	238,283	(2,263,456)
47	2440	Deferred Revenue - 1835	(1,278,033)	(143,829)	-	(1,421,862)	103,770	31,597	-	135,367	(1,286,495)
47	2440	Deferred Revenue - 1840	(3,849,172)	(123,283)	-	(3,972,454)	296,056	79,449	-	375,505	(3,596,949)
47	2440	Deferred Revenue - 1845	(9,377,173)	(316,357)	-	(9,693,530)	1,022,943	276,958	-	1,299,901	(8,393,629)
47	2440	Deferred Revenue - 1850	(9,413,578)	(830,216)	-	(10,243,794)	890,018	269,574	-	1,159,592	(9,084,203)
47	2440	Deferred Revenue - 1855	(2,226,757)	(359,280)	-	(2,586,037)	150,848	52,776	-	203,624	(2,382,413)
47	2440	Deferred Revenue - 1860	(120,207)	(38,449)	-	(158,656)	21,784	10,577	-	32,361	(126,295)
	2005	Property Under Finance Lease	-	-	-	-	-			-	-
						-				-	-
		Sub-Total	**394,222,378**	**19,144,734**	**-**	**413,367,112**	**(176,974,559)**	**(10,663,695)**	**-**	**(187,638,254)**	**225,728,858**
		Less Socialized Renewable Energy Generation Investments (input as negative)				-				-	-
		Less Other Non Rate-Regulated Utility Assets (input as negative)				-				-	-
		Total PP&E	**394,222,378**	**19,144,734**	**-**	**413,367,112**	**(176,974,559)**	**(10,663,695)**	**-**	**(187,638,254)**	**225,728,858**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable									
		Total						**(10,663,695)**			

Less: Fully Allocated Depreciation	
Transportation	(654,837)
Stores Equipment	(52,293)
Deferred Revenue	777,753
Net Depreciation	**(10,734,319)**

Table 2-14 Fixed Asset Continuity Schedule as at December 31, 2021 – MIFRS

			Cost				Accumulated Depreciation				
CCA Class	OEB	Description	Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
	1609	Capital Contributions Paid	-	-	-	-	-	-	-	-	-
12	1611	Computer Software (Formally known as Account 1925)	9,980,273	565,477	-	10,545,751	(7,921,613)	(741,663)	-	(8,663,276)	1,882,475
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	1,884,075	-	-	1,884,075	(708,495)	(188,408)	-	(896,902)	987,173
CEC	1612	Land Rights (Formally known as Account 1906)	1,209,544	85,149	-	1,294,693	-	-	-	-	1,294,693
N/A	1805	Land	2,300,541	-	-	2,300,541	-	-	-	-	2,300,541
47	1808	Buildings - MS	278,998	9,059	-	288,057	(179,780)	(5,526)	-	(185,306)	102,751
47	1808	Buildings - TS	4,824,514	310,046	-	5,134,560	(1,433,705)	(82,336)	-	(1,516,040)	3,618,520
47	1808	Buildings & Fixtures - Service Centre	20,511,527	-	-	20,511,527	(3,620,677)	(403,647)	-	(4,024,325)	16,487,202
47	1808	Service Centre - Parking Lot & Fence	816,364	-	-	816,364	(284,352)	(34,377)	-	(318,729)	497,634
47	1808	Service Centre - HVAC	4,273,493	-	-	4,273,493	(2,532,839)	(316,220)	-	(2,849,059)	1,424,434
47	1808	Service Centre - Roof	613,985	-	-	613,985	(279,935)	(33,345)	-	(313,280)	300,705
47	1808	Service Centre - Automation	50,290	-	-	50,290	(28,246)	(3,481)	-	(31,727)	18,563
47	1808	Operation Centre - Workshop	61,364	-	-	61,364	(57,241)	(150)	-	(57,391)	3,973
13	1810	Leasehold Improvements	-	-	-	-	-	-	-	-	-
47	1815	Transformer Station Equipment >50 kV	16,484,255	707,668	-	17,191,923	(11,922,110)	(487,092)	-	(12,409,203)	4,782,720
47	1815	TSE Auxiliary equipment	2,632,161	-	-	2,632,161	(816,367)	(91,421)	-	(907,789)	1,724,372
47	1815	TSE - P&C equipment	4,049,798	-	-	4,049,798	(2,335,029)	(285,613)	-	(2,620,642)	1,429,157
47	1815	TSE - Power transformer	12,425,189	-	-	12,425,189	(3,684,928)	(245,883)	-	(3,930,811)	8,494,378
47	1820	Distribution Station Equipment <50 kV	5,287,844	97,391	-	5,385,235	(3,308,864)	(79,291)	-	(3,388,154)	1,997,080
47	1825	Storage Battery Equipment	-	-	-	-	-	-	-	-	-
47	1830	Poles, Towers & Fixtures	92,331,866	3,744,396	-	96,076,261	(33,520,004)	(1,760,496)	-	(35,280,501)	60,795,761
47	1835	Overhead Conductors & Devices	48,179,567	1,930,081	-	50,109,648	(15,233,933)	(947,266)	-	(16,181,199)	33,928,448
47	1835	OH Manual line switches	1,637,997	-	-	1,637,997	(301,294)	(54,600)	-	(355,894)	1,282,104
47	1835	OH SCADA control equipment	2,783,596	-	-	2,783,596	(1,069,176)	(203,718)	-	(1,272,894)	1,510,702
47	1840	Underground Conduit	27,443,543	1,117,242	-	28,560,785	(10,292,332)	(448,387)	-	(10,740,719)	17,820,066
47	1845	Underground Conductors & Devices	62,644,198	2,215,447	-	64,859,645	(26,611,297)	(1,492,022)	-	(28,103,319)	36,756,326
47	1850	Line Transformers - Overhead	37,782,477	2,066,358	-	39,848,836	(17,373,271)	(636,457)	-	(18,009,728)	21,839,108
47	1850	Line Transformers - Underground	35,839,583	2,625,718	-	38,465,301	(13,208,728)	(1,000,297)	-	(14,209,024)	24,256,277
47	1855	Services - Overhead	11,467,171	386,717	-	11,853,888	(5,912,196)	(177,375)	-	(6,089,571)	5,764,317
47	1855	Services - Underground	20,525,394	728,300	-	21,253,694	(8,961,847)	(313,832)	-	(9,275,679)	11,978,015
47	1860	Meters - Bidirectional	93,991	-	-	93,991	(18,917)	(3,760)	-	(22,677)	71,314
47	1860	Meters - Commercial	2,859,089	-	-	2,859,089	(2,287,548)	(125,850)	-	(2,413,398)	445,691
47	1860	Meters - Residential	2,570,142	330,339	-	2,900,481	(779,909)	(183,534)	-	(963,443)	1,937,038
47	1860	Meters C& I	2,867,480	334,260	-	3,201,740	(833,732)	(213,489)	-	(1,047,222)	2,154,518
47	1860	Meters (Smart Meters)	7,709,608	-	-	7,709,608	(5,804,181)	(536,249)	-	(6,340,430)	1,369,178
47	1860	Meters (Wholesale)	1,091,045	6,089	-	1,097,134	(659,572)	(40,758)	-	(700,329)	396,805
N/A	1905	Land	-	-	-	-	-	-	-	-	-
47	1908	Buildings & Fixtures	-	-	-	-	-	-	-	-	-

			Cost				Accumulated Depreciation				
CCA Class	**OEB**	**Description**	**Opening Balance**	**Additions**	**Disposals**	**Closing Balance**	**Opening Balance**	**Additions**	**Disposals**	**Closing Balance**	**Net Book Value**
13	1910	Leasehold Improvements	-	-	-	-	-	-	-	-	-
8	1915	Office Furniture & Equipment (10 years)	1,759,306	131,500	-	1,890,806	(1,553,845)	(66,180)	-	(1,620,025)	270,781
8	1915	Office Furniture & Equipment (5 years)	114,282	-	-	114,282	(74,408)	(19,353)	-	(93,762)	20,520
10	1920	Computer Equipment - Hardware	-	-	-	-	-	-	-	-	-
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	-	-	-	-	-	-	-	-	-
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	5,174,684	224,935	-	5,399,619	(4,702,462)	(211,298)	-	(4,913,760)	485,859
10	1930	Transportation Equipment - car	37,162	-	-	37,162	(37,162)	-	-	(37,162)	-
10	1930	Transportation Equipment - Other - trailers etc	911,815	54,912	-	966,726	(565,463)	(50,151)	-	(615,614)	351,112
10	1930	Transportation Equipment - small trucks	1,863,275	274,558	-	2,137,833	(1,528,860)	(95,922)	-	(1,624,782)	513,051
10	1930	Transportation Equipment - workplatform	6,974,828	768,762	-	7,743,590	(4,329,813)	(498,822)	-	(4,828,635)	2,914,956
10	1930	Transportation Equipment - Hybrid system	-	-	-	-	-	-	-	-	-
8	1935	Stores Equipment	697,911	130,000	-	827,911	(606,349)	(31,720)	-	(638,069)	189,842
8	1940	Tools, Shop & Garage Equipment	371,949	19,000	-	390,949	(331,013)	(10,203)	-	(341,217)	49,733
8	1940	Truck tools	1,352,421	19,000	-	1,371,421	(1,274,973)	(37,669)	-	(1,312,642)	58,779
8	1945	Measurement & Testing Equipment	1,038,278	-	-	1,038,278	(979,401)	(15,154)	-	(994,555)	43,723
8	1950	Power Operated Equipment	-	-	-	-	-	-	-	-	-
8	1955	Communications Equipment - phones	236,172	-	-	236,172	(76,470)	(23,617)	-	(100,087)	136,084
8	1955	Communications Equipment - Radio wireless	222,164	-	-	222,164	(202,517)	(6,549)	-	(209,066)	13,098
8	1955	Communications Equipment - Radio	177,491	-	-	177,491	(173,838)	(2,387)	-	(176,225)	1,267
8	1955	Communication Equipment (Smart Meters)	-	-	-	-	-	-	-	-	-
8	1960	Miscellaneous Equipment	2,909,503	119,200	-	3,028,703	(2,648,085)	(52,396)	-	(2,700,481)	328,222
47	1970	Load Management Controls Customer Premises	-	-	-	-	-	-	-	-	-
47	1975	Load Management Controls Utility Premises	-	-	-	-	-	-	-	-	-
47	1980	System Supervisor Equipment	6,448,997	274,317	-	6,723,314	(4,158,312)	(301,323)	-	(4,459,635)	2,263,679
47	1985	Miscellaneous Fixed Assets	-	-	-	-	-	-	-	-	-
47	1990	Other Tangible Property	-	-	-	-	-	-	-	-	-
47	1995	Contributions & Grants	(31,831,420)	-	-	(31,831,420)	14,134,827	734,273	-	14,869,100	(16,962,320)
47	2440	Deferred Revenue - 1808	(24,595)	-	-	(24,595)	7,375	1,228	-	8,603	(15,992)
47	2440	Deferred Revenue - 1830	(2,501,739)	(179,247)	-	(2,680,986)	238,283	59,577	-	297,861	(2,383,126)
47	2440	Deferred Revenue - 1835	(1,421,862)	(101,344)	-	(1,523,206)	135,367	33,849	-	169,216	(1,353,990)
47	2440	Deferred Revenue - 1840	(3,972,454)	(278,040)	-	(4,250,494)	375,505	85,010	-	460,515	(3,789,979)
47	2440	Deferred Revenue - 1845	(9,693,530)	(690,984)	-	(10,384,514)	1,299,901	296,700	-	1,596,601	(8,787,913)
47	2440	Deferred Revenue - 1850	(10,243,794)	(994,187)	-	(11,237,982)	1,159,592	295,736	-	1,455,328	(9,782,654)
47	2440	Deferred Revenue - 1855	(2,586,037)	(357,363)	-	(2,943,400)	203,624	60,069	-	263,694	(2,679,707)
47	2440	Deferred Revenue - 1860	(158,656)	(41,229)	-	(199,886)	32,361	13,381	-	45,742	(154,144)
	2005	Property Under Finance Lease	-	-	-	-	-	-	-	-	-
						-				-	-
		Sub-Total	**413,367,112**	**16,633,526**	**-**	**430,000,639**	**(187,638,254)**	**(10,979,464)**	**-**	**(198,617,718)**	**231,382,921**
		Less Socialized Renewable Energy Generation Investments (input as negative)				-				-	-
		Less Other Non Rate-Regulated Utility Assets (input as negative)				-				-	-
		Total PP&E	**413,367,112**	**16,633,526**	**-**	**430,000,639**	**(187,638,254)**	**(10,979,464)**	**-**	**(198,617,718)**	**231,382,921**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable									
		Total						**(10,979,464)**			

Less: Fully Allocated Depreciation	
Transportation	(692,767)
Stores Equipment	(31,720)
Deferred Revenue	845,551
Net Depreciation	**(11,100,527)**

Breakdown by Function

Table 2-15 below categorizes WNH's assets into four categories; Transmission Assets, Distribution Assets, General Plant and Contributions and Grants. In accordance with the Uniform System of Accounts ("USoA"), WNH has included Gross Assets as follows:

- Transmission Assets are included in OEB Accounts 1808 (except for the distribution service centre),1815 and 1820. They consist of the buildings, equipment of the transmission assets of WNH. WNH owns and operates four (4) transformer stations and six (6) distribution stations located throughout its service territory. One (1), Elmira Transformer Station (ELTS), is owned and operated by HONI and is embedded inside of WNH's service territory. WNH owns 2 feeders and portions of the third feeder emanating from the ELTS. Approximately 80% of the ELTS load is supplied to WNH customers with the remaining load supplied from HONI customers in nearby Wellington County. WNH's transmission assets are deemed as distribution assets.

- Distribution Plant Asset Accounts include USoA 1808 (portion relating to the service centre), 1830 to 1860 and USoA 1612 - this account includes assets such as the service centre building, poles, wires, transformers and meters.

- General Plant Asset Accounts include USoA 1915 to 1980 and USoA 1611 - this account includes assets such as office furniture, computer software and hardware, transportation equipment, and tools.

- Contributions and Grants includes USoA accounts 1995 and 2440 – this account includes all contributions in aid of capital that WNH has received or forecasted to be received as per the Distribution System Code ("DSC").

This table excludes Electric Plant Held for Future Use – USoA 2040 and Work in Progress (WIP) – USoA 2055. The Electric Plant Held for Future Use is property that was purchased for future transmission station sites. This account is not included in rate base. The WIP account includes all costs related to assets that are not considered in service as of December 31st of the applicable fiscal year. Costs are transferred out of WIP and into the appropriate category above once designated in-service in the field. These costs are also not included in rate base.

WNH has not applied for any ACM or ICM adjustments as part of a previous IRM application.

Table 2-15 summarizes the categories by year. All opening and closing balances agree to required filing Appendix 2-BA which is filed in live Excel format (Waterloo_Appl_2021_Filing_Req_Chap2_Appendices_2021_COS_20200630) and shown in Attachment 2-1.

Table 2-15 – Gross Assets by Category

Gross Assets

Description	2016 Board Approved	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
Reporting Basis	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS
Transmission Assets	43,840,960	42,784,883	43,100,544	44,069,443	44,629,862	45,982,759	47,106,923
Distribution Assets	316,290,267	322,156,769	338,657,177	354,594,083	371,223,826	387,663,854	403,233,950
General Plant	34,903,523	34,030,994	36,121,161	37,085,747	38,736,973	42,154,588	44,736,249
Contributions and Grants	(46,085,912)	(50,709,912)	(55,288,414)	(58,257,343)	(60,368,283)	(62,434,089)	(65,076,483)
Total Excluding WIP	**348,948,838**	**348,262,734**	**362,590,468**	**377,491,930**	**394,222,378**	**413,367,112**	**430,000,639**

Accumulated Depreciation

Description	2016 Board Approved	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
Reporting Basis	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS
Transmission Assets	19,673,472	18,873,473	19,873,447	21,152,213	22,406,618	23,680,783	24,957,944
Distribution Assets	117,360,733	118,080,257	125,311,857	133,019,498	141,135,123	149,671,226	158,600,538
General Plant	25,488,713	25,417,703	27,116,190	27,953,157	29,506,988	31,873,078	34,225,895
Contributions and Grants	(11,718,904)	(11,865,343)	(13,202,563)	(14,612,820)	(16,074,169)	(17,586,834)	(19,166,659)
Total Excluding WIP	**150,804,014**	**150,506,090**	**159,098,931**	**167,512,048**	**176,974,560**	**187,638,253**	**198,617,718**

Net Fixed Assets

Description	2016 Board Approved	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
Reporting Basis	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS
Tranmission Assets	24,167,488	23,911,410	23,227,097	22,917,230	22,223,244	22,301,976	22,148,979
Distribution Assets	198,929,534	204,076,512	213,345,320	221,574,585	230,088,703	237,992,628	244,633,412
General Plant	9,414,810	8,613,291	9,004,971	9,132,590	9,229,985	10,281,510	10,510,354
Contributions and Grants	(34,367,008)	(38,844,569)	(42,085,851)	(43,644,523)	(44,294,114)	(44,847,255)	(45,909,824)
Total Excluding WIP	**198,144,824**	**197,756,644**	**203,491,537**	**209,979,882**	**217,247,818**	**225,728,859**	**231,382,921**

Detailed Breakdown by Major Plant Account

Table 2-16 below provides a detailed breakdown by Major Plant account for each functionalized plant item. Each plant item is accompanied by a description in accordance with the Board's USoA, including the 2021 Test Year. WNH has also included a breakdown of Accumulated Amortization in the same format in Table 2-17 and a breakdown of Net Fixed assets in Table 2-18.

1
Table 2-16 – Detailed Gross Assets

Description	2016 Board Approved	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
Reporting Basis	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS
Transmission Assets							
1808 - Building - MS/TS	4,930,000	4,955,361	4,924,608	5,034,512	5,087,726	5,103,512	5,422,617
1815 - Transformer Station Equipment >50 kV	33,219,290	32,705,987	33,014,622	33,873,617	34,380,822	35,591,403	36,299,071
1820 - Distribution Station Equipment <50 kV	5,691,670	5,123,535	5,161,314	5,161,314	5,161,314	5,287,844	5,385,235
Subtotal Transmission Assets	43,840,960	42,784,883	43,100,544	44,069,443	44,629,862	45,982,759	47,106,923
Distribution Assets							
1805 - Land	2,306,589	2,308,591	2,300,541	2,300,541	2,300,541	2,300,541	2,300,541
1806/1612 - Land Rights	740,439	897,918	982,250	1,059,625	1,124,311	1,209,544	1,294,693
1808 - Buildings	25,655,695	26,101,807	26,288,624	26,319,019	26,327,023	26,327,023	26,327,023
1830 - Poles, Towers & Fixtures	72,032,011	74,856,216	79,558,421	84,294,693	88,312,795	92,331,866	96,076,261
1835 - Overhead Conductors & Devices	41,305,544	41,862,980	44,874,408	47,658,199	50,500,760	52,601,160	54,531,241
1840 - Underground Conduit	21,131,729	22,453,063	23,409,914	24,850,240	26,327,848	27,443,543	28,560,785
1845 - Underground Conductors & Devices	49,728,827	52,988,372	55,522,228	58,141,398	60,522,169	62,644,198	64,859,645
1850 - Line Transformers	61,613,848	59,431,568	62,526,072	65,224,372	68,672,604	73,622,060	78,314,137
1855 - Services (Overhead & Underground)	27,454,086	27,250,200	28,471,071	29,499,969	30,705,351	31,992,565	33,107,582
1860 - Meters	14,321,499	6,296,446	7,014,040	7,536,419	8,720,816	9,481,746	10,152,434
1860 - Meters (Smart Meters)		7,709,608	7,709,608	7,709,608	7,709,608	7,709,608	7,709,608
Subtotal Distribution Assets	316,290,267	322,156,769	338,657,177	354,594,083	371,223,826	387,663,854	403,233,950
General Plant							
1920 - Computer Hardware	4,343,439	4,343,126	4,465,644	4,667,790	4,894,631	5,174,684	5,399,619
1925/1611 - Computer Software	7,695,475	6,837,432	8,598,030	9,578,601	9,814,599	11,864,349	12,429,826
1915 - Office Furniture & Equipment	1,584,130	1,601,542	1,626,810	1,685,037	1,718,522	1,873,588	2,005,088
1930 - Transportation Equipment	9,429,508	9,406,406	9,494,548	8,627,348	9,314,198	9,787,080	10,885,312
1935 - Stores Equipment	542,506	655,921	656,921	697,911	697,911	697,911	827,911
1940 - Tools, Shop & Garage Equipment	1,524,361	1,504,996	1,537,566	1,624,121	1,689,371	1,724,371	1,762,371
1945 - Measurement & Testing Equipment	956,204	938,092	967,137	1,004,958	1,038,278	1,038,278	1,038,278
1955 - Communications Equipment	944,263	983,246	983,246	983,246	635,827	635,827	635,827
1960 - Miscellaneous Equipment	2,653,400	2,645,677	2,664,237	2,702,981	2,715,403	2,909,503	3,028,703
1980 - System Supervisor Equipment	5,230,237	5,114,556	5,127,022	5,513,754	6,218,233	6,448,997	6,723,314
Subtotal General Plant	34,903,523	34,030,994	36,121,161	37,085,747	38,736,973	42,154,588	44,736,249
Contribution and Grants							
1995 - Contributions & Grants	(33,424,664)	(31,831,420)	(31,831,420)	(31,831,420)	(31,831,420)	(31,831,420)	(31,831,420)
2440 - Deferred Revenue	(12,661,248)	(18,878,492)	(23,456,994)	(26,425,923)	(28,536,863)	(30,602,669)	(33,245,063)
Subtotal Contribution and Grants	(46,085,912)	(50,709,912)	(55,288,414)	(58,257,343)	(60,368,283)	(62,434,089)	(65,076,483)
Gross Assets for Rate Base	**348,948,838**	**348,262,734**	**362,590,468**	**377,491,930**	**394,222,378**	**413,367,112**	**430,000,639**

1

Table 2-17 – Detailed Accumulated Depreciation

Description	2016 Board Approved	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
Reporting Basis	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS
Transmission Assets							
1808 - Building - MS/DS/TS	1,292,000	1,321,465	1,367,359	1,448,721	1,530,971	1,613,484	1,701,346
1815 - Transformer Station Equipment >50 kV	14,533,640	14,306,560	15,456,296	16,561,923	17,644,151	18,758,435	19,868,444
1820 - Distribution Station Equipment <50 kV	3,847,832	3,245,448	3,049,792	3,141,569	3,231,496	3,308,864	3,388,154
Subtotal Transmission Assets	19,673,472	18,873,473	19,873,447	21,152,213	22,406,618	23,680,783	24,957,944
Distribution Assets							
1805 - Land	-	-	-	-	-	-	-
1806/1612 - Land Rights	-	-	-	-	-	-	-
1808 - Buildings	3,486,711	3,640,589	4,430,159	5,220,847	6,012,068	6,803,290	7,594,511
1830 - Poles, Towers & Fixtures	27,230,264	27,390,516	28,756,058	30,254,742	31,842,717	33,520,004	35,280,501
1835 - Overhead Conductors & Devices	12,271,425	12,313,983	13,305,802	14,343,837	15,441,709	16,604,403	17,809,987
1840 - Underground Conduit	8,705,346	8,743,031	9,088,394	9,462,563	9,866,291	10,292,332	10,740,719
1845 - Underground Conductors & Devices	21,229,315	21,222,460	22,477,496	23,801,294	25,182,573	26,611,297	28,103,319
1850 - Line Transformers	25,259,987	25,238,621	26,385,728	27,677,930	29,066,185	30,581,999	32,218,752
1855 - Services (Overhead & Underground)	13,144,063	13,152,965	13,548,234	13,964,779	14,405,995	14,874,042	15,365,250
1860 - Meters	6,033,622	2,718,905	3,124,551	3,561,822	4,049,652	4,579,678	5,147,069
1860 - Meters (Smart Meters)		3,659,187	4,195,435	4,731,684	5,267,933	5,804,181	6,340,430
Subtotal Distribution Assets	117,360,733	118,080,257	125,311,857	133,019,498	141,135,123	149,671,226	158,600,538
General Plant							
1920 - Computer Hardware	4,049,497	4,055,923	4,185,975	4,338,886	4,506,750	4,702,462	4,913,760
1925/1611 - Computer Software	6,270,797	6,151,432	6,646,262	7,223,413	7,775,455	8,630,107	9,560,178
1915 - Office Furniture & Equipment	1,123,536	1,126,400	1,238,564	1,360,586	1,486,913	1,628,253	1,713,787
1930 - Transportation Equipment	5,756,340	5,759,840	5,989,131	5,285,303	5,860,851	6,461,297	7,106,193
1935 - Stores Equipment	381,573	393,077	451,460	501,493	554,056	606,349	638,069
1940 - Tools, Shop & Garage Equipment	1,249,290	1,255,874	1,364,318	1,475,569	1,551,596	1,605,987	1,653,859
1945 - Measurement & Testing Equipment	867,642	865,506	908,299	938,078	959,077	979,401	994,555
1955 - Communications Equipment	700,203	703,962	775,033	845,217	415,456	452,825	485,378
1960 - Miscellaneous Equipment	1,956,317	1,959,320	2,198,758	2,391,432	2,527,365	2,648,085	2,700,481
1980 - System Supervisor Equipment	3,133,518	3,146,369	3,358,390	3,593,180	3,869,469	4,158,312	4,459,635
Subtotal General Plant	25,488,713	25,417,703	27,116,190	27,953,157	29,506,988	31,873,078	34,225,895
Contribution and Grants							
1995 - Contributions & Grants	(11,306,403)	(11,188,434)	(11,926,967)	(12,664,222)	(13,399,915)	(14,134,827)	(14,869,100)
2440 - Deferred Revenue	(412,501)	(676,909)	(1,275,596)	(1,948,598)	(2,674,254)	(3,452,007)	(4,297,559)
Subtotal Contribution and Grants	(11,718,904)	(11,865,343)	(13,202,563)	(14,612,820)	(16,074,169)	(17,586,834)	(19,166,659)
Accumulated Depreciation for Rate Base	**150,804,014**	**150,506,090**	**159,098,931**	**167,512,048**	**176,974,560**	**187,638,253**	**198,617,718**

Table 2-18 – Detailed Net Fixed Assets

Description	2016 Board Approved	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
Reporting Basis	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS
Transmission Assets							
1808 - Building - MS/DS/TS	3,638,000	3,633,896	3,557,249	3,585,791	3,556,755	3,490,028	3,721,271
1815 - Transformer Station Equipment >50 kV	18,685,650	18,399,427	17,558,326	17,311,694	16,736,671	16,832,968	16,430,627
1820 - Distribution Station Equipment <50 kV	1,843,838	1,878,087	2,111,522	2,019,745	1,929,818	1,978,980	1,997,081
Subtotal Transmission Assets	24,167,488	23,911,410	23,227,097	22,917,230	22,223,244	22,301,976	22,148,979
Distribution Assets							
1805 - Land	2,306,589	2,308,591	2,300,541	2,300,541	2,300,541	2,300,541	2,300,541
1806/1612 - Land Rights	740,439	897,918	982,250	1,059,625	1,124,311	1,209,544	1,294,693
1808 - Buildings	22,168,984	22,461,218	21,858,465	21,098,172	20,314,955	19,523,733	18,732,512
1830 - Poles, Towers & Fixtures	44,801,747	47,465,700	50,802,363	54,039,951	56,470,078	58,811,862	60,795,760
1835 - Overhead Conductors & Devices	29,034,119	29,548,997	31,568,606	33,314,362	35,059,051	35,996,757	36,721,254
1840 - Underground Conduit	12,426,383	13,710,032	14,321,520	15,387,677	16,461,557	17,151,211	17,820,066
1845 - Underground Conductors & Devices	28,499,512	31,765,912	33,044,732	34,340,104	35,339,596	36,032,901	36,756,326
1850 - Line Transformers	36,353,861	34,192,947	36,140,344	37,546,442	39,606,419	43,040,061	46,095,385
1855 - Services (Overhead & Underground)	14,310,023	14,097,235	14,922,837	15,535,190	16,299,356	17,118,523	17,742,332
1860 - Meters	8,287,877	3,577,541	3,889,489	3,974,597	4,671,164	4,902,068	5,005,365
1860 - Meters (Smart Meters)	-	4,050,421	3,514,173	2,977,924	2,441,675	1,905,427	1,369,178
Subtotal Distribution Assets	198,929,534	204,076,512	213,345,320	221,574,585	230,088,703	237,992,628	244,633,412
General Plant							
1920 - Computer Hardware	293,942	287,203	279,669	328,904	387,881	472,222	485,859
1925/1611 - Computer Software	1,424,678	686,000	1,951,768	2,355,188	2,039,144	3,234,242	2,869,648
1915 - Office Furniture & Equipment	460,594	475,142	388,246	324,451	231,609	245,335	291,301
1930 - Transportation Equipment	3,673,168	3,646,566	3,505,417	3,342,045	3,453,347	3,325,783	3,779,119
1935 - Stores Equipment	160,933	262,844	205,461	196,418	143,855	91,562	189,842
1940 - Tools, Shop & Garage Equipment	275,071	249,122	173,248	148,552	137,775	118,384	108,512
1945 - Measurement & Testing Equipment	88,562	72,586	58,838	66,880	79,201	58,877	43,723
1955 - Communications Equipment	244,060	279,284	208,213	138,029	220,371	183,002	150,449
1960 - Miscellaneous Equipment	697,083	686,357	465,479	311,549	188,038	261,418	328,222
1980 - System Supervisor Equipment	2,096,719	1,968,187	1,768,632	1,920,574	2,348,764	2,290,685	2,263,679
Subtotal General Plant	9,414,810	8,613,291	9,004,971	9,132,590	9,229,985	10,281,510	10,510,354
Contribution and Grants							
1995 - Contributions & Grants	(22,118,261)	(20,642,986)	(19,904,453)	(19,167,198)	(18,431,505)	(17,696,593)	(16,962,320)
2440 - Deferred Revenue	(12,248,747)	(18,201,583)	(22,181,398)	(24,477,325)	(25,862,609)	(27,150,662)	(28,947,504)
Subtotal Contribution and Grants	(34,367,008)	(38,844,569)	(42,085,851)	(43,644,523)	(44,294,114)	(44,847,255)	(45,909,824)
Accumulated Depreciation for Rate Base	**198,144,824**	**197,756,644**	**203,491,537**	**209,979,882**	**217,247,818**	**225,728,859**	**231,382,921**

Variance Analysis on Gross Assets

Table 2-19 below shows the gross asset variance for each asset.

Table 2-19 – 2016 – 2021 Gross Asset Variance

Description	2016 Board Approved	2016 Actual	Variance from 2016 Board Approved	2017 Actual	Variance from 2016 Actual	2018 Actual	Variance from 2017 Actual	2019 Actual	Variance from 2018 Actual	2020 Bridge	Variance from 2019 Actual	2021 Test	Variance from 2020 Forecast
Reporting Basis	**MIFRS**	**MIFRS**		**MIFRS**		**MIFRS**		**MIFRS**		**MIFRS**		**MIFRS**	
Land & Buildings													
1805 - Land	2,306,589	2,308,591	2,002	2,300,541	(8,050)	2,300,541	-	2,300,541	-	2,300,541	-	2,300,541	-
1806/1612 - Land Rights	740,439	897,918	157,479	982,250	84,332	1,059,625	77,375	1,124,311	64,686	1,209,544	85,233	1,294,693	85,149
1808 - Buildings	30,585,695	31,057,168	471,473	31,213,232	156,064	31,353,531	140,299	31,414,749	61,218	31,430,535	15,786	31,749,640	319,105
Subtotal Land & Buildings	33,632,723	34,263,677	630,954	34,496,023	232,346	34,713,697	217,674	34,839,601	125,904	34,940,620	101,019	35,344,874	404,254
Transmission & Distribution Stations													
1815 - Transformer Station Equipment >50 kV	33,219,290	32,705,987	(513,303)	33,014,622	308,635	33,873,617	858,995	34,380,822	507,205	35,591,403	1,210,581	36,299,071	707,668
1820 - Distribution Station Equipment <50 kV	5,691,670	5,123,535	(568,135)	5,161,314	37,779	5,161,314	-	5,161,314	-	5,287,844	126,530	5,385,235	97,391
Subtotal Transmission & Distribution Stations	38,910,960	37,829,522	(1,081,438)	38,175,936	346,414	39,034,931	858,995	39,542,136	507,205	40,879,247	1,337,111	41,684,306	805,059
Poles & Wires													
1830 - Poles, Towers & Fixtures	72,032,011	74,856,216	2,824,205	79,558,421	4,702,205	84,294,693	4,736,272	88,312,795	4,018,102	92,331,866	4,019,071	96,076,261	3,744,395
1835 - Overhead Conductors & Devices	41,305,544	41,862,980	557,436	44,874,408	3,011,428	47,658,199	2,783,791	50,500,760	2,842,561	52,601,160	2,100,400	54,531,241	1,930,081
1840 - Underground Conduit	21,131,729	22,453,063	1,321,334	23,409,914	956,851	24,850,240	1,440,326	26,327,848	1,477,608	27,443,543	1,115,695	28,560,785	1,117,242
1845 - Underground Conductors & Devices	49,728,827	52,988,372	3,259,545	55,522,228	2,533,856	58,141,398	2,619,170	60,522,169	2,380,771	62,644,198	2,122,029	64,859,645	2,215,447
Subtotal Poles & Wires	184,198,111	192,160,631	7,962,520	203,364,971	11,204,340	214,944,530	11,579,559	225,663,572	10,719,042	235,020,767	9,357,195	244,027,932	9,007,165
Line Transformers													
1850 - Line Transformers	61,613,848	59,431,568	(2,182,280)	62,526,072	3,094,504	65,224,372	2,698,300	68,672,604	3,448,232	73,622,060	4,949,456	78,314,137	4,692,077
Subtotal Line Transformers	61,613,848	59,431,568	(2,182,280)	62,526,072	3,094,504	65,224,372	2,698,300	68,672,604	3,448,232	73,622,060	4,949,456	78,314,137	4,692,077
Services & Meters													
1855 - Services (Overhead & Underground)	27,454,086	27,250,200	(203,886)	28,471,071	1,220,871	29,499,969	1,028,898	30,705,351	1,205,382	31,992,565	1,287,214	33,107,582	1,115,017
1860 - Meters	14,321,499	6,296,446	(8,025,053)	7,014,040	717,594	7,536,419	522,379	8,720,816	1,184,397	9,481,746	760,930	10,152,434	670,688
1860 - Meters (Smart Meters)		7,709,608	7,709,608	7,709,608	-	7,709,608	-	7,709,608	-	7,709,608	-	7,709,608	-
Subtotal Services & Meters	41,775,585	41,256,254	(519,331)	43,194,719	1,938,465	44,745,996	1,551,277	47,135,775	2,389,779	49,183,919	2,048,144	50,969,624	1,785,705
IT Assets													
1920 - Computer Hardware	4,343,439	4,343,126	(313)	4,465,644	122,518	4,667,790	202,146	4,894,631	226,841	5,174,684	280,053	5,399,619	224,935
1925/1611 - Computer Software	7,695,475	6,837,432	(858,043)	8,598,030	1,760,598	9,578,601	980,571	9,814,599	235,998	11,864,349	2,049,750	12,429,826	565,477
Subtotal IT Assets	12,038,914	11,180,558	(858,356)	13,063,674	1,883,116	14,246,391	1,182,717	14,709,230	462,839	17,039,033	2,329,803	17,829,445	790,412
Equipment													
1915 - Office Furniture & Equipment	1,584,130	1,601,542	17,412	1,626,810	25,268	1,685,037	58,227	1,718,522	33,485	1,873,588	155,066	2,005,088	131,500
1930 - Transportation Equipment	9,429,508	9,406,406	(23,102)	9,494,548	88,142	8,627,348	(867,200)	9,314,198	686,850	9,787,080	472,882	10,885,312	1,098,232
1935 - Stores Equipment	542,506	655,921	113,415	656,921	1,000	697,911	40,990	697,911	-	697,911	-	827,911	130,000
1940 - Tools, Shop & Garage Equipment	1,524,361	1,504,996	(19,365)	1,537,566	32,570	1,624,121	86,555	1,689,371	65,250	1,724,371	35,000	1,762,371	38,000
1945 - Measurement & Testing Equipment	956,204	938,092	(18,112)	967,137	29,045	1,004,958	37,821	1,038,278	33,320	1,038,278	-	1,038,278	-
1955 - Communications Equipment	944,263	983,246	38,983	983,246	-	983,246	-	635,827	(347,419)	635,827	-	635,827	-
1960 - Miscellaneous Equipment	2,653,400	2,645,677	(7,723)	2,664,237	18,560	2,702,981	38,744	2,715,403	12,422	2,909,503	194,100	3,028,703	119,200
Subtotal Equipment	17,634,372	17,735,880	101,508	17,930,465	194,585	17,325,602	(604,863)	17,809,510	483,908	18,666,558	857,048	20,183,490	1,516,932
Other Distribution Assets													
1980 - System Supervisor Equipment	5,230,237	5,114,556	(115,681)	5,127,022	12,466	5,513,754	386,732	6,218,233	704,479	6,448,997	230,764	6,723,314	274,317
1995 - Contributions & Grants	(33,424,664)	(31,831,420)	1,593,244	(31,831,420)	-	(31,831,420)	-	(31,831,420)	-	(31,831,420)	-	(31,831,420)	-
2440 - Deferred Revenue	(12,661,248)	(18,878,492)	(6,217,244)	(23,456,994)	(4,578,502)	(26,425,923)	(2,968,929)	(28,536,863)	(2,110,940)	(30,602,669)	(2,065,806)	(33,245,063)	(2,642,394)
Subtotal Other Distribution Assets	(40,855,675)	(45,595,356)	(4,739,681)	(50,161,392)	(4,566,036)	(52,743,589)	(2,582,197)	(54,150,050)	(1,406,461)	(55,985,092)	(1,835,042)	(58,353,169)	(2,368,077)
Gross Assets for Rate Base	**348,948,838**	**348,262,734**	**(686,104)**	**362,590,468**	**14,327,734**	**377,491,930**	**14,901,462**	**394,222,378**	**16,730,448**	**413,367,112**	**19,144,734**	**430,000,639**	**16,633,527**
WIP													
2040 - Electric Plant Held for Future Use	834,656	834,656	-	834,656	-	834,656	-	834,656	-	834,656	-	834,656	-
2055 - Construction Work in Progress--Electric	1,703,555	6,338,384	4,634,829	4,853,723	(1,484,661)	3,538,277	(1,315,446)	3,698,585	160,308	2,692,850	(1,005,735)	2,465,442	(227,408)
2070 - Other Utility Plant			-		-		-		-		-		-
Subtotal WIP	2,538,211	7,173,040	4,634,829	5,688,379	(1,484,661)	4,372,933	(1,315,446)	4,533,241	160,308	3,527,506	(1,005,735)	3,300,098	(227,408)
Total Assets Including WIP	**351,487,049**	**355,435,774**	**3,948,725**	**368,278,847**	**12,843,073**	**381,864,863**	**13,586,016**	**398,755,619**	**16,890,756**	**416,894,618**	**18,138,999**	**433,300,737**	**16,406,119**

Variance explanations for each year are described below. As per section 2.2.1.1 WNH has used a materiality level of $190,000 for its analysis:

1 **Table 2-20 – 2016 Board Approved vs 2016 Actual**

Description	2016 Board Approved	2016 Actual	Variance from 2016 Board Approved	%
Reporting Basis	**MIFRS**	**MIFRS**		
Transmission Assets				
1808 - Building - MS/TS	4,930,000	4,955,361	25,361	0.5%
1815 - Transformer Station Equipment >50 kV	33,219,290	32,705,987	(513,303)	-1.5%
1820 - Distribution Station Equipment <50 kV	5,691,670	5,123,535	(568,135)	-10.0%
Subtotal Transmission Assets	43,840,960	42,784,883	(1,056,077)	-2.4%
Distribution Assets				
1805 - Land	2,306,589	2,308,591	2,002	0.1%
1806/1612 - Land Rights	740,439	897,918	157,479	21.3%
1808 - Buildings	25,655,695	26,101,807	446,112	1.7%
1830 - Poles, Towers & Fixtures	72,032,011	74,856,216	2,824,205	3.9%
1835 - Overhead Conductors & Devices	41,305,544	41,862,980	557,436	1.3%
1840 - Underground Conduit	21,131,729	22,453,063	1,321,334	6.3%
1845 - Underground Conductors & Devices	49,728,827	52,988,372	3,259,545	6.6%
1850 - Line Transformers	61,613,848	59,431,568	(2,182,280)	-3.5%
1855 - Services (Overhead & Underground)	27,454,086	27,250,200	(203,886)	-0.7%
1860 - Meters	14,321,499	6,296,446	(8,025,053)	-2.2%
1860 - Meters (Smart Meters)		7,709,608	7,709,608	
Subtotal Distribution Assets	316,290,267	322,156,769	5,866,502	1.9%
General Plant				
1920 - Computer Hardware	4,343,439	4,343,126	(313)	0.0%
1925/1611 - Computer Software	7,695,475	6,837,432	(858,043)	-11.1%
1915 - Office Furniture & Equipment	1,584,130	1,601,542	17,412	1.1%
1930 - Transportation Equipment	9,429,508	9,406,406	(23,102)	-0.2%
1935 - Stores Equipment	542,506	655,921	113,415	20.9%
1940 - Tools, Shop & Garage Equipment	1,524,361	1,504,996	(19,365)	-1.3%
1945 - Measurement & Testing Equipment	956,204	938,092	(18,112)	-1.9%
1955 - Communications Equipment	944,263	983,246	38,983	4.1%
1960 - Miscellaneous Equipment	2,653,400	2,645,677	(7,723)	-0.3%
1980 - System Supervisor Equipment	5,230,237	5,114,556	(115,681)	-2.2%
Subtotal General Plant	34,903,523	34,030,994	(872,529)	-2.5%
Contribution and Grants				
1995 - Contributions & Grants	(33,424,664)	(31,831,420)	1,593,244	-4.8%
2440 - Deferred Revenue	(12,661,248)	(18,878,492)	(6,217,244)	49.1%
Subtotal Contribution and Grants	(46,085,912)	(50,709,912)	(4,624,000)	10.0%
Gross Assets for Rate Base	**348,948,838**	**348,262,734**	**(686,104)**	**-0.2%**

Transmission Asset Variance ($1,056,077)

There are three primary drivers for the decrease from plan. The first is the disposal of four municipal substations totalling $474K. The second driver was transformer station upgrades. A transfer trip protection system upgrade planned for 2016 was moved to 2018 and a transformer on-line monitoring project planned for 2016 was moved to 2017. These projects totalled $191K. Lastly there was a decrease in opening balance from 2015 due to two projects Breaker Refurbishment for $193K and New Replacement Breakers for $111K which were not capitalized in 2015.

Distribution Asset Variance $5,866,502

The primary driver was the increase in scope and cost of the LRT Project. The planned spend for the LRT project from 2015-2017 was $11.6M but actual additions for 2015-2017 was $15.6M due to significant scope changes. $12.5M was included in additions in 2016. A substantial portion of this was offset by the increase in capital contributions.

General Plant Asset Variance ($872,529)

There were two primary drivers that caused the decrease to General Plant. The new CIS which was planned to be in service in 2016 however it went into service in early 2017 totalling $341K. Asset Management Software totalling $277,000, was deferred due to WNH not being able to find a cost effective solution in the market place.

Contributions and Grants ($4,624,000)

The cost driver for the increase in contributions was the LRT project. The planned capital contribution for the LRT project was $8.1M for a net of $3.5M added to rate base. However, the final project capital contribution for 2015-2017 was $11.2M for a net rate base addition of $3.4M.

1

Table 2-21 – 2016 Actual vs 2017 Actual

Description	2016 Actual	2017 Actual	Variance from 2016 Actual	%
Reporting Basis	MIFRS	MIFRS		
Transmission Assets				
1808 - Building - MS/TS	4,955,361	4,924,608	(30,753)	-0.6%
1815 - Transformer Station Equipment >50 kV	32,705,987	33,014,622	308,635	0.9%
1820 - Distribution Station Equipment <50 kV	5,123,535	5,161,314	37,779	0.7%
Subtotal Transmission Assets	42,784,883	43,100,544	315,661	0.7%
Distribution Assets				
1805 - Land	2,308,591	2,300,541	(8,050)	-0.3%
1806/1612 - Land Rights	897,918	982,250	84,332	9.4%
1808 - Buildings	26,101,807	26,288,624	186,817	0.7%
1830 - Poles, Towers & Fixtures	74,856,216	79,558,421	4,702,205	6.3%
1835 - Overhead Conductors & Devices	41,862,980	44,874,408	3,011,428	7.2%
1840 - Underground Conduit	22,453,063	23,409,914	956,851	4.3%
1845 - Underground Conductors & Devices	52,988,372	55,522,228	2,533,856	4.8%
1850 - Line Transformers	59,431,568	62,526,072	3,094,504	5.2%
1855 - Services (Overhead & Underground)	27,250,200	28,471,071	1,220,871	4.5%
1860 - Meters	6,296,446	7,014,040	717,594	11.4%
1860 - Meters (Smart Meters)	7,709,608	7,709,608	-	0.0%
Subtotal Distribution Assets	322,156,769	338,657,177	16,500,408	5.1%
General Plant				
1920 - Computer Hardware	4,343,126	4,465,644	122,518	2.8%
1925/1611 - Computer Software	6,837,432	8,598,030	1,760,598	25.7%
1915 - Office Furniture & Equipment	1,601,542	1,626,810	25,268	1.6%
1930 - Transportation Equipment	9,406,406	9,494,548	88,142	0.9%
1935 - Stores Equipment	655,921	656,921	1,000	0.2%
1940 - Tools, Shop & Garage Equipment	1,504,996	1,537,566	32,570	2.2%
1945 - Measurement & Testing Equipment	938,092	967,137	29,045	3.1%
1955 - Communications Equipment	983,246	983,246	-	0.0%
1960 - Miscellaneous Equipment	2,645,677	2,664,237	18,560	0.7%
1980 - System Supervisor Equipment	5,114,556	5,127,022	12,466	0.2%
Subtotal General Plant	34,030,994	36,121,161	2,090,167	6.1%
Contribution and Grants				
1995 - Contributions & Grants	(31,831,420)	(31,831,420)	-	0.0%
2440 - Deferred Revenue	(18,878,492)	(23,456,994)	(4,578,502)	24.3%
Subtotal Contribution and Grants	(50,709,912)	(55,288,414)	(4,578,502)	9.0%
Gross Assets for Rate Base	**348,262,734**	**362,590,468**	**14,327,734**	**4.1%**

Transmission Asset Variance $315,661

The average additions for transmission assets from 2016-2021 is $864K. The reason for the decrease in 2017 related to Stations Equipment Additions including Transfer Trip Upgrades ($175K), Transformer Bus Duct and Bushing Refurbishments ($89K) and other miscellaneous that remained in Work in Progress (WIP) at the end of 2017.

Distribution Asset Variance $16,500,408

The average additions for distribution assets from 2016-2021 is $16.2M. The increases in 2017 focused on removing 4kV from the service territory in Overhead (OH) Line Renewal which continued until 2019. The main drivers of asset additions included $6.1M for OH Line Renewal, $2.7M for customer connections, $1.8M for Expansions, $1.6M for Relocations, $1.5M for Underground (UG) Line Renewal and $1.0M for Reactive and Proactive Renewal Projects.

General Plant Asset Variance $2,090,167

The average additions for general plant assets from 2016-2021 is $2.1M. In 2017 WNH had additions at this average. The main addition in 2017 was for the new CIS totalling $1.4M.

Contributions and Grants ($4,578,502)

The average additions for contributions and grants from 2016-2021 is ($2.9M). In 2017 WNH received $615K for a subdivision and $781K for the final portions of the LRT project.

1

Table 2-22 – 2017 Actual vs 2018 Actual

Description	2017 Actual	2018 Actual	Variance from 2017 Actual	%
Reporting Basis	MIFRS	MIFRS		
Transmission Assets				
1808 - Building - MS/TS	4,924,608	5,034,512	109,904	2.2%
1815 - Transformer Station Equipment >50 kV	33,014,622	33,873,617	858,995	2.6%
1820 - Distribution Station Equipment <50 kV	5,161,314	5,161,314	-	0.0%
Subtotal Transmission Assets	43,100,544	44,069,443	968,899	2.2%
Distribution Assets				
1805 - Land	2,300,541	2,300,541	-	0.0%
1806/1612 - Land Rights	982,250	1,059,625	77,375	7.9%
1808 - Buildings	26,288,624	26,319,019	30,395	0.1%
1830 - Poles, Towers & Fixtures	79,558,421	84,294,693	4,736,272	6.0%
1835 - Overhead Conductors & Devices	44,874,408	47,658,199	2,783,791	6.2%
1840 - Underground Conduit	23,409,914	24,850,240	1,440,326	6.2%
1845 - Underground Conductors & Devices	55,522,228	58,141,398	2,619,170	4.7%
1850 - Line Transformers	62,526,072	65,224,372	2,698,300	4.3%
1855 - Services (Overhead & Underground)	28,471,071	29,499,969	1,028,898	3.6%
1860 - Meters	7,014,040	7,536,419	522,379	7.4%
1860 - Meters (Smart Meters)	7,709,608	7,709,608	-	0.0%
Subtotal Distribution Assets	338,657,177	354,594,083	15,936,906	4.7%
General Plant				
1920 - Computer Hardware	4,465,644	4,667,790	202,146	4.5%
1925/1611 - Computer Software	8,598,030	9,578,601	980,571	11.4%
1915 - Office Furniture & Equipment	1,626,810	1,685,037	58,227	3.6%
1930 - Transportation Equipment	9,494,548	8,627,348	(867,200)	-9.1%
1935 - Stores Equipment	656,921	697,911	40,990	6.2%
1940 - Tools, Shop & Garage Equipment	1,537,566	1,624,121	86,555	5.6%
1945 - Measurement & Testing Equipment	967,137	1,004,958	37,821	3.9%
1955 - Communications Equipment	983,246	983,246	-	0.0%
1960 - Miscellaneous Equipment	2,664,237	2,702,981	38,744	1.5%
1980 - System Supervisor Equipment	5,127,022	5,513,754	386,732	7.5%
Subtotal General Plant	36,121,161	37,085,747	964,586	2.7%
Contribution and Grants				
1995 - Contributions & Grants	(31,831,420)	(31,831,420)	-	0.0%
2440 - Deferred Revenue	(23,456,994)	(26,425,923)	(2,968,929)	12.7%
Subtotal Contribution and Grants	(55,288,414)	(58,257,343)	(2,968,929)	5.4%
Gross Assets for Rate Base	**362,590,468**	**377,491,930**	**14,901,462**	**4.1%**

Transmission Asset Variance $968,899

The main drivers of the increases were the capitalization and completion of the Remote Trip Upgrade ($252K), Transformer On-Line Monitoring ($160) and the Breaker Refurbishment ($143K). A portion of these costs were included in WIP in 2017.

Distribution Asset Variance $15,936,906

WNH continued its phase out of 4kV lines in 2018 however less work was completed on this project in 2018 compared to 2017. There was also a large OH to UG burial project that was capitalized in 2018 in the amount of $1.6M. The main drivers of asset additions included $4.7M for OH Line Renewal, $2.1M for customer connections, $883K for Expansions, $3.7M for Relocations, $1.7M for Underground (UG) Line Renewal and $1.3M for Reactive and Proactive Renewal Projects.

General Plant Asset Variance $964,586

There were three main drivers for the asset additions in 2018. First, there were post-cutover enhancements to the CIS required in the amount of $440K. There was a system upgrade of the ArcGIS software in the amount of $206K. Lastly, there was a purchase of a 55-foot Single Bucket Truck totalling $412K.

Contributions and Grants ($2,968,929)

There were two main drivers for the increase in contributions including amounts received for the large OH to UG burial project noted above totalling $735K and contributions for a large road relocation project $213K. All other contributions were less than materiality.

1 **Table 2-23 – 2018 Actual vs 2019 Actual**

Description	2018 Actual	2019 Actual	Variance from 2018 Actual	%
Reporting Basis	**MIFRS**	**MIFRS**		
Transmission Assets				
1808 - Building - MS/TS	5,034,512	5,087,726	53,214	1.1%
1815 - Transformer Station Equipment >50 kV	33,873,617	34,380,822	507,205	1.5%
1820 - Distribution Station Equipment <50 kV	5,161,314	5,161,314	-	0.0%
Subtotal Transmission Assets	44,069,443	44,629,862	560,419	1.3%
Distribution Assets				
1805 - Land	2,300,541	2,300,541	-	0.0%
1806/1612 - Land Rights	1,059,625	1,124,311	64,686	6.1%
1808 - Buildings	26,319,019	26,327,023	8,004	0.0%
1830 - Poles, Towers & Fixtures	84,294,693	88,312,795	4,018,102	4.8%
1835 - Overhead Conductors & Devices	47,658,199	50,500,760	2,842,561	6.0%
1840 - Underground Conduit	24,850,240	26,327,848	1,477,608	5.9%
1845 - Underground Conductors & Devices	58,141,398	60,522,169	2,380,771	4.1%
1850 - Line Transformers	65,224,372	68,672,604	3,448,232	5.3%
1855 - Services (Overhead & Underground)	29,499,969	30,705,351	1,205,382	4.1%
1860 - Meters	7,536,419	8,720,816	1,184,397	15.7%
1860 - Meters (Smart Meters)	7,709,608	7,709,608	-	0.0%
Subtotal Distribution Assets	354,594,083	371,223,826	16,629,743	4.7%
General Plant				
1920 - Computer Hardware	4,667,790	4,894,631	226,841	4.9%
1925/1611 - Computer Software	9,578,601	9,814,599	235,998	2.5%
1915 - Office Furniture & Equipment	1,685,037	1,718,522	33,485	2.0%
1930 - Transportation Equipment	8,627,348	9,314,198	686,850	8.0%
1935 - Stores Equipment	697,911	697,911	-	0.0%
1940 - Tools, Shop & Garage Equipment	1,624,121	1,689,371	65,250	4.0%
1945 - Measurement & Testing Equipment	1,004,958	1,038,278	33,320	3.3%
1955 - Communications Equipment	983,246	635,827	(347,419)	-35.3%
1960 - Miscellaneous Equipment	2,702,981	2,715,403	12,422	0.5%
1980 - System Supervisor Equipment	5,513,754	6,218,233	704,479	12.8%
Subtotal General Plant	37,085,747	38,736,973	1,651,226	4.5%
Contribution and Grants				
1995 - Contributions & Grants	(31,831,420)	(31,831,420)	-	0.0%
2440 - Deferred Revenue	(26,425,923)	(28,536,863)	(2,110,940)	8.0%
Subtotal Contribution and Grants	(58,257,343)	(60,368,283)	(2,110,940)	3.6%
Gross Assets for Rate Base	**377,491,930**	**394,222,378**	**16,730,448**	**4.4%**

Transmission Asset Variance $560,419

In 2019 there were less transmission asset additions than in 2018. The main driver for the additions was a Transformer Bus Duct and Bushing Refurbishment totalling $326K.

Distribution Asset Variance $16,629,743

In 2019 WNH completed its phase out of 4kV lines. Also there was an increase in commercial metering costs in order to convert interval meters to ESM totalling $403K. The main drivers of asset additions included $5.7M for OH Line Renewal, $2.8M for customer connections, $1.9M for Expansions, $415K for Relocations, $2.0M for Underground (UG) Line Renewal and $1.2M for Reactive and Proactive Renewal Projects.

General Plant Asset Variance $1,651,226

In 2019, WNH purchased several vehicles due to the end of life replacements and disposal of many vehicles in 2018. The total vehicle purchase cost was $718K with one 46-foot Single Bucket Truck being the highest cost at $414K. Additionally in 2019, WNH upgraded its phone systems at an amount of $189K.

Contributions and Grants ($2,110,940)

Capital contributions were back to more normal levels in 2019. There was one large subdivision project with capital contributions totalling $479K. The remainder of contributions were below materiality.

1 **Table 2-24 – 2019 Actual vs 2020 Bridge**

Description	2019 Actual	2020 Bridge	Variance from 2019 Actual	%
Reporting Basis	**MIFRS**	**MIFRS**		
Transmission Assets				
1808 - Building - MS/TS	5,087,726	5,103,512	15,786	0.3%
1815 - Transformer Station Equipment >50 kV	34,380,822	35,591,403	1,210,581	3.5%
1820 - Distribution Station Equipment <50 kV	5,161,314	5,287,844	126,530	2.5%
Subtotal Transmission Assets	44,629,862	45,982,759	1,352,897	3.0%
Distribution Assets				
1805 - Land	2,300,541	2,300,541	-	0.0%
1806/1612 - Land Rights	1,124,311	1,209,544	85,233	7.6%
1808 - Buildings	26,327,023	26,327,023	-	0.0%
1830 - Poles, Towers & Fixtures	88,312,795	92,331,866	4,019,071	4.6%
1835 - Overhead Conductors & Devices	50,500,760	52,601,160	2,100,400	4.2%
1840 - Underground Conduit	26,327,848	27,443,543	1,115,695	4.2%
1845 - Underground Conductors & Devices	60,522,169	62,644,198	2,122,029	3.5%
1850 - Line Transformers	68,672,604	73,622,060	4,949,456	7.2%
1855 - Services (Overhead & Underground)	30,705,351	31,992,565	1,287,214	4.2%
1860 - Meters	8,720,816	9,481,746	760,930	8.7%
1860 - Meters (Smart Meters)	7,709,608	7,709,608	-	0.0%
Subtotal Distribution Assets	371,223,826	387,663,854	16,440,028	4.4%
General Plant				
1920 - Computer Hardware	4,894,631	5,174,684	280,053	5.7%
1925/1611 - Computer Software	9,814,599	11,864,349	2,049,750	20.9%
1915 - Office Furniture & Equipment	1,718,522	1,873,588	155,066	9.0%
1930 - Transportation Equipment	9,314,198	9,787,080	472,882	5.1%
1935 - Stores Equipment	697,911	697,911	-	0.0%
1940 - Tools, Shop & Garage Equipment	1,689,371	1,724,371	35,000	2.1%
1945 - Measurement & Testing Equipment	1,038,278	1,038,278	-	0.0%
1955 - Communications Equipment	635,827	635,827	-	0.0%
1960 - Miscellaneous Equipment	2,715,403	2,909,503	194,100	7.1%
1980 - System Supervisor Equipment	6,218,233	6,448,997	230,764	3.7%
Subtotal General Plant	38,736,973	42,154,588	3,417,615	8.8%
Contribution and Grants				
1995 - Contributions & Grants	(31,831,420)	(31,831,420)	-	0.0%
2440 - Deferred Revenue	(28,536,863)	(30,602,669)	(2,065,806)	7.2%
Subtotal Contribution and Grants	(60,368,283)	(62,434,089)	(2,065,806)	3.4%
Gross Assets for Rate Base	**394,222,378**	**413,367,112**	**19,144,734**	**4.9%**

Transmission Asset Variance $1,352,897

Transmission asset additions are planned to be increased in 2020 from 2019. The main projects include Transformer Bus Duct and Bushing Refurbishment ($268K), Feeder Breaker Upgrade ($230K) and a Transformer Upgrade to Online Gas Analyzer ($192K). The remaining projects are below materiality.

Distribution Asset Variance $16,440,028

The majority of capital spend is relatively level in 2020 compared to 2019 however the major change in 2020 is due to high yearend WIP in 2019. WNH anticipates that it will complete and capitalize many carryover projects from 2019 and will have a smaller remaining WIP balance at the end of the year. The main drivers of asset additions included $4.9M for OH Line Renewal, $3.0M for customer connections, $1.5M for Expansions, $1.8M for Relocations, $1.8M for Underground (UG) Line Renewal and $1.2M for Reactive and Proactive Renewal Projects.

General Plant Asset Variance $3,417,615

There is a large increase in General Plant asset additions in 2020. This is due to several software enhancements, upgrade and implementation projects including CIS-MDM-ODS Enhancements ($311K), Asset Management ($281K), Utility Design Software ($257K) and an RNI Upgrade ($192K).

Contributions and Grants ($2,065,806)

Capital contributions continue to remain at normal levels in 2020. The main driver relates to new underground service connections. The remainder are a mixture of new subdivisions, load displacement connections and road relocations.

1
Table 2-25 – 2020 Bridge vs 2021 Test

Description	2020 Bridge	2021 Test	Variance from 2020 Forecast	%
Reporting Basis	MIFRS	MIFRS		
Transmission Assets				
1808 - Building - MS/TS	5,103,512	5,422,617	319,105	6.3%
1815 - Transformer Station Equipment >50 kV	35,591,403	36,299,071	707,668	2.0%
1820 - Distribution Station Equipment <50 kV	5,287,844	5,385,235	97,391	1.8%
Subtotal Transmission Assets	45,982,759	47,106,923	1,124,164	2.4%
Distribution Assets				
1805 - Land	2,300,541	2,300,541	-	0.0%
1806/1612 - Land Rights	1,209,544	1,294,693	85,149	7.0%
1808 - Buildings	26,327,023	26,327,023	-	0.0%
1830 - Poles, Towers & Fixtures	92,331,866	96,076,261	3,744,395	4.1%
1835 - Overhead Conductors & Devices	52,601,160	54,531,241	1,930,081	3.7%
1840 - Underground Conduit	27,443,543	28,560,785	1,117,242	4.1%
1845 - Underground Conductors & Devices	62,644,198	64,859,645	2,215,447	3.5%
1850 - Line Transformers	73,622,060	78,314,137	4,692,077	6.4%
1855 - Services (Overhead & Underground)	31,992,565	33,107,582	1,115,017	3.5%
1860 - Meters	9,481,746	10,152,434	670,688	7.1%
1860 - Meters (Smart Meters)	7,709,608	7,709,608	-	0.0%
Subtotal Distribution Assets	387,663,854	403,233,950	15,570,096	4.0%
General Plant				
1920 - Computer Hardware	5,174,684	5,399,619	224,935	4.3%
1925/1611 - Computer Software	11,864,349	12,429,826	565,477	4.8%
1915 - Office Furniture & Equipment	1,873,588	2,005,088	131,500	7.0%
1930 - Transportation Equipment	9,787,080	10,885,312	1,098,232	11.2%
1935 - Stores Equipment	697,911	827,911	130,000	18.6%
1940 - Tools, Shop & Garage Equipment	1,724,371	1,762,371	38,000	2.2%
1945 - Measurement & Testing Equipment	1,038,278	1,038,278	-	0.0%
1955 - Communications Equipment	635,827	635,827	-	0.0%
1960 - Miscellaneous Equipment	2,909,503	3,028,703	119,200	4.1%
1980 - System Supervisor Equipment	6,448,997	6,723,314	274,317	4.3%
Subtotal General Plant	42,154,588	44,736,249	2,581,661	6.1%
Contribution and Grants				
1995 - Contributions & Grants	(31,831,420)	(31,831,420)	-	0.0%
2440 - Deferred Revenue	(30,602,669)	(33,245,063)	(2,642,394)	8.6%
Subtotal Contribution and Grants	(62,434,089)	(65,076,483)	(2,642,394)	4.2%
Gross Assets for Rate Base	**413,367,112**	**430,000,639**	**16,633,527**	**4.0%**

Transmission Asset Variance $1,124,164

Transmission asset additions are planned to decrease in 2021 from 2020. The main project additions included a Feeder Breaker Upgrade ($210K), Transformer Upgrade to Online Monitoring ($197K) and Bulk Projection Relay Upgrades ($126K).

Distribution Asset Variance $15,570,096

In 2021 WNH is focusing on renewing the assets that have been identified as in poor and very poor condition by WNH's Asset Condition Assessment program. Details on the 2021 Plan can be found in section 1.4.3 of the DSP. The main drivers of asset additions include $4.7M for OH Line Renewal, $2.1M for customer connections, $883K for Expansions, $1.4M for Relocations, $1.7M for Underground (UG) Line Renewal and $1.3M for Reactive and Proactive Renewal Projects.

General Plant Asset Variance $2,581,661

General Plant capital asset additions are planned to decrease in 2021 compared to 2020. There are significantly less software projects planned for 2021. The main driver for the asset additions are the purchase of several vehicles totalling $850K with the largest being a new 55-foot Single Bucket Truck costing $482K.

Contributions and Grants ($2,642,394)

Capital contributions are planned to increase in 2021 compared to 2020. The main driver includes a large project moving from OH to UG totalling $682K. The remainder include a mixture of new subdivisions, load displacement connections and road relocations.

2.2.1.3 ALLOWANCE FOR WORKING CAPITAL

The Filing Requirements permit applicants to take one of two approaches for the calculation of the Allowance for Working Capital; the 7.5% Allowance Approach or the filing of a lead/lag study. Using the 7.5% Allowance Approach, the Working Capital Allowance is calculated to be 7.5% of the sum of Cost of Power ("COP") and Controllable Expenses (Operations, Maintenance, Billing and Collecting, Community Relations, Administration and General, LEAP donations and Property Taxes). WNH did not conduct a lead lag study and is using the 7.5% Allowance Approach in accordance with the Filing Requirements.

The Working Capital Allowance for the 2021 Test Year is based upon 7.5% of the COP and Controllable Expenses. In calculating the Working Capital Allowance for 2016 to 2018 Actual, 2019 Actual - Projected and for the 2020 Bridge Year, WNH used the Board's historical 7.5% Allowance Approach.

Table 2-26 - Summary of Working Capital Allowance

Description	2016 Board Approved	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
Distribution Expenses - Operation	5,689,381	5,818,874	5,949,887	6,021,921	6,269,001	6,039,717	6,310,421
Distribution Expenses - Maintenance	1,613,140	1,543,946	1,608,420	1,963,196	1,497,703	1,867,332	1,903,411
Billing and Collecting	2,802,731	2,728,245	2,823,342	3,100,765	2,966,160	3,008,184	3,137,007
Community Relations	142,200	104,616	129,492	200,330	244,189	347,738	508,564
Administrative and General Expenses	2,869,882	2,584,121	3,054,727	3,223,637	3,482,548	3,778,758	3,869,654
Donations - LEAP	42,000	42,000	42,000	42,000	42,000	42,000	48,000
Taxes Other than Income Taxes	489,734	471,270	448,350	444,419	458,134	462,373	471,620
Less Allocated Depreciation	(173,427)	(786,675)	(780,501)	(766,351)	(735,577)	(707,129)	(724,487)
Total Distribution Expenses	**13,475,641**	**12,506,397**	**13,275,717**	**14,229,917**	**14,224,158**	**14,838,973**	**15,524,190**
Power Supply Expenses	177,131,268	186,434,129	169,230,868	168,077,848	173,595,406	211,267,074	199,535,876
Total Working Capital Expenses	**190,606,909**	**198,940,526**	**182,506,585**	**182,307,765**	**187,819,564**	**226,106,047**	**215,060,066**
Working Capital Factor	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Total Working Capital Allowance	**14,295,518**	**14,920,539**	**13,687,994**	**13,673,082**	**14,086,467**	**16,957,953**	**16,129,505**

As shown in Table 2-26, the 2021 Working Capital Allowance has increased $1,833,987 or 12.8% in comparison to the 2016 Board Approved Year. The change between the 2021 Test Year and 2016 Board Approved Year is a result of increased working capital requirements due to increased Cost of Power costs and increased Controllable Expenses.

Approximately 92% of the working capital increase of $24,453,157, which translates to an increased Working Capital Allowance for Rate Base purposes of $1,833,987, is related to Cost of Power. Controllable OM&A expenses represent 8% of the increase over the 2016 Board-Approved amounts for working capital and details on the expenses can be found in Exhibit 4 – Operating Costs.

Cost of Power Calculations

WNH has calculated COP for the 2021 Test Year based upon the 2021 Load Forecast, adjusted for the impact of Conservation and Demand Management Activities and in accordance with the Board's Filing Requirements. A summary of the Total COP expenses is provided in Table 2-27.

Table 2-27 - Summary of Total Cost of Power Expenses

Cost of Power	2016 Board Approved	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
4705 - Power Purchased	80,243,135	85,834,548	72,628,032	76,715,892	73,606,674	105,197,705	100,899,496
4707 - Global Adjustment	74,070,587	80,150,759	77,561,877	71,769,759	80,974,330	86,240,845	79,267,099
4708 - Charges - WMS	8,626,528	6,521,472	5,829,190	5,859,764	5,635,592	5,733,289	5,219,756
4714 - Charges - Network	10,190,603	9,862,836	9,363,428	9,705,048	9,257,356	9,894,751	9,788,482
4716 - Charges - Connection	3,222,585	3,281,784	3,065,791	3,385,011	3,479,511	3,363,484	3,519,327
4750 - Charges - LV	272,000	271,726	265,184	273,799	267,019	447,000	447,000
4751 - Smart Meter Entity Charge	505,830	511,004	517,366	368,575	374,924	390,000	394,716
Total	**177,131,268**	**186,434,129**	**169,230,868**	**168,077,848**	**173,595,406**	**211,267,074**	**199,535,876**

Commodity Prices

In accordance with the Filing Requirements, the commodity price estimate used to calculate the COP must be determined by the split between RPP and non-RPP Class A and Class B customers based on actual data and using the most current RPP (TOU) prices established for the May 1, 2019 to October 31, 2019 period. The Regulated Price

Plan and Non-RPP price was obtained from the “Regulated Price Plan: Price Report – May 1, 2019 to October 31, 2019.” Chapter 2 Filing Appendix 2-Za and 2-Zb are attached as Attachment 2-1 to this exhibit.

For the purposes of calculating the 2021 Test Year, WNH has used an average of $.12803 per kWh for RPP customers. For Non-RPP customers, WNH has used an average of $.02009 for HOEP pricing and $.10694 per kWh for Global Adjustment Charges. For Class A customers, WNH used an average GA pricing for GS > 50 kW of $.08088 per kWh and for Large Users an average price of $.09288 per kWh.

WNH understands that the commodity charge will be updated to reflect any changes to commodity prices that may become available prior to the approval of its Application.

Table 2-28 - 2021 Cost of Power Calculation (Appendix 2-Za and 2-Zb)

Step 1: **2021 Forecasted Commodity Prices**

Forecasted Commodity Prices	Table 1: Average RPP Supply Cost Summary*		non-RPP	RPP
HOEP ($/MWh)	Load-Weighted Price for RPP Consumers		$20.09	$20.09
Global Adjustment ($/MWh)	Impact of the Global Adjustment		$106.94	$106.94
Adjustments ($/MWh)				$1.00
TOTAL ($/MWh)	Average Supply Cost for RPP Consumers			**$128.03**

Step 2: **Commodity Expense**

(volumes for the bridge and test year are loss adjusted)

Commodity

Customer		Revenue	Expense		2021 Test Year					
Class Name	UoM	USA #	USA #	Class A Non-RPP Volume**		Class B Non-RPP Volume**	Class B RPP Volume**	Average HOEP	Average RPP Rate	Amount
Residential	kWh	4006	4705			5,766,935	403,235,509	$ 0.02009	$ 0.12803	$51,742,100
General Service < 50 kW	kWh	4010	4705			18,486,202	183,991,361	$ 0.02009	$ 0.12803	$23,927,802
General Service > 50 to 4999 kW	kWh	4035	4705	217,110,653		423,876,941	71,220,844	$ 0.02009	$ 0.12803	$21,995,845
Large User	kWh	4010	4705	96,044,387				$ 0.02009	$ 0.12803	$1,929,532
Direct Market Participant	kWh	4025	4705			9,541,353				$0
Street Lights	kWh	4025	4705			3,465,902		$ 0.02009	$ 0.12803	$69,630
Unmetered Scattered Loads	kWh	4025	4705				3,051,147	$ 0.02009	$ 0.12803	$390,638
Embedded Distributor	kWh	4025	4705			42,008,402		$ 0.02009	$ 0.12803	$843,949
	kWh	4025	4705					$ 0.02009	$ 0.12803	$0
TOTAL				**313,155,040**		**503,145,733**	**661,498,861**			**$100,899,496**

Class A - non-RPP Global Adjustment

Customer		Revenue	Expense	Amount	2021 kWh Volume				Hist. Avg GA/kWh ***	Amount
General Service > 50 to 4999 kW		4035	4707		217,110,653				0.080882777	$17,560,513
Large User		4010	4707		96,044,387				0.092879286	$8,920,534
		4010	4707							
				-	313,155,040					**$26,481,047**

Class B - non-RPP Global Adjustment

Customer		Revenue	Expense		2021					Amount
Class Name	UoM	USA #	USA #			Class B Non-RPP Volume			GA Rate/kWh	
Residential	kWh	4006	4707			5,766,935			$ 0.10694	$616,716
General Service < 50 kW	kWh	4010	4707			18,486,202			$ 0.10694	$1,976,914
General Service > 50 to 4999 kW	kWh	4035	4707			423,876,941			$ 0.10694	$45,329,400
Large User	kWh	4010	4707			0			$ 0.10694	$0
Direct Market Participant	kWh	4025	4707			9,541,353				$0
Street Lights	kWh	4025	4707			3,465,902			$ 0.10694	$370,644
Unmetered Scattered Loads	kWh	4025	4707			0			$ 0.10694	$0
Embedded Distributor	kWh	4025	4707			42,008,402			$ 0.10694	$4,492,378
Total Volume						**503,145,733**				
TOTAL										**$52,786,052**

Cost of Power Calculation
2Zb

All Volume should be loss adjusted with the exception of:
* Volume loss adjusted less WMP
** No loss adjustment for kWh

		2021 Test Year	**RPP**		**2021 Test Year**	**non-RPP**		**Total**	
Electricity Commodity	**Units**	Volume	Rate	$	Volume	Rate	$	$	
Class per Load Forecast				-					
Residential	kWh	403,235,509		51,626,242	5,766,935		115,858		
General Service < 50 kW	kWh	183,991,361		23,556,414	18,486,202		371,388		
General Service > 50 to 4999 kW	kWh*	71,220,844		9,118,405	640,987,594		12,877,441		
Large User	kWh*	0		-	96,044,387		1,929,532		
Direct Market Participant	kWh	0		-	9,541,353		-		
Street Lights	kWh	0		-	3,465,902		69,630		
Unmetered Scattered Loads	kWh	3,051,147		390,638	0		-		
Embedded Distributor	kWh	0		-	42,008,402		843,949		
SUB-TOTAL		661,498,861		84,691,699	816,300,773		16,207,797	$ 100,899,496	OK
Global Adjustment non-RPP	**Units**								
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total	
Residential				0			616,716		
General Service < 50 kW				0			1,976,914		
General Service > 50 to 4999 kW				0			62,889,913		
Large User				0			8,920,534		
Direct Market Participant				0			-		
Street Lights				0			370,644		
Unmetered Scattered Loads				0			-		
Embedded Distributor							4,492,378		
SUB-TOTAL		0		0			79,267,099	$ 79,267,099	OK
Transmission - Network									
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total	
Residential	kWh	403,235,509	0.0071	2,865,384	5,766,935	0.0071	40,980		
General Service < 50 kW	kWh	183,991,361	0.0066	1,217,889	18,486,202	0.0066	122,365		
General Service > 50 to less than 1,	kW	175,506	2.7039	474,546	429,792	2.7039	1,162,103		
General Service > 50 - Interval Met	kW	73,261	2.8720	210,404	592,314	2.8720	1,701,117		
General Service > 50 - Interval Met	kW		2.8681	-	470,812	2.8681	1,350,333		
Large User	kW		3.1797	-	169,287	3.1797	538,279		
Direct Market Participant	kW		2.8720	-	22,951	2.8720	65,915		
Street Lights	kW		2.0393	-	9,302	2.0393	18,970		
Unmetered Scattered Loads	kWh	3,051,147	0.0066	20,196	-	0.0066	-		
SUB-TOTAL				4,788,420			5,000,062	9,788,482	
Transmission - Connection									
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total	
Residential	kWh	403,235,509	0.0025	1,021,100	5,766,935	0.0025	14,603		
General Service < 50 kW	kWh	183,991,361	0.0023	430,076	18,486,202	0.0023	43,211		
General Service > 50 to less than 1,	kW	175,506	0.8817	154,746	429,792	0.8817	378,954		
General Service > 50 - Interval Met	kW	73,261	1.1011	80,671	592,314	1.1011	652,224		
General Service > 50 - Interval Met	kW	-	1.1001	-	470,812	1.1001	517,929		
Large User	kW	-	1.1050	-	169,287	1.1050	187,069		
Direct Market Participant	kW	-	1.1011	-	22,951	1.1011	25,272		
Street Lights	kW	-	0.6814	-	9,302	0.6814	6,338		
Unmetered Scattered Loads	kWh	3,051,147	0.0023	7,132	-	0.0023	-		
SUB-TOTAL				1,693,725			1,825,602	3,519,327	

		2021 Test Year	RPP		2021 Test Year	non-RPP		Total
Wholesale Market Service								
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh	403,235,509	0.003	1,209,707	5,766,935	0.003	17,301	
General Service < 50 kW	kWh	183,991,361	0.003	551,974	18,486,202	0.003	55,459	
General Service > 50 to 4999 kW	kWh*	71,220,844	0.003	213,663	640,987,594	0.003	1,922,963	
Large User	kWh*		0.003	-	96,044,387	0.003	288,133	
Direct Market Participant	kWh*		-	-	9,541,353	-	-	
Street Lights	kWh		0.003	-	3,465,902	0.003	10,398	
Unmetered Scattered Loads	kWh	3,051,147	0.003	9,153	-	0.003	-	
Embedded Distributor	kWh	-	0.003		42,008,402	0.003	126,025	
SUB-TOTAL				1,984,497			2,420,278	4,404,775
Class A CBR								
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total
General Service > 50 to 4999 kW	kWh*	-	-	-	217,110,653	0.000258	56,055	
Large User	kWh*	-	-	-	96,044,387	0.000258	24,797	
SUB-TOTAL				-			80,852	80,852
RRRP								
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh	403,235,509	0.0005	201,618	5,766,935	0.0005	2,883	
General Service < 50 kW	kWh	183,991,361	0.0005	91,996	18,486,202	0.0005	9,243	
General Service > 50 to 4999 kW	kWh	71,220,844	0.0005	35,610	640,987,594	0.0005	320,494	
Large User	kWh	-	0.0005	-	96,044,387	0.0005	48,022	
Direct Market Participant	kWh	-	-	-	9,541,353	-	-	
Street Lights	kWh	-	0.0005	-	3,465,902	0.0005	1,733	
Unmetered Scattered Loads	kWh	3,051,147	0.0005	1,526	-	0.0005	-	
Embedded Distributor	kWh	-	0.0005	-	42,008,402	0.0005	21,004	
SUB-TOTAL				330,749			403,380	734,129
Low Voltage - No TLF adjustment								
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh**	389,486,631	0.0004	137,182	5,570,303	0.0004	1,962	
General Service < 50 kW	kWh**	177,717,918	0.0003	57,780	17,855,889	0.0003	5,805	
General Service > 50 to 4999 kW	kW	248,767	0.1226	30,508	1,492,918	0.1226	183,088	
Large User	kW	-	0.1537	-	169,287	0.1537	26,019	
Direct Market Participant	kW	-	0.1226	-	22,951	0.1226	2,815	
Street Lights	kW	-	0.0948	-	9,302	0.0948	882	
Unmetered Scattered Loads	kWh**	2,947,114	0.0003	958	-	0.0003	-	
SUB-TOTAL				226,429			220,571	447,000
Smart Meter Entity Charge								
Class per Load Forecast		Customers	Rate	$	Customers	Rate	$	Total
Residential		50,989	0.57	348,765	729	0.57	4,986	
General Service < 50 kW		5,442	0.57	37,223	547	0.57	3,741	
Seasonal				-				
SUB-TOTAL				385,988			8,728	394,716
SUB- TOTAL				94,101,507			105,434,369	199,535,876
ORECA CREDIT	31.80%			(29,924,279)			0	(29,924,279)
TOTAL				**64,177,228**			**105,434,369**	**169,611,597**

***The ORECA Credit of 31.8% will only apply to RPP proportion of the listed components. Impacts on distribution charges are excluded for the purpose of calculating the cost of power.

**** Class A CBR: use the average CBR per kWh, similar to how the Class A GA cost is calculated

1 For the 2021 Test Year, the COP breaks down as follows:

2 **Table 2-29 Test Year Cost of Power**

Cost of Power	2021 Test
4705 - Power Purchased	100,899,496
4707 - Global Adjustment	79,267,099
4708 - Charges - WMS	5,219,756
4714 - Charges - Network	9,788,482
4716 - Charges - Connection	3,519,327
4750 - Charges - LV	447,000
4751 - Smart Meter Entity Charge	394,716
Misc A/R or A/P	(29,924,279)
Total	**169,611,597**

3 Table 2-29 provides the breakdown of the various components to the COP. WNH has
4 used the most recent Uniform Transmission Rates (UTRs), Smart Meter Entity charge,
5 Low Voltage charge and regulatory charges to calculate the COP. The details of these
6 charges are discussed in Exhibit 8.

2.2.2 CAPITAL EXPENDITURES

2.2.2.1 DISTRIBUTION SYSTEM PLAN

In accordance with the Filing Requirements, WNH is filing its consolidated Distribution System Plan (DSP) as a stand-alone document which includes all elements of the DSP as Attachment 2-2 of this Exhibit. WNH has prepared a Distribution System Plan (DSP) in accordance with the OEB's Chapter 5 Consolidated Distribution System Plan Filing Requirements dated May 14, 2020 (Chapter 5 Filing Requirements) in support of its 2021 Test Year Cost of Service Application. The DSP incorporates matters pertaining to asset management, regional planning, and renewable energy generation.

All categories of system investments, including System Renewal, System Access, System Service, and General Plant have been addressed and consolidated in WNH's capital expenditure plan. WNH provided historical spending by material capital project in the categories mentioned for 2016 – 2019 Actual, 2020 Bridge and 2021 Test Year. WNH assigned all historical and future construction projects to the new categories as required by the Board. WNH leveled the plan to address pacing and affordability.

Information related to the Regional Planning Process is found in section 2.1.7.2 and 2.2.2 of the DSP.

Based on the evaluation of the distribution system WNH is not proposing any capital investments for capacity upgrades to accommodate applications for the connection of renewable energy generation for the 2021 Test Year.

2.2.2.2 CAPITAL EXPENDITURES SUMMARY AND VARIANCE ANALYSIS

Summary of Capital Expenditures

For purposes of Appendix 2-AB, WNH included all capital expenditures incurred in the year based on the projects that were undertaken and money that has been spent. The variance between the annual capital expenditures totals in Appendix 2-AB and Table 2-30 and the total fixed asset additions in the fixed asset continuity schedules (Appendix 2-BA) are due to change in Work in Progress.

Table 2-30 Capital Expenditure Summary 2016-2025 – Appendix 2-AB (in '000s)

OEB Investment Category	Historical Period												Bridge Year			Test Year	Forecast Period			
	2016			2017			2018			2019			2020			2021	2022	2023	2024	2025
	Plan	Actual	Var %	Plan	Actual	Var %	Plan	Actual	Var %	Plan	Actual	Var %	Plan	Budget	Var %	Budget	Forecast	Forecast	Forecast	Forecast
System Access	11,172	17,628	57.8%	7,521	6,299	-16.2%	6,020	6,091	1.2%	5,947	6,243	5.0%	6,086	5,839	-4.1%	5,840	6,166	6,305	6,448	6,592
System Renewal	7,360	7,801	6.0%	10,001	9,482	-5.2%	9,438	8,424	-10.7%	8,801	9,439	7.2%	8,976	8,612	-4.1%	8,096	9,372	9,548	9,693	9,951
System Service	2,406	1,742	-27.6%	1,680	567	-66.3%	1,725	1,822	5.6%	1,175	2,449	108.4%	1,176	2,199	87.0%	2,294	1,346	1,288	1,211	1,212
General Plant	1,869	2,288	22.4%	2,814	2,265	-19.5%	1,661	2,030	22.2%	1,670	1,810	8.4%	1,650	3,555	115.5%	2,819	3,567	3,594	2,063	2,222
Totals	**22,807**	**29,459**	**29.2%**	**22,016**	**18,613**	**-15.5%**	**18,844**	**18,367**	**-2.5%**	**17,593**	**19,941**	**13.3%**	**17,888**	**20,205**	**13.0%**	**19,049**	**20,451**	**20,735**	**19,415**	**19,977**
Capital Contributions	(6,372)	(12,636)	98.3%	(2,352)	(4,579)	94.7%	(1,902)	(2,969)	56.1%	(1,902)	(2,111)	11.0%	(1,902)	(2,066)	8.6%	(2,642)	(2,710)	(2,764)	(2,819)	(2,876)
Net Capital Expenditures	**16,435**	**16,823**	**2.4%**	**19,664**	**14,034**	**-29%**	**16,942**	**15,398**	**-9.1%**	**15,691**	**17,830**	**13.6%**	**15,986**	**18,139**	**13.5%**	**16,407**	**17,741**	**17,971**	**16,596**	**17,101**
Change in CWIP	-	2,108		-	1,858		-	1,171		-	(290)		-	1,006		227	-	-	-	-
Net Additions	**16,435**	**18,931**		**19,664**	**15,892**		**16,942**	**16,569**		**15,691**	**17,540**		**15,986**	**19,145**		**16,634**	**17,741**	**17,971**	**16,596**	**17,101**
Total O&M	**7,548**	**7,363**			**7,558**			**7,985**			**7,767**			**7,907**		**8,214**	**8,378**	**8,546**	**8,717**	**8,891**

Variance of Year over Year Category Spending

An analysis of year over year trending for historical costs within the DSP categories is as follows.

2016 Actual vs. 2016 Board Approved

Table 2-31 2016 Actual vs. 2016 Board Approved (in ‘000s)

OEB Investment Category	2016 Board Approved	2016 Actual	Variance from 2016 Board Approved
System Access	11,172	17,628	6,456
System Renewal	7,360	7,801	441
System Service	2,406	1,742	(664)
General Plant	1,869	2,288	419
Totals	**22,807**	**29,459**	**6,652**
Capital Contributions	(6,372)	(12,636)	(6,264)
Net Capital Expenditures	**16,435**	**16,823**	**388**

From 2016 Board Approved to 2016 Actual overall gross CAPEX increased by 29.2% and net CAPEX increased 2.4%. Both increases were for the most part due to the change in scope of the LRT project. Most of the increase in System Access that related to LRT was offset by the increase in Capital Contribution received for the project.

System Access (SA)

2016 SA expenditures were abnormally high due the LRT project and much higher than planned due to scoping changes outside of the control of WNH ($3.7M). Correspondingly the capital contributions associated with this work were also higher. WNH deferred other CAPEX planned for 2016 in order to meet the mandated timelines of the LRT project. Additional details on SA project variances are included in section 4.3.4 of the DSP.

System Renewal (SR)

There were several adjustments made to plans in 2016 to work around the LRT project, scope changes by the Region of Waterloo and changes to asset conditions. These changes are outlined in section 4.3.4 of the DSP. Also there was an increase in expenditures driven by ice and wind storms. Adverse weather events in 2016 numbered 69 events and accounted for 58% of the total C.M.I. This was the worst year over the historical period for adverse weather events.

System Service (SS)

The decrease of $526K was due to an intentional deferral of two projects to meet mandated timelines of the LRT project and help pace capital expenditures.

General Plant (GP)

The main increase to GP resulted from environmental remediation work for 8 former municipal transformer station sites originally planned for 2017 brought forward into 2016 ($488K). Work on various sites had started in 2014 and progressed into 2015. As the LRT work increased WNH looked for opportunities to defer work into 2017. As the scope of the environmental work increased during the latter part of 2015, it was no longer considered prudent to defer the work into 2017 and leave the sites unfinished. There was also the risk that the delay in the applications to the Ministry of the Environment and Climate Change would require rework and added cost.

Capital Contributions (CC)

CC were increased by 98% related to scope changes for the LRT project. The increase in costs were substantially covered through CC and therefore limited impact to rate base for the scope changes.

2017 Actual vs. 2016 Actual

Table 2-32 2017 Actual vs. 2016 Actual (in ‘000s)

OEB Investment Category	2016 Actual	2017 Actual	Variance from 2016 Actual
System Access	17,628	6,299	(11,329)
System Renewal	7,801	9,482	1,681
System Service	1,742	567	(1,175)
General Plant	2,288	2,265	(23)
Totals	**29,459**	**18,613**	**(10,846)**
Capital Contributions	(12,636)	(4,579)	8,057
Net Capital Expenditures	**16,823**	**14,034**	**(2,789)**

From 2016-2017, overall gross CAPEX decreased by 36.8% and net CAPEX decreased 16.6%. Both decreases in 2017 were, for the most part due to the completion of the LRT project and a return to a more normalized work program. WNH had negotiated a relatively high rate of recovery (72%) for capital expenditures for the LRT project. In 2016, and to a lesser extent in 2017, contributed capital was significantly elevated over normal SA project levels. Capital expenditures did not have a material impact on O&M costs.

System Access (SA)

2016 SA expenditures were abnormally high due the LRT project. Correspondingly the capital contributions associated with this work were also higher. WNH deferred other CAPEX planned for 2016 in order to meet the mandated timelines of the LRT project. The expenditure decrease observed in 2017 was for the most part due to a return to a more normalized work program.

System Renewal (SR)

The increase in 2017 SR projects was an effort to catch up on work that had been deferred from 2015 and 2016 due to the LRT.

System Service (SS)

WNH deferred some 2017 SS projects into 2018 in an effort to catch up on higher priority SR work that had been deferred from 2015 and 2016 due to the demands of the LRT project.

General Plant (GP)

GP spending levels in 2017 were in line with 2016 expenditures.

Capital Contributions (CC)

Capital contributions were substantially decreased due to the nearing completion of the LRT project. CC continued to be higher in 2017 than normal levels.

2018 Actual vs. 2017 Actual

Table 2-33 2018 Actual vs. 2017 Actual (in '000s)

OEB Investment Category	2017 Actual	2018 Actual	Variance from 2017 Actual
System Access	6,299	6,091	(208)
System Renewal	9,482	8,424	(1,058)
System Service	567	1,822	1,255
General Plant	2,265	2,030	(235)
Totals	**18,613**	**18,367**	**(246)**
Capital Contributions	(4,579)	(2,969)	1,610
Net Capital Expenditures	**14,034**	**15,398**	**1,364**

Overall gross CAPEX decreased 1.3% however capital contributions decreased by 35.2% resulting in an increase in net CAPEX of 9.7%. Capital contribution levels in 2018 returned to more historic levels. Capital expenditures did not have a material impact on O&M costs.

System Access (SA)

SA expenditures in 2018 were slightly below those in 2017 mainly due to fewer customer connections.

System Renewal (SR)

The decrease in 2018 SR expenditures was due to pacing of the 4 kV line renewal expenditures over the last two years of the program. The program was completed at the end of 2019.

System Service (SS)

SS investments deferred from previous years due to the LRT project were completed in 2018. This included expenditures in Grid Modernization and a Contingency Enhancement project (tie line between feeders) both deferred from 2016.

General Plant (GP)

GP spending levels in 2018 were lower due to decreased expenditures in new Information Technology systems.

Capital Contributions (CC)

CC was higher in 2017 due to the completion of the LRT project. In 2018 CC returned to normal levels.

2019 Actual vs. 2018 Actual

Table 2-34 2019 Actual vs. 2018 Actual (in '000s)

OEB Investment Category	2018 Actual	2019 Actual	Variance from 2018 Actual
System Access	6,091	6,243	152
System Renewal	8,424	9,439	1,015
System Service	1,822	2,449	627
General Plant	2,030	1,810	(220)
Totals	**18,367**	**19,941**	**1,574**
Capital Contributions	(2,969)	(2,111)	858
Net Capital Expenditures	**15,398**	**17,830**	**2,432**

Overall gross CAPEX increased 8.6%. Capital contributions declined resulting in an increase in net CAPEX of 15.8%. Capital expenditures did not have a material impact on O&M costs.

System Access (SA)

Variance is below materiality.

System Renewal (SR)

The 2019 increase in expenditures was in part due to a major renewal of overhead lines emanating from the Scheifele Transformer Station. The project involved live line relocation of multi-circuit lines while also maintaining sufficient circuit capacity out of the station. The project took longer than expected. WNH also found through inspection, segments of rural line with failing conductor that were prioritized for replacement due to safety concerns.

System Service (SS)

The increase in expenditures was due to two projects. One was a contingency enhancement project ($373K) that had been deferred since 2015 due to delays by the Region of Waterloo in completing the required road works project. The other was a grid modernization project, SCADA FLISR project ($184K) initiated to improve WNH's reliability.

General Plant (GP)

Fleet expenditures were lower by ($190K) due to the deferral of a vehicle purchase.

Capital Contributions (CC)

After the completion of the LRT project there was a portion of funds that were over contributed by the Region of Waterloo for paying more than their share of joint use trenching. This was settled through the audit of the project and reduced the 2019 CC amount.

2020 Bridge Year vs. 2019 Actual

Table 2-35 2020 Bridge Year vs. 2019 Actual (‘000s)

OEB Investment Category	2019 Actual	2020 Bridge	Variance from 2019 Actual
System Access	6,243	5,839	(404)
System Renewal	9,439	8,612	(827)
System Service	2,449	2,199	(250)
General Plant	1,810	3,555	1,745
Totals	**19,941**	**20,205**	**264**
Capital Contributions	(2,111)	(2,066)	45
Net Capital Expenditures	**17,830**	**18,139**	**309**

Overall gross CAPEX is expected to increase by 1.3%. Capital contributions are expected to decrease 2.1% resulting in an increase in net CAPEX of 1.7%. Capital expenditures did not have a material impact on O&M costs.

System Access (SA)

Decrease in SA expenditures is expected due to a decrease in customer driven work, namely connections and line expansions.

System Renewal (SR)

2020 SR expenditures are lower due to WNH completing its 4 kV line renewal program in 2019.

System Service (SS)

SS expenditures in 2019 were higher than normal due to two projects provided in the 2019-2020 variance analysis. The reduction in expenditure in 2020 was mainly due to the completion of a contingency enhancement project.

General Plant (GP)

Historical GP expenditures averaged $2.39 million annually. GP expenditures in 2020 are $3.55 million, an increase of $1.74 million (96%) over 2019.
The increases occur in three areas;

1. $747K increase in Information Technology System changes and Improvements.
   a) In response to customer feedback received in 2019, WNH adjusted the direction of Information Technology capital investments to align to what customers stated they value most. The adjustments made include:
      An increase in capital spending towards customer facing systems by $134K in 2020 for the implementation of additional communications requested by customers including:
      i) outage notifications;
      ii) pro-active high bill alerts;
      iii) payment reminders; and
      iv) campaigns around electrical safety.
   b) An increase of $321K for CIS enhancements (Customer requested features)
      i) E-Billing;
      ii) Consolidated / summary billing for commercial customers;
      iii) Self-service online tools (interactive website, online chat, comparing usage within a customer's area).
   c) Vendor mandated Smart Meter System (RNI4.X) upgrade. ($192K)
   d) New WNH website with enhanced customer features. ($71K).

2. Increase in MS/DS disposal costs. ($574K)

   WNH retired from service the last five of its 4.16 kV municipal transformer stations and two of its 8.32 kV transformer stations. One more 8.32 kV transformer station is planned for retirement by the end of 2020. WNH is currently in a process to determine the best use for the sites and expects to move forward in 2020 with structure demolition, environmental remediation and disposal.

3. $354K increase in Fleet expenditures

   Fleet expenditures have historically averaged $760,000 annually (2010 – 2018). WNH attempts to pace these investments as much as possible. Expenditures in 2019 were well below this average at $369,000. Although expected 2020 expenditures are materially higher than 2019, they still remain below the historical average.

Capital Contributions (CC)

Variance is below materiality.

2021 Test Year vs. 2020 Bridge Year

Table 2-36 2021 Test Year vs. 2020 Bridge Year ('000s)

OEB Investment Category	2020 Bridge	2021 Test	Variance from 2020 Bridge
System Access	5,839	5,840	1
System Renewal	8,612	8,096	(516)
System Service	2,199	2,294	95
General Plant	3,555	2,819	(736)
Totals	**20,205**	**19,049**	**(1,156)**
Capital Contributions	(2,066)	(2,642)	(576)
Net Capital Expenditures	**18,139**	**16,407**	**(1,732)**

WNH is planning a reduction in 2021 capital expenditures of $1.16 million (5.7%) over 2020. 2021 capital expenditures are also $233K below the 2017–2020 annual average.

System Access (SA)

There is no material variance in expenditures between 2020 and 2021.

System Renewal (SR)

For 2021, Station Equipment Renewal (-$372K) accounts for the majority of the reduction. There are also smaller reductions in Proactive and Reactive renewal expenditures forecast for 2021.

System Service (SS)

There is no material variance in expenditures between 2020 and 2021.

General Plant (GP)

For 2021, a material reduction in Information Technology investments (-$749K) accounts for the reduction.

Capital Contribution (CC)

In 2021 there are three larger projects planned that have caused an increase between 2020 and 2021. Two of the projects are road relocations at the request of the road authority which are changing from overhead to underground. When there is a request/requirement from the road authority that WNH goes underground as part of the rebuild the requesting party funds the cost difference between the overhead and underground systems, in turn making their capital contribution higher. The third project is service for new commercial development.

Capital Project Summary

Table 2-37 provides a summary of all capital projects for the years 2016 through 2019 Actual, the 2020 Bridge Year and the 2021 Test Year. All projects above WNH's materiality threshold of $190,000 have been listed individually within the DSP categories and all individual projects below the threshold have been grouped together as miscellaneous within the applicable category. WNH's DSP, found in Attachment 2-2, provides capital project summaries that provide a full description and justification of all individual material projects listed in Table 2-37 for the 2021 Test Year. These summaries are found in Appendix G of Attachment 2-2. Table 2-37 is consistent with the Board's Appendix 2-AA, Capital Projects Table and, when Contributed Capital is removed, reconciles to Table 2-30 above.

Table 2-37 Summary of Capital Projects (Appendix 2-AA)

Projects	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
Reporting Basis	***MIFRS***	***MIFRS***	***MIFRS***	***MIFRS***	***MIFRS***	***MIFRS***
System Access						
Non-PSWHA Relocations	10,867,476	1,268,988	466,519	159,113	117,212	424,053
PSWHA Relocations	1,597,270	512,165	1,888,798	517,782	1,411,093	919,660
Customer Connections	3,165,292	2,249,709	2,020,785	2,983,265	2,450,707	2,168,379
Expansions (Subdivisions)	967,227	1,015,261	924,406	782,768	644,645	1,081,946
Expansions (Lines)	313,048	663,572	160,030	943,375	458,889	470,395
Retail Meters	464,804	590,504	621,715	760,887	707,852	664,599
Miscellaneous/Other	253,047	(1,924)	4,703	17,077	48,761	111,230
Sub-Total	**17,628,164**	**6,298,275**	**6,086,956**	**6,164,267**	**5,839,159**	**5,840,262**
System Renewal						
Overhead Line Renewal	179,585	608,222	514,169	1,117,214	235,928	3,181,346
Underground Line Renewal	1,536,029	1,602,516	1,615,007	1,873,000	1,770,943	1,435,447
Overhead Line Renewal - Failing Conductor	30,618	405,673	312,801	647,791	1,245,812	853,987
Overhead Line Renewal (8kV)	1,514,370	1,527,537	2,148,877	1,970,758	3,252,494	703,076
Overhead Line Renewal (4kV)	2,567,067	3,090,030	1,831,507	1,621,924	-	-
Reactive Renewal	716,750	426,202	364,105	335,469	304,485	286,140
Proactive Renewal	681,056	664,943	882,231	913,294	843,109	752,106
Station Equipment Renewal	160,631	816,425	391,418	438,142	497,041	125,503
Miscellaneous/Other	415,072	340,351	356,712	444,514	462,264	758,164
Sub-Total	**7,801,178**	**9,481,899**	**8,416,827**	**9,362,106**	**8,612,076**	**8,095,769**
System Service						
Contingency Enhancement	282,615	275,248	607,147	1,133,913	615,740	291,280
Grid Modernization	1,133,013	125,488	758,099	909,408	856,313	909,220
Grid Resiliency	-	-	-	-	-	200,000
Stations Equipment Upgrades	46,760	138,426	234,815	239,219	442,961	406,567
Miscellaneous/Other	279,679	27,909	233,617	322,035	283,977	486,538
Sub-Total	**1,742,067**	**567,071**	**1,833,678**	**2,604,575**	**2,198,991**	**2,293,605**
General Plant						
Fleet - Trucks	406,938	604,043	523,423	331,589	666,740	735,187
IT Asset Lifecycle	111,028	200,116	212,975	198,469	323,891	327,946
IT System Changes and Improvements	73,514	48,901	194,302	136,405	856,410	71,819
IT New Systems and Services	697,082	776,974	155,355	272,793	204,708	169,479
OT Software	76,913	186,511	285,789	305,680	251,346	281,522
Building & Furniture Improvements	175,148	240,318	248,039	215,018	299,600	250,700
MS/DS Decommissioning	488,315	43,546	16,923	96,624	673,544	462,762
Miscellaneous/Other	259,266	164,262	393,334	253,650	278,340	519,461
Sub-Total	**2,288,204**	**2,264,671**	**2,030,140**	**1,810,228**	**3,554,579**	**2,818,876**
Total	**29,459,613**	**18,611,916**	**18,367,601**	**19,941,176**	**20,204,805**	**19,048,512**
Less Renewable Generation Facility Assets and Other Non-Rate-Regulated Utility Assets (input as negative)	(488,315)	(43,546)	(16,923)	(96,624)	(673,544)	(462,762)
Total	**28,971,298**	**18,568,370**	**18,350,678**	**19,844,552**	**19,531,261**	**18,585,750**

2.2.2.3 POLICY OPTIONS FOR THE FUNDING OF CAPITAL

WNH has not used either the ICM or ACM for incremental capital investments as WNH attempts to pace and prioritize projects year to year to limit rate impact fluctuations to customers.

2.2.2.4 ADDITION OF PREVIOUSLY APPROVED ACM AND ICM PROJECT ASSETS TO RATE BASE

WNH does not have any previously approved ACM or ICM Projects and therefore has nothing to add to rate base for this section.

2.2.2.5 CAPITALIZATION POLICY

WNH's current capitalization policies and principles are based on IFRS and guidelines set out by the Ontario Energy Board, where applicable. WNH converted to IFRS January 1, 2015 and as such the capitalization policy is in effect for all of the historical and forecast years in this Application. WNH's external auditors have also deemed WNH's capitalization policy, including the overhead policy, to align with IFRS standards. There have been no changes to the capitalization policy since WNH's last COS.

PP&E include expenditures that are directly attributable to the acquisition of the asset. The cost of self-constructed assets includes the cost of materials, direct labour and other costs directly attributable to bringing the asset to a working condition for its intended use.

Assets with a cost in excess of $1,000 are expected to provide future economic benefit greater than one year will be capitalized. Expenditures that create a physical betterment or improvement of an asset will be capitalized.

Guidelines for Capitalization

Capital Assets include property, plant, and equipment that are held for use in the production or supply of goods and services and provide a benefit lasting beyond one year. Capital expenditures also include the improvement or "betterment" of existing assets.

Intangible assets are also considered capital assets and are defined as assets that lack physical substance. They include goodwill, patents, copyrights and computer software.

Betterment – a “betterment” is a cost which enhances the service potential of a capital asset and/or increases its value, and is therefore capitalized. A betterment includes expenditures which increase the capacity of the asset, lower associated operating costs of the asset, improve the quality of output or extend the asset’s useful life. A betterment does not include general maintenance-related actions that seek to sustain an asset's current value.

Repairs - a repair is a cost incurred to maintain the service potential of a capital asset. Expenditures for repairs are expensed to the current operating period. Expenditures for repairs and/or maintenance designed to maintain an asset in its original state are not capital expenditures and are charged to an operating account.

Capitalization by Component

When parts or components of an item of property, plant and equipment have different useful lives, they are accounted for as individual items (major components) of property, plant and equipment. Component costs must be significant in relation to the total cost of the item and depreciated separately over the component’s useful life. Components are those which: a) are significant in relation to the total cost of the item and b) have different depreciation methods or useful life.

Components with similar useful lives and depreciation methods are grouped in determining the depreciation charge. Parts of the item that are not individually significant (remainder of the items) are combined and categorized as a single component best suited for the sum of the parts.

Depreciation

Depreciation is recognized on a straight-line basis over the estimated useful life of each significant identifiable component of an item of property, plant and equipment. Land and Land Rights are not depreciated. Construction in progress assets are not depreciated until the project is complete and in service.

2.2.2.6 CAPITALIZATION OF OVERHEAD

WNH's overhead policy has been reviewed by its external auditors and has been deemed IFRS compliant. There have been no changes to the overhead policy since WNH's last COS.

Included in WNH's labour costs are those costs that are generally considered labour 'burden'. WNH's burden costs include vacation, statutory holidays, sick time, CPP, EI, OMERS contributions, health care and other employee benefits. Burden rates are forecasted by individual employee and are set-up in WNH's payroll system accordingly. Through the timesheet process, employees track their hours by work order or account number which designates whether the work is expensed or capitalized. Labour costs, including burden, are then directly charged to a specific project by employee based on the work executed in the field.

Service Centre - the costs to operate the building are charged out to the various functional departments based on the square footage of each department. Costs are allocated to Administration, Finance, Regulatory, CDM, Customer Service, Billing & Collections, IT, Engineering, Stations, Metering, Operations Administration, Operations-Line Department, Health & Safety, System Control, Stores, and Fleet.

Stores, Inventory and Purchasing – the costs of this function are related to the labour associated with employees issuing material and depreciation on Stores Equipment. As part of the budget process various departments determine the material that is forecasted to flow though the warehouse to capital projects and O&M. A rate is determined by Finance as a % of allowed labour cost and depreciation expense. This rate is applied directly to the materials issued by Stores to a specific capital or O&M work order through the automated inventory and work order system.

Fleet Costs - these costs include costs associated with maintaining WNH's fleet of pick-up trucks, bucket trucks with aerial devices, radial boom derrick trucks and trailers. These costs include fuel costs, repairs, parts, insurance, depreciation and all other items of expense necessary to keep the fleet in service and allowed to be recovered under IFRS. A fleet rate is determined on an annual basis for each vehicle group by using the hours determined in the budget process and allocation of the estimated budgeted allowable fleet costs. When a vehicle is used for a capital project, a fleet rate is charged based on the type of vehicle used multiplied by hourly usage of the vehicle. These costs are expensed or capitalized directly to the specific project through the timesheet process by work order.

Engineering & Operations Administration – Employees allocate their time directly to O&M and capital through the time sheet process by work order. Labour costs associated with capital must be directly attributable to a specific capital project. Recovery of Engineering & Plant Services (EPS) and Operations Administration are no longer part of burden accounts and subsequently not part of capital cost.

General Administration – WNH does not capitalize general administrative costs related to Administration or Finance.

Capitalization of Overhead

Table 2-38 provided below, which is consistent with Board Appendix 2-D, has been completed to show WNH's OM&A costs prior to, and after, the allocation of costs for the Fleet, Inventory (Stores) and Employee Benefits to capital construction projects.

Table 2-38 – Overhead Expense

Appendix 2-D
Overhead Expense

Applicants are to provide a breakdown of OM&A before capitalization in the below table. OM&A before capitalization may be broken down by cost center, program, drivers or another format best suited to focus on capitalized vs. uncapitalized OM&A.

OM&A Before Capitalization -	2016 Historical Year	2017 Historical Year	2018 Historical Year	2019 Historical Year	2020 Bridge Year	2021 Test Year
Distribution Expenses - Operation & Maintenance	$ 10,318,101	$ 10,378,566	$ 10,498,644	$ 10,409,671	$ 10,487,222	$ 10,857,287
Billing and Collecting	$ 2,728,245	$ 2,823,342	$ 3,100,765	$ 2,966,160	$ 3,008,184	$ 3,137,007
Community Relations	$ 104,616	$ 129,492	$ 200,330	$ 244,189	$ 347,738	$ 508,564
Administrative and General Expenses	$ 2,584,121	$ 3,054,727	$ 3,222,494	$ 3,482,548	$ 3,778,758	$ 3,869,654
Total OM&A Before Capitalization (B)	**$ 15,735,083**	**$ 16,386,127**	**$ 17,022,233**	**$ 17,102,568**	**$ 17,621,902**	**$ 18,372,512**

Please note that any overhead costs expensed are included in their functional OM&A area above

Applicants are to provide a breakdown of capitalized OM&A in the below table. Capitalized OM&A may be broken down using the categories listed in the table below if possible. Otherwise, applicants are to provide its own break down of capitalized OM&A.

Capitalized OM&A	2016 Historical Year	2017 Historical Year	2018 Historical Year	2019 Historical Year	2020 Bridge Year	20201 Test Year	Directly Attributable? (Y/N)	Explanation for Change in Overhead Capitalized
employee benefits	$ 1,592,811	$ 1,489,559	$ 1,410,750	$ 1,476,295	$ 1,332,880	$ 1,419,210	Y	Directly attributable to labour costs charged to capital
costs of site preparation								
initial delivery and handling costs	$ 155,683	$ 153,818	$ 146,601	$ 152,638	$ 148,000	$ 129,000	Y	Directly attributable to labour & equipment costs charged to capital
costs of testing whether the asset is functioning properly								
professional fees								
fleet costs	$ 1,206,787	$ 1,176,881	$ 956,176	$ 1,014,035	$ 1,099,293	$ 1,095,245	Y	Directly attributable to labour & equipment costs charged to capital
costs of opening a new facility								
costs of introducing a new product or service (including costs of advertising and promotional activities)								
costs of conducting business in a new location or with a new class of customer (including costs of staff training)								
administration and other general overhead costs								
Total Capitalized OM&A (A)	**$ 2,955,281**	**$ 2,820,258**	**$ 2,513,527**	**$ 2,642,968**	**$ 2,580,173**	**$ 2,643,455**		
% of Capitalized OM&A (=A/B)	19%	17%	15%	15%	15%	14%		

OM&A After Capitalization -	2016 Historical Year	2017 Historical Year	2018 Historical Year	2019 Historical Year	2020 Bridge Year	2021 Test Year
Distribution Expenses	$ 7,362,820	$ 7,558,307	$ 7,985,117	$ 7,766,704	$ 7,907,049	$ 8,213,832
Billing and Collecting	$ 2,728,245	$ 2,823,342	$ 3,100,765	$ 2,966,160	$ 3,008,184	$ 3,137,007
Community Relations	$ 104,616	$ 129,492	$ 200,330	$ 244,189	$ 347,738	$ 508,564
Administrative and General Expenses	$ 2,584,121	$ 3,054,727	$ 3,223,637	$ 3,482,548	$ 3,778,758	$ 3,869,654
Total OM&A After Capitalization (C) = A - B	**$ 12,779,802**	**$ 13,565,868**	**$ 14,509,849**	**$ 14,459,601**	**$ 15,041,729**	**$ 15,729,057**

Burden Rates

Table 2-39 below summarizes the historical and forecasted overhead rates related to the capitalization of costs on self-constructed assets. The rates are changed and updated periodically to reflect actual costs or changed circumstances.

WNH has two types of overhead costs that are capitalized; (i) Fleet and (ii) Stores. WNH also capitalizes payroll benefits for applicable employees; however, these costs are directly allocated to capital through a burden rate in the payroll system. WNH has budgeted payroll benefits and a resulting overhead percentage and these are attached to the employee within the payroll system. Thus, the benefits are attached to each employee hour and directly charged to Capital, OM&A or recoverable as applicable.

WNH does not allocate any indirect operating costs associated with Finance, Information Systems Technology, or the Administration department to capital.

Table 2-39 – Overhead Rates

Description	Unit	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test
Burden Rates							
Payroll Benefits	Direct Labour	50.76%	51.80%	53.62%	53.70%	52.75%	52.08%
PP&E [1]	Direct Labour	2.20%	2.07%	2.34%	2.58%	2.17%	2.05%
Overhead Rates							
Engineering	Direct Labour	9.0%	9.0%	9.0%	9.0%	9.0%	9.0%
Operations Adminstration	Direct Labour	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Stores	Material $	2.0%	2.5%	2.5%	2.5%	2.5%	2.5%
Loss Control - Inside	Direct Labour	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Loss Control - Outside	Direct Labour	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Vehicle Rates							
Tension Stringer and puller	Direct Equipment Hour	$ 94	$ 94	$ 100	$ 100	$ 100	$ 100
Small Vehicle	Direct Equipment Hour	$ 12	$ 15	$ 20	$ 20	$ 20	$ 20
Medium Truck	Direct Equipment Hour	-	$ 30	$ 40	40	40	$ 40
Large Truck	Direct Equipment Hour	$ 44	$ 44	$ 55	$ 55	$ 55	$ 55
Other							
Administration Charge[2]	$	15%	15%	15%	15%	15%	15%

[1] Personal Protective Equipment only attached to outside personnel hours

2 WNH charges a 15% Administration Fee on all Billable Work, this income is recorded in USoA # 5625

2.2.2.7 COSTS OF ELIGIBLE INVESTMENTS FOR THE CONNECTION OF QUALIFYING GENERATION FACILITIES

As noted in the Filing Requirements under section 2.2.2.7 "For any costs incurred to make investments that are eligible for rate protection as described in section 79.1 of the Ontario Energy Board Act, 1998 (OEB Act) and O.Reg. 330/09 under the OEB Act, including any facilities forecast to enter service beyond the test year, the distributor may seek approval to recover the rate protection component of the costs."

WNH has not identified any material eligible investments for which rate protection is required. As such WNH has not completed Appendices 2-FA through 2-FC.

2.2.2.8 SERVICE QUALITY

WNH records the following Service Reliability Indices:
SAIDI = Total Customer Hours of Interruptions / Total Customers Served
SAIFI = Total Customer Interruptions / Total Customers Served

These indices are reported to the OEB through the RRR reporting requirements (RRR section 2.1.4.2.1 and 2.1.4.2.2). These indices provide WNH with annual measures of its service performance that are used for internal benchmarking purposes when making comparison with other distributors as well as against itself and past history. WNH follows the Board's Reporting and Record Keeping Requirements Guidance to reports its service quality indicators annual.

In accordance with the Filing Requirements, Tables 2-40 and 2-41 are provided below and are consistent with Chapter 2 Filing Requirements Appendix 2-G – Service Quality Indicators and the OEB Scorecard. Chapter 2 Filing Requirements Appendix 2-G is attached in Attachment 2-1. The Table provides the performance measurements for the last five historical years – 2015 through 2019.

Table 2-40 Service Quality (Appendix 2-G)

Indicator	OEB Minimum Standard	2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019 Actual
Low Voltage Connections	90.0%	100.0%	100.0%	100.0%	100.0%	100.0%
High Voltage Connections	90.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Telephone Accessibility	65.0%	88.1%	86.7%	72.8%	92.7%	90.7%
Appointments Met	90.0%	100.0%	98.1%	96.4%	99.3%	98.6%
Written Response to Enquires	80.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Emergency Urban Response	80.0%	100.0%	100.0%	96.6%	94.9%	92.1%
Emergency Rural Response	80.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Telephone Call Abandon Rate	10.0%	4.1%	4.6%	3.7%	1.0%	0.6%
Appointment Scheduling	90.0%	99.6%	99.9%	99.6%	99.8%	84.4%
Rescheduling a Missed Appointment	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Reconnection Performance Standard	85.0%	100.0%	100.0%	100.0%	100.0%	100.0%

WNH's performance results over the 2015 to 2019 period meet or exceed the Board approved standards with the exception of 2019's Appointment Scheduling. All other indicators are within the range of acceptable performance over the period five years and no corrective action is required. 2019's Appointment Scheduling was missed due to outsourcing customer locates in 2019 in an attempt to decrease operating costs. The service provider was not able to keep up with 2019's summer demand. WNH has confirmed with the service provider that they will increase staffing in 2020 and WNH does not anticipate that this requirement will be missed in 2020 and future years.

Table 2-41 SAIDI and SAIFI Results (Appendix 2-G)

	2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019 Actual	5 Year Avg.
SAIDI	1.053	2.867	0.863	2.086	1.126	1.599
SAIFI	1.787	2.986	1.612	1.862	1.839	2.017

Including outages caused by loss of supply

	2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019 Actual	5 Year Avg.
SAIDI	0.893	2.601	0.860	1.833	1.079	1.453
SAIFI	1.593	2.624	1.582	1.645	1.443	1.777

Excluding outages caused by loss of supply

	2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019 Actual	5 Year Avg.
SAIDI	0.688	0.709	0.761	0.918	0.850	0.785
SAIFI	1.436	1.145	1.497	1.318	1.287	1.337

Excluding outages caused by loss of supply and major event days

According to the 2018 Yearbook of Distributors, the Industry average SAIDI unadjusted was 9.25 and adjusted 2.59. The Industry average SAIFI unadjusted was 2.65 and adjusted was 1.48. WNH has exceeded all industry averages.

Refer to Section 2.3.3.2 of the Distribution System Plan for a detailed discussion with respect to System Reliability.

Table 2-42 provides a summary of Major Events that have occurred over the past five years.

1 **Table 2-42 Major Events**

Reporting Year	Cause Code	Number of Interruptions	Number of Customer Interruptions	Number of Hours of Customer Interruptions
2015	Equipment Failure	5	7,167	10,871
2015	Loss of Supply	9	7,060	8,890
2016	Adverse Weather	67	89,681	107,333
2016	Lightning	15	4,092	4,158
2016	Lightning	6	3,966	7,097
2017	Tree Contacts	5	4,788	5,571
2018	Adverse Weather	3	8,711	10,529
2018	Adverse Weather	15	16,623	55,867
2019	Adverse Weather	15	10,998	13,313

Waterloo North Hydro

ATTACHMENT 2-1

REQUIRED OEB APPENDICES

Appendix 2-AA
Capital Projects Table

Projects	2016	2017	2018	2019	2020 Bridge Year	2021 Test Year
Reporting Basis	**MIFRS**	**MIFRS**	**MIFRS**	**MIFRS**	**MIFRS**	**MIFRS**
System Renewal						
Overhead Line Renewal	179,585	608,222	514,169	1,117,214	235,928	3,181,346
Underground Line Renewal	1,536,029	1,602,516	1,615,007	1,873,000	1,770,943	1,435,447
Overhead Line Renewal - Failing Cor	30,618	405,673	312,801	647,791	1,245,812	853,987
Overhead Line Renewal (8kV)	1,514,370	1,527,537	2,148,877	1,970,758	3,252,494	703,076
Overhead Line Renewal (4kV)	2,567,067	3,090,030	1,831,507	1,621,924	0	0
Reactive Renewal	716,750	426,202	364,105	335,469	304,485	286,140
Proactive Renewal	681,056	664,943	882,231	913,294	843,109	752,106
Station Equipment Renewal	160,631	816,425	391,418	438,142	497,041	125,503
Miscellaneous/Other	415,072	340,351	356,712	444,514	462,264	758,164
Sub-Total	7,801,178	9,481,899	8,416,827	9,362,106	8,612,076	8,095,769
System Access						
Non-PSWHA Relocations	10,867,476	1,268,988	466,519	159,113	117,212	424,053
PSWHA Relocations	1,597,270	512,165	1,888,798	517,782	1,411,093	919,660
Customer Connections	3,165,292	2,249,709	2,020,785	2,983,265	2,450,707	2,168,379
Expansions (Subdivisions)	967,227	1,015,261	924,406	782,768	644,645	1,081,946
Expansions (Lines)	313,048	663,572	160,030	943,375	458,889	470,395
Retail Meters	464,804	590,504	621,715	760,887	707,852	664,599
Miscellaneous/Other	253,047	-1,924	4,703	17,077	48,761	111,230
Sub-Total	17,628,164	6,298,275	6,086,956	6,164,267	5,839,159	5,840,262
System Service						
Contingency Enhancement	282,615	275,248	607,147	1,133,913	615,740	291,280
Grid Modernization	1,133,013	125,488	758,099	909,408	856,313	909,220
Grid Resiliency	0	0	0	0	0	200,000
Stations Equipment Upgrades	46,760	138,426	234,815	239,219	442,961	406,567
Miscellaneous/Other	279,679	27,909	233,617	322,035	283,977	486,538
Sub-Total	1,742,067	567,071	1,833,678	2,604,575	2,198,991	2,293,605
General Plant						
Fleet - Trucks	406,938	604,043	523,423	331,589	666,740	735,187
IT Asset Lifecycle	111,028	200,116	212,975	198,469	323,891	327,946
IT System Changes and Improvemen	73,514	48,901	194,302	136,405	856,410	71,819
IT New Systems and Services	697,082	776,974	155,355	272,793	204,708	169,479
OT Software	76,913	186,511	285,789	305,680	251,346	281,522
Building & Furniture Improvements	175,148	240,318	248,039	215,018	299,600	250,700
MS/DS Decommissioning	488,315	43,546	16,923	96,624	673,544	462,762
Miscellaneous/Other	259,266	164,262	393,334	253,650	278,340	519,461
Sub-Total	2,288,204	2,264,671	2,030,140	1,810,228	3,554,579	2,818,876
Miscellaneous						
Total	**29,459,613**	**18,611,916**	**18,367,601**	**19,941,176**	**20,204,805**	**19,048,512**
Less Renewable Generation Facility Assets and Other Non-Rate-Regulated Utility Assets ***(input as negative)***	-488,315	-43,546	-16,923	-96,624	-673,544	-462,762
Total	**28,971,298**	**18,568,370**	**18,350,678**	**19,844,552**	**19,531,261**	**18,585,750**

Notes:

1 Please provide a breakdown of the major components of each capital project undertaken in each year. Please ensure that all projects below the materiality threshold are included in the miscellaneous line. Add more projects as required.

2 The applicant should group projects appropriately and avoid presentations that result in classification of significant components of the capital budget in the miscellaneous category.

File Number:	EB-2020-0059
Exhibit:	2
Tab:	
Schedule:	Table 2-30
Page:	52
Date:	30-Jun-20

TO BE UPDATED AT THE DRAFT RATE ORDER STAGE

Appendix 2-AB

Table 2 - Capital Expenditure Summary from Chapter 5 Consolidated Distribution System Plan Filing Requirements

First year of Forecast Period:

2021

CATEGORY	Historical Period (previous plan[1] & actual)															Forecast Period (planned)				
	2016			2017			2018			2019			2020			2021	2022	2023	2024	2025
	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual[2]	Var					
	$ '000		%	$ '000		%	$ '000		%	$ '000		%	$ '000		%	$ '000				
System Access	11,172	17,628	57.8%	7,521	6,299	-16.3%	6,020	6,091	1.2%	5,947	6,243	5.0%	6,086	5,839	-4.1%	5,840	6,166	6,305	6,448	6,592
System Renewal	7,360	7,801	6.0%	10,001	9,482	-5.2%	9,438	8,424	-10.8%	8,801	9,439	7.2%	8,976	8,612	-4.1%	8,096	9,372	9,548	9,693	9,951
System Service	2,406	1,742	-27.6%	1,680	567	-66.3%	1,725	1,822	5.6%	1,175	2,449	108.4%	1,176	2,199	87.1%	2,294	1,346	1,288	1,211	1,212
General Plant	1,869	2,288	22.4%	2,814	2,265	-19.5%	1,661	2,030	22.2%	1,670	1,810	8.4%	1,650	3,555	115.5%	2,819	3,567	3,594	2,063	2,222
TOTAL EXPENDITURE	22,807	29,460	29.2%	22,016	18,612	-15.5%	18,845	18,368	-2.5%	17,593	19,941	13.3%	17,887	20,205	13.0%	19,049	20,452	20,736	19,415	19,977
Capital Contributions	- 6,372	- 12,636	98.3%	- 2,352	- 4,579	94.7%	- 1,902	- 2,969	56.1%	- 1,902	- 2,111	11.0%	- 1,902	- 2,066	8.6%	- 2,642	- 2,710	- 2,764	- 2,819	- 2,876
Net Capital Expenditures	16,434	16,823	2.4%	19,664	14,033	-28.6%	16,943	15,399	-9.1%	15,691	17,830	13.6%	15,985	18,139	13.5%	16,406	17,742	17,972	16,596	17,102
System O&M	$ 7,548	$ 7,363	-2.5%		$ 7,558	--		$ 7,985	--		$ 7,767	--		$ 7,907	--	$ 8,214	$ 8,378	$ 8,546	$ 8,717	$ 8,891

Notes to the Table:

1. Historical "previous plan" data is not required unless a plan has previously been filed. However, use the last OEB-approved, at least on a Total (Capital) Expenditure basis for the last cost of service rebasing year, and the applicant should include their planned budget in each subsequent historical year up to and including the Bridge Year.
2. Indicate the number of months of 'actual' data included in the last year of the Historical Period (normally a 'bridge' year):

Explanatory Notes on Variances (complete only if applicable)

Notes on shifts in forecast vs. historical budgets by category

Please refer to Exhibit 2 of the Application.

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

Please refer to Exhibit 2 of the Application.

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

Please refer to Exhibit 2 of the Application.

File Number:	EB-2020-0059
Exhibit:	2
Tab:	
Schedule:	Table 2-9 to 2-14
Page:	12 to 23
Date:	June 30, 2020

Appendix 2-BA
Fixed Asset Continuity Schedule [1]

Accounting Standard MIFRS
Year **2016**

			Cost				Accumulated Depreciation				
CCA Class [2]	**OEB Account [3]**	**Description [3]**	**Opening Balance**	**Additions [4]**	**Disposals [6]**	**Closing Balance**	**Opening Balance**	**Additions**	**Disposals [6]**	**Closing Balance**	**Net Book Value**
	1609	Capital Contributions Paid	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12	1611	Computer Software (Formally known as Account 1925)	$ 6,649,049	$ 194,925	-$ 6,542	$ 6,837,432	-$ 5,758,916	-$ 392,516	$ -	-$ 6,151,432	$ 686,000
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
CEC	1612	Land Rights (Formally known as Account 1906)	$ 758,776	$ 139,141	$ -	$ 897,918	$ -	$ -	$ -	$ -	$ 897,918
N/A	1805	Land	$ 2,323,796	$ -	-$ 15,204	$ 2,308,592	$ -	$ -	$ -	$ -	$ 2,308,592
47	1808	Buildings - MS	$ 399,158	$ 547,236	-$ 614,212	$ 332,181	-$ 241,878	-$ 6,219	$ 56,060	-$ 192,038	$ 140,143
47	1808	Buildings - TS	$ 4,327,244	$ 295,936	$ -	$ 4,623,179	-$ 1,055,614	-$ 73,813	$ -	-$ 1,129,427	$ 3,493,753
47	1808	Buildings & Fixtures - Service Centre	$ 20,263,861	$ 62,502	$ -	$ 20,326,363	-$ 1,606,241	-$ 399,944	$ -	-$ 2,006,186	$ 18,320,177
47	1808	Service Centre - Parking Lot & Fence	$ 788,824	$ 2,075	$ -	$ 790,899	-$ 114,503	-$ 33,359	$ -	-$ 147,861	$ 643,037
47	1808	Service Centre - HVAC	$ 3,916,531	$ 342,376	$ -	$ 4,258,907	-$ 953,778	-$ 315,248	$ -	-$ 1,269,025	$ 2,989,881
47	1808	Service Centre - Roof	$ 613,985	$ -	$ -	$ 613,985	-$ 113,209	-$ 33,345	$ -	-$ 146,554	$ 467,431
47	1808	Service Centre - Automation	$ 50,290	$ -	$ -	$ 50,290	-$ 10,840	-$ 3,481	$ -	-$ 14,321	$ 35,969
47	1808	Operation Centre - Workshop	$ 61,364	$ -	$ -	$ 61,364	-$ 56,491	-$ 150	$ -	-$ 56,641	$ 4,723
13	1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1815	Transformer Station Equipment >50 kV	$ 15,031,200	$ 125,072	$ -	$ 15,156,272	-$ 9,373,292	-$ 570,617	$ -	-$ 9,943,909	$ 5,212,363
47	1815	TSE Auxiliary equipment	$ 1,734,925	$ 103,572	$ -	$ 1,838,497	-$ 421,736	-$ 64,966	$ -	-$ 486,702	$ 1,351,795
47	1815	TSE - P&C equipment	$ 3,333,245	$ 36,460	$ -	$ 3,369,705	-$ 917,743	-$ 255,134	$ -	-$ 1,172,878	$ 2,196,827
47	1815	TSE - Power transformer	$ 12,341,512	$ -	$ -	$ 12,341,512	-$ 2,458,861	-$ 244,209	$ -	-$ 2,703,071	$ 9,638,442
47	1820	Distribution Station Equipment <50 kV	$ 5,597,083	$ -	-$ 473,548	$ 5,123,535	-$ 3,600,290	-$ 89,242	$ 444,084	-$ 3,245,448	$ 1,878,087
47	1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1830	Poles, Towers & Fixtures	$ 69,776,950	$ 5,079,266	$ -	$ 74,856,216	-$ 26,102,042	-$ 1,288,474	$ -	-$ 27,390,516	$ 47,465,700
47	1835	Overhead Conductors & Devices	$ 35,646,661	$ 2,709,950	$ -	$ 38,356,611	-$ 11,135,776	-$ 724,414	$ -	-$ 11,860,189	$ 26,496,421
47	1835	OH Manual line switches	$ 861,524	$ 219,182	$ -	$ 1,080,705	-$ 64,364	-$ 36,023	$ -	-$ 100,387	$ 980,318
47	1835	OH SCADA control equipment	$ 1,641,741	$ 783,924	$ -	$ 2,425,664	-$ 191,695	-$ 161,711	$ -	-$ 353,406	$ 2,072,258
47	1840	Underground Conduit	$ 18,659,277	$ 3,793,787	$ -	$ 22,453,063	-$ 8,416,805	-$ 326,226	$ -	-$ 8,743,031	$ 13,710,032
47	1845	Underground Conductors & Devices	$ 41,226,702	$ 11,761,670	$ 0	$ 52,988,372	-$ 20,029,493	-$ 1,192,967	$ -	-$ 21,222,460	$ 31,765,912
47	1850	Line Transformers - Overhead	$ 30,218,911	$ 1,347,429	-$ 199,035	$ 31,367,305	-$ 14,885,540	-$ 443,315	$ -	-$ 15,328,855	$ 16,038,450
47	1850	Line Transformers - Underground	$ 26,418,591	$ 1,686,704	-$ 41,033	$ 28,064,262	-$ 9,207,622	-$ 702,144	$ -	-$ 9,909,766	$ 18,154,497
47	1855	Services - Overhead	$ 10,000,235	$ 151,283	$ -	$ 10,151,518	-$ 5,148,398	-$ 139,545	$ -	-$ 5,287,942	$ 4,863,576
47	1855	Services - Underground	$ 16,554,336	$ 544,346	$ -	$ 17,098,682	-$ 7,634,290	-$ 230,732	$ -	-$ 7,865,022	$ 9,233,659
47	1860	Meters - Bidirectional	$ 35,896	$ -	$ -	$ 35,896	-$ 6,613	-$ 1,436	$ -	-$ 8,049	$ 27,847
47	1860	Meters - Commercial	$ 2,859,089	$ 791	-$ 791	$ 2,859,089	-$ 1,617,385	-$ 140,846	$ -	-$ 1,758,231	$ 1,100,858
47	1860	Meters - Residential	$ 1,142,342	$ 240,708	$ -	$ 1,383,050	-$ 178,874	-$ 82,372	$ -	-$ 261,245	$ 1,121,805
47	1860	Meters C& I	$ 1,064,326	$ 250,571	$ 791	$ 1,315,688	-$ 146,258	-$ 87,753	$ -	-$ 234,010	$ 1,081,677
47	1860	Meters (Smart Meters)	$ 7,709,608	$ -	$ -	$ 7,709,608	-$ 3,122,938	-$ 536,249	$ -	-$ 3,659,187	$ 4,050,421
47	1860	Meters (Wholesale)	$ 589,064	$ 113,659	$ -	$ 702,724	-$ 407,093	-$ 50,277	$ -	-$ 457,370	$ 245,354
N/A	1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (10 years)	$ 1,567,318	$ 16,709	$ -	$ 1,584,027	-$ 1,006,594	-$ 108,298	$ -	-$ 1,114,892	$ 469,134
8	1915	Office Furniture & Equipment (5 years)	$ 10,005	$ 7,510	$ -	$ 17,515	-$ 10,005	-$ 1,502	$ -	-$ 11,507	$ 6,008
10	1920	Computer Equipment - Hardware	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ 4,196,117	$ 140,467	$ 6,542	$ 4,343,126	-$ 3,909,627	-$ 146,296	$ -	-$ 4,055,923	$ 287,204
10	1930	Transportation Equipment - car	$ 37,162	$ -	$ -	$ 37,162	-$ 29,729	-$ 7,432	$ -	-$ 37,162	$ -
10	1930	Transportation Equipment - Other - trailers etc	$ 737,547	$ 60,735	$ -	$ 798,282	-$ 346,962	-$ 40,259	$ -	-$ 387,221	$ 411,061
10	1930	Transportation Equipment - small trucks	$ 1,650,798	$ 56,784	-$ 30,206	$ 1,677,376	-$ 1,201,896	-$ 135,638	$ 30,206	-$ 1,307,327	$ 370,049
10	1930	Transportation Equipment - workplatform	$ 6,438,668	$ 460,120	-$ 257,176	$ 6,641,612	-$ 3,739,329	-$ 367,292	$ 246,189	-$ 3,860,431	$ 2,781,181
10	1930	Transportation Equipment - Hybrid system	$ 325,429	$ -	-$ 73,455	$ 251,975	-$ 157,538	-$ 54,233	$ 44,073	-$ 167,699	$ 84,276
8	1935	Stores Equipment	$ 544,135	$ 111,785	$ -	$ 655,921	-$ 334,794	-$ 58,283	$ -	-$ 393,077	$ 262,844
8	1940	Tools, Shop & Garage Equipment	$ 320,661	$ 1,259	$ -	$ 321,919	-$ 199,479	-$ 35,109	$ -	-$ 234,588	$ 87,331
8	1940	Truck tools	$ 1,126,122	$ 56,954	$ -	$ 1,183,076	-$ 932,857	-$ 88,428	$ -	-$ 1,021,286	$ 161,790
8	1945	Measurement & Testing Equipment	$ 936,864	$ 1,228	$ -	$ 938,092	-$ 822,060	-$ 43,447	$ -	-$ 865,506	$ 72,585
8	1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1955	Communications Equipment - phones	$ 583,791	$ 1,092	$ -	$ 584,883	-$ 361,860	-$ 48,369	$ -	-$ 410,229	$ 174,654
8	1955	Communications Equipment - Radio wireless	$ 169,773	$ 52,391	$ -	$ 222,164	-$ 137,478	-$ 31,588	$ -	-$ 169,066	$ 53,098
8	1955	Communications Equipment - Radio	$ 176,199	$ -	$ -	$ 176,199	-$ 107,047	-$ 17,620	$ -	-$ 124,667	$ 51,532
8	1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1960	Miscellaneous Equipment	$ 2,643,170	$ 2,507	$ -	$ 2,645,677	-$ 1,715,551	-$ 243,770	$ -	-$ 1,959,320	$ 686,357
47	1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1980	System Supervisor Equipment	$ 5,049,580	$ 64,976	$ -	$ 5,114,556	-$ 2,934,947	-$ 211,422	$ -	-$ 3,146,369	$ 1,968,187
47	1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1995	Contributions & Grants	-$ 31,831,420	$ -	$ -	-$ 31,831,420	$ 10,448,904	$ 739,530	$ -	$ 11,188,434	-$ 20,642,986
47	2440	Deferred Revenue - 1808[5]	$ -	-$ 24,595	$ -	-$ 24,595	$ -	$ 1,640	$ -	$ 1,640	-$ 22,956
47	2440	Deferred Revenue - 1830[5]	-$ 860,428	-$ 394,191	$ -	-$ 1,254,619	$ 24,878	$ 27,880	$ -	$ 52,759	-$ 1,201,861
47	2440	Deferred Revenue - 1835[5]	-$ 488,364	-$ 223,569	$ -	-$ 711,932	$ 14,136	$ 15,821	$ -	$ 29,957	-$ 681,976
47	2440	Deferred Revenue - 1840[5]	-$ 615,175	-$ 2,345,593	$ -	-$ 2,960,768	$ 13,811	$ 59,215	$ -	$ 73,027	-$ 2,887,742
47	2440	Deferred Revenue - 1845[5]	-$ 1,473,793	-$ 5,614,022	$ -	-$ 7,087,815	$ 47,695	$ 202,509	$ -	$ 250,204	-$ 6,837,610
47	2440	Deferred Revenue - 1850[5]	-$ 2,134,627	-$ 3,637,536	$ -	-$ 5,772,162	$ 72,980	$ 151,899	$ -	$ 224,879	-$ 5,547,284
47	2440	Deferred Revenue - 1855[5]	-$ 650,041	-$ 379,700	$ -	-$ 1,029,741	$ 18,594	$ 21,015	$ -	$ 39,609	-$ 990,132
47	2440	Deferred Revenue - 1860[5]	-$ 19,860	-$ 16,999	$ -	-$ 36,859	$ 2,379	$ 2,457	$ -	$ 4,836	-$ 32,023
	2005	Property Under Finance Lease[7]	0			$ -	0			$ -	$ -
		Sub-Total	**$ 331,035,728**	**$ 18,930,875**	**-$ 1,703,869**	**$ 348,262,733**	**-$ 142,282,955**	**-$ 9,043,746**	**$ 820,612**	**-$ 150,506,088**	**$ 197,756,645**
		Less Socialized Renewable Energy Generation Investments (input as negative)				$ -				$ -	$ -
		Less Other Non Rate-Regulated Utility Assets (input as negative)				$ -				$ -	$ -
		Total PP&E	**$ 331,035,728**	**$ 18,930,875**	**-$ 1,703,869**	**$ 348,262,733**	**-$ 142,282,955**	**-$ 9,043,746**	**$ 820,612**	**-$ 150,506,088**	**$ 197,756,645**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable[6]						0			
		Total						**-$ 9,043,746**			

			Less: *Fully Allocated Depreciation*	
10	1930&1940	Transportation	Transportation	-$ 728,392
8	1935	Stores Equipment	Stores Equipment	-$ 58,283
47	2440	Deferred Revenue	Deferred Revenue	$ 482,437
			Net Depreciation	-$ 8,739,507

Accounting Standard MIFRS
Year **2017**

CCA Class [2]	OEB Account [3]	Description [3]	Cost: Opening Balance	Cost: Additions [4]	Cost: Disposals [6]	Cost: Closing Balance	Accumulated Depreciation: Opening Balance	Accumulated Depreciation: Additions	Accumulated Depreciation: Disposals [6]	Accumulated Depreciation: Closing Balance	Net Book Value
	1609	Capital Contributions Paid	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12	1611	Computer Software (Formally known as Account 1925)	$ 6,837,432	$ 327,877	$ -	$ 7,165,309	-$ 6,151,432	-$ 351,559	$ -	-$ 6,502,990	$ 662,319
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	$ -	$ 1,432,721	$ -	$ 1,432,721	$ -	-$ 143,272	$ -	-$ 143,272	$ 1,289,449
CEC	1612	Land Rights (Formally known as Account 1906)	$ 897,918	$ 84,332	$ -	$ 982,250	$ -	$ -	$ -	$ -	$ 982,250
N/A	1805	Land	$ 2,308,592	$ -	-$ 8,051	$ 2,300,541	$ -	$ -	$ -	$ -	$ 2,300,541
47	1808	Buildings - MS	$ 332,181	$ 281,921	-$ 335,104	$ 278,998	-$ 192,038	-$ 5,345	$ 33,637	-$ 163,745	$ 115,252
47	1808	Buildings - TS	$ 4,623,179	$ 22,431	$ -	$ 4,645,611	-$ 1,129,427	-$ 74,186	$ -	-$ 1,203,613	$ 3,441,997
47	1808	Buildings & Fixtures - Service Centre	$ 20,326,363	$ 180,234	$ -	$ 20,506,597	-$ 2,006,186	-$ 403,549	$ -	-$ 2,409,734	$ 18,096,862
47	1808	Service Centre - Parking Lot & Fence	$ 790,899	$ -	$ -	$ 790,899	-$ 147,861	-$ 33,359	$ -	-$ 181,220	$ 609,679
47	1808	Service Centre - HVAC	$ 4,258,907	$ 6,583	$ -	$ 4,265,490	-$ 1,269,025	-$ 315,687	$ -	-$ 1,584,712	$ 2,680,778
47	1808	Service Centre - Roof	$ 613,985	$ -	$ -	$ 613,985	-$ 146,554	-$ 33,345	$ -	-$ 179,899	$ 434,086
47	1808	Service Centre - Automation	$ 50,290	$ -	$ -	$ 50,290	-$ 14,321	-$ 3,481	$ -	-$ 17,802	$ 32,488
47	1808	Operation Centre - Workshop	$ 61,364	$ -	$ -	$ 61,364	-$ 56,641	-$ 150	$ -	-$ 56,791	$ 4,573
13	1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1815	Transformer Station Equipment >50 kV	$ 15,156,272	$ 18,670	$ -	$ 15,174,942	-$ 9,943,909	-$ 570,428	$ -	-$ 10,514,337	$ 4,660,605
47	1815	TSE Auxiliary equipment	$ 1,838,497	$ 137,102	$ -	$ 1,975,600	-$ 486,702	-$ 69,536	$ -	-$ 556,238	$ 1,419,362
47	1815	TSE - P&C equipment	$ 3,369,705	$ 152,863	$ -	$ 3,522,568	-$ 1,172,878	-$ 265,563	$ -	-$ 1,438,441	$ 2,084,128
47	1815	TSE - Power transformer	$ 12,341,512	$ -	$ -	$ 12,341,512	-$ 2,703,071	-$ 244,209	$ -	-$ 2,947,280	$ 9,394,232
47	1820	Distribution Station Equipment <50 kV	$ 5,123,535	$ 339,763	-$ 301,984	$ 5,161,314	-$ 3,245,448	-$ 96,618	$ 292,274	-$ 3,049,792	$ 2,111,523
47	1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1830	Poles, Towers & Fixtures	$ 74,856,216	$ 4,737,205	-$ 34,999	$ 79,558,421	-$ 27,390,516	-$ 1,393,433	$ 27,891	-$ 28,756,058	$ 50,802,363
47	1835	Overhead Conductors & Devices	$ 38,356,611	$ 2,794,117	$ -	$ 41,150,728	-$ 11,860,189	-$ 786,505	$ -	-$ 12,646,695	$ 28,504,033
47	1835	OH Manual line switches	$ 1,080,705	$ 207,230	$ -	$ 1,287,936	-$ 100,387	-$ 42,931	$ -	-$ 143,318	$ 1,144,617
47	1835	OH SCADA control equipment	$ 2,425,664	$ 10,080	$ -	$ 2,435,744	-$ 353,406	-$ 162,383	$ -	-$ 515,789	$ 1,919,955
47	1840	Underground Conduit	$ 22,453,063	$ 956,850	$ -	$ 23,409,914	-$ 8,743,031	-$ 345,363	$ -	-$ 9,088,394	$ 14,321,520
47	1845	Underground Conductors & Devices	$ 52,988,372	$ 2,533,856	$ -	$ 55,522,228	-$ 21,222,460	-$ 1,255,035	$ -	-$ 22,477,496	$ 33,044,733
47	1850	Line Transformers - Overhead	$ 31,367,305	$ 1,862,119	-$ 340,865	$ 32,888,559	-$ 15,328,855	-$ 478,161	$ 74,754	-$ 15,732,262	$ 17,156,297
47	1850	Line Transformers - Underground	$ 28,064,262	$ 1,688,856	-$ 115,605	$ 29,637,513	-$ 9,909,766	-$ 746,597	$ 2,897	-$ 10,653,466	$ 18,984,047
47	1855	Services - Overhead	$ 10,151,518	$ 258,767	$ -	$ 10,410,285	-$ 5,287,942	-$ 145,295	$ -	-$ 5,433,238	$ 4,977,048
47	1855	Services - Underground	$ 17,098,682	$ 962,103	$ -	$ 18,060,785	-$ 7,865,022	-$ 249,974	$ -	-$ 8,114,997	$ 9,945,789
47	1860	Meters - Bidirectional	$ 35,896	$ -	$ -	$ 35,896	-$ 8,049	-$ 1,436	$ -	-$ 9,485	$ 26,411
47	1860	Meters - Commercial	$ 2,859,089	$ -	$ -	$ 2,859,089	-$ 1,758,231	-$ 135,970	$ -	-$ 1,894,201	$ 964,888
47	1860	Meters - Residential	$ 1,383,050	$ 248,474	$ -	$ 1,631,524	-$ 261,245	-$ 98,937	$ -	-$ 360,182	$ 1,271,342
47	1860	Meters C& I	$ 1,315,688	$ 398,573	$ -	$ 1,714,261	-$ 234,010	-$ 114,324	$ -	-$ 348,335	$ 1,365,926
47	1860	Meters (Smart Meters)	$ 7,709,608	$ -	$ -	$ 7,709,608	-$ 3,659,187	-$ 536,249	$ -	-$ 4,195,435	$ 3,514,173
47	1860	Meters (Wholesale)	$ 702,724	$ 70,547	$ -	$ 773,270	-$ 457,370	-$ 54,980	$ -	-$ 512,349	$ 260,921
N/A	1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (10 years)	$ 1,584,027	$ 2,710	$ -	$ 1,586,737	-$ 1,114,892	-$ 106,150	$ -	-$ 1,221,043	$ 365,694
8	1915	Office Furniture & Equipment (5 years)	$ 17,515	$ 22,557	$ -	$ 40,073	-$ 11,507	-$ 6,014	$ -	-$ 17,521	$ 22,552
10	1920	Computer Equipment - Hardware	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ 4,343,126	$ 122,517	$ -	$ 4,465,644	-$ 4,055,923	-$ 130,052	$ -	-$ 4,185,975	$ 279,669
10	1930	Transportation Equipment - car	$ 37,162	$ -	$ -	$ 37,162	-$ 37,162	$ -	$ -	-$ 37,162	$ -
10	1930	Transportation Equipment - Other - trailers etc	$ 798,282	$ 25,471	$ -	$ 823,752	-$ 387,221	-$ 41,957	$ -	-$ 429,178	$ 394,575
10	1930	Transportation Equipment - small trucks	$ 1,677,376	$ 38,239	-$ 86,177	$ 1,629,438	-$ 1,307,327	-$ 136,940	$ 85,760	-$ 1,358,507	$ 270,931
10	1930	Transportation Equipment - workplatform	$ 6,641,612	$ 449,181	-$ 279,323	$ 6,811,471	-$ 3,860,431	-$ 403,651	$ 274,922	-$ 3,989,160	$ 2,822,311
10	1930	Transportation Equipment - Hybrid system	$ 251,975	$ -	-$ 59,250	$ 192,725	-$ 167,699	-$ 31,126	$ 23,700	-$ 175,125	$ 17,600
8	1935	Stores Equipment	$ 655,921	$ 1,000	$ -	$ 656,921	-$ 393,077	-$ 58,383	$ -	-$ 451,460	$ 205,460
8	1940	Tools, Shop & Garage Equipment	$ 321,919	$ 5,100	$ -	$ 327,019	-$ 234,588	-$ 35,747	$ -	-$ 270,335	$ 56,684
8	1940	Truck tools	$ 1,183,076	$ 27,470	$ -	$ 1,210,546	-$ 1,021,286	-$ 72,697	$ -	-$ 1,093,983	$ 116,564
8	1945	Measurement & Testing Equipment	$ 938,092	$ 29,045	$ -	$ 967,137	-$ 865,506	-$ 42,792	$ -	-$ 908,299	$ 58,838
8	1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1955	Communications Equipment - phones	$ 584,883	$ -	$ -	$ 584,883	-$ 410,229	-$ 43,601	$ -	-$ 453,829	$ 131,053
8	1955	Communications Equipment - Radio wireless	$ 222,164	$ -	$ -	$ 222,164	-$ 169,066	-$ 9,850	$ -	-$ 178,916	$ 43,248
8	1955	Communications Equipment - Radio	$ 176,199	$ -	$ -	$ 176,199	-$ 124,667	-$ 17,620	$ -	-$ 142,287	$ 33,912
8	1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1960	Miscellaneous Equipment	$ 2,645,677	$ 21,067	-$ 2,507	$ 2,664,237	-$ 1,959,320	-$ 239,438	$ -	-$ 2,198,758	$ 465,479
47	1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1980	System Supervisor Equipment	$ 5,114,556	$ 12,466	$ -	$ 5,127,022	-$ 3,146,369	-$ 212,021	$ -	-$ 3,358,390	$ 1,768,632
47	1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1995	Contributions & Grants	-$ 31,831,420	$ -	$ -	-$ 31,831,420	$ 11,188,434	$ 738,533	$ -	$ 11,926,967	-$ 19,904,453
47	2440	Deferred Revenue - 1808[5]	-$ 24,595	$ -	$ -	-$ 24,595	$ 1,640	$ 1,640	$ -	$ 3,279	-$ 21,316
47	2440	Deferred Revenue - 1830[5]	-$ 1,254,619	-$ 352,048	$ -	-$ 1,606,668	$ 52,759	$ 35,704	$ -	$ 88,462	-$ 1,518,205
47	2440	Deferred Revenue - 1835[5]	-$ 711,932	-$ 199,867	$ -	-$ 911,799	$ 29,957	$ 20,262	$ -	$ 50,219	-$ 861,580
47	2440	Deferred Revenue - 1840[5]	-$ 2,960,768	-$ 547,330	$ -	-$ 3,508,098	$ 73,027	$ 70,162	$ -	$ 143,189	-$ 3,364,909
47	2440	Deferred Revenue - 1845[5]	-$ 7,087,815	-$ 1,387,526	$ -	-$ 8,475,341	$ 250,204	$ 242,153	$ -	$ 492,357	-$ 7,982,984
47	2440	Deferred Revenue - 1850[5]	-$ 5,772,162	-$ 1,637,062	$ -	-$ 7,409,224	$ 224,879	$ 194,980	$ -	$ 419,858	-$ 6,989,366
47	2440	Deferred Revenue - 1855[5]	-$ 1,029,741	-$ 432,271	$ -	-$ 1,462,012	$ 39,609	$ 29,837	$ -	$ 69,446	-$ 1,392,566
47	2440	Deferred Revenue - 1860[5]	-$ 36,859	-$ 22,397	$ -	-$ 59,256	$ 4,836	$ 3,950	$ -	$ 8,786	-$ 50,470
	2005	Property Under Finance Lease[7]	0			$ -	$ -			$ -	$ -
		Sub-Total	**$ 348,262,733**	**$ 15,891,597**	**-$ 1,563,864**	**$ 362,590,466**	**-$ 150,506,088**	**-$ 9,408,679**	**$ 815,837**	**-$ 159,098,930**	**$ 203,491,536**
		Less Socialized Renewable Energy Generation Investments (input as negative)				$ -				$ -	$ -
		Less Other Non Rate-Regulated Utility Assets (input as negative)				$ -				$ -	$ -
		Total PP&E	**$ 348,262,733**	**$ 15,891,597**	**-$ 1,563,864**	**$ 362,590,466**	**-$ 150,506,088**	**-$ 9,408,679**	**$ 815,837**	**-$ 159,098,930**	**$ 203,491,536**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable[6]						0			
		Total						**-$ 9,408,679**			

			Less: *Fully Allocated Depreciation*	
10	1930&1940	Transportation	Transportation	-$ 722,118
8	1935	Stores Equipment	Stores Equipment	-$ 58,383
47	2440	Deferred Revenue	Deferred Revenue	$ 598,687
			Net Depreciation	-$ 9,226,865

Accounting Standard MIFRS
Year 2018

CCA Class [2]	OEB Account [3]	Description [3]	Cost: Opening Balance	Cost: Additions [4]	Cost: Disposals [6]	Cost: Closing Balance	Accumulated Depreciation: Opening Balance	Accumulated Depreciation: Additions	Accumulated Depreciation: Disposals [6]	Accumulated Depreciation: Closing Balance	Net Book Value
	1609	Capital Contributions Paid	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12	1611	Computer Software (Formally known as Account 1925)	$ 7,165,309	$ 529,216	$ -	$ 7,694,525	-$ 6,502,990	-$ 388,743	$ -	-$ 6,891,733	$ 802,792
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	$ 1,432,721	$ 451,355	$ -	$ 1,884,075	-$ 143,272	-$ 188,407	$ -	-$ 331,679	$ 1,552,396
CEC	1612	Land Rights (Formally known as Account 1906)	$ 982,250	$ 77,375	$ -	$ 1,059,625	$ -	$ -	$ -	$ -	$ 1,059,625
N/A	1805	Land	$ 2,300,541	$ -	$ -	$ 2,300,541	$ -	$ -	$ -	$ -	$ 2,300,541
47	1808	Buildings - MS	$ 278,998	$ -	$ -	$ 278,998	-$ 163,745	-$ 5,345	$ -	-$ 169,090	$ 109,908
47	1808	Buildings - TS	$ 4,645,611	$ 109,904	$ -	$ 4,755,515	-$ 1,203,613	-$ 76,018	$ -	-$ 1,279,631	$ 3,475,883
47	1808	Buildings & Fixtures - Service Centre	$ 20,506,597	$ 4,930	$ -	$ 20,511,527	-$ 2,409,734	-$ 403,648	$ -	-$ 2,813,382	$ 17,698,145
47	1808	Service Centre - Parking Lot & Fence	$ 790,899	$ 25,465	$ -	$ 816,364	-$ 181,220	-$ 34,377	$ -	-$ 215,597	$ 600,767
47	1808	Service Centre - HVAC	$ 4,265,490	$ -	$ -	$ 4,265,490	-$ 1,584,712	-$ 315,687	$ -	-$ 1,900,398	$ 2,365,091
47	1808	Service Centre - Roof	$ 613,985	$ -	$ -	$ 613,985	-$ 179,899	-$ 33,345	$ -	-$ 213,245	$ 400,740
47	1808	Service Centre - Automation	$ 50,290	$ -	$ -	$ 50,290	-$ 17,802	-$ 3,481	$ -	-$ 21,283	$ 29,006
47	1808	Operation Centre - Workshop	$ 61,364	$ -	$ -	$ 61,364	-$ 56,791	-$ 150	$ -	-$ 56,941	$ 4,423
13	1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1815	Transformer Station Equipment >50 kV	$ 15,174,942	$ 98,732	$ -	$ 15,273,674	-$ 10,514,337	-$ 487,292	$ -	-$ 11,001,629	$ 4,272,044
47	1815	TSE Auxiliary equipment	$ 1,975,600	$ 232,516	$ -	$ 2,208,116	-$ 556,238	-$ 77,286	$ -	-$ 633,525	$ 1,574,591
47	1815	TSE - P&C equipment	$ 3,522,568	$ 444,071	$ -	$ 3,966,639	-$ 1,438,441	-$ 295,166	$ -	-$ 1,733,607	$ 2,233,032
47	1815	TSE - Power transformer	$ 12,341,512	$ 83,676	$ -	$ 12,425,189	-$ 2,947,280	-$ 245,883	$ -	-$ 3,193,163	$ 9,232,026
47	1820	Distribution Station Equipment <50 kV	$ 5,161,314	$ -	$ -	$ 5,161,314	-$ 3,049,792	-$ 91,778	$ -	-$ 3,141,569	$ 2,019,745
47	1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1830	Poles, Towers & Fixtures	$ 79,558,421	$ 4,736,272	$ -	$ 84,294,693	-$ 28,756,058	-$ 1,498,684	$ -	-$ 30,254,742	$ 54,039,951
47	1835	Overhead Conductors & Devices	$ 41,150,728	$ 2,582,727	$ -	$ 43,733,455	-$ 12,646,695	-$ 825,162	$ -	-$ 13,471,857	$ 30,261,598
47	1835	OH Manual line switches	$ 1,287,936	$ 175,379	$ -	$ 1,463,314	-$ 143,318	-$ 48,777	$ -	-$ 192,095	$ 1,271,219
47	1835	OH SCADA control equipment	$ 2,435,744	$ 25,686	$ -	$ 2,461,430	-$ 515,789	-$ 164,095	$ -	-$ 679,885	$ 1,781,546
47	1840	Underground Conduit	$ 23,409,914	$ 1,440,326	$ -	$ 24,850,240	-$ 9,088,394	-$ 374,169	$ -	-$ 9,462,563	$ 15,387,677
47	1845	Underground Conductors & Devices	$ 55,522,228	$ 2,619,170	$ -	$ 58,141,398	-$ 22,477,496	-$ 1,323,798	$ -	-$ 23,801,294	$ 34,340,105
47	1850	Line Transformers - Overhead	$ 32,888,559	$ 1,579,217	-$ 197,800	$ 34,269,976	-$ 15,732,262	-$ 508,425	$ -	-$ 16,240,688	$ 18,029,288
47	1850	Line Transformers - Underground	$ 29,637,513	$ 1,409,098	-$ 92,215	$ 30,954,396	-$ 10,653,466	-$ 783,777	$ -	-$ 11,437,243	$ 19,517,154
47	1855	Services - Overhead	$ 10,410,285	$ 314,093	$ -	$ 10,724,378	-$ 5,433,238	-$ 152,275	$ -	-$ 5,585,513	$ 5,138,866
47	1855	Services - Underground	$ 18,060,785	$ 714,805	$ -	$ 18,775,591	-$ 8,114,997	-$ 264,270	$ -	-$ 8,379,267	$ 10,396,324
47	1860	Meters - Bidirectional	$ 35,896	$ 11,943	$ -	$ 47,838	-$ 9,485	-$ 1,914	$ -	-$ 11,398	$ 36,440
47	1860	Meters - Commercial	$ 2,859,089	$ -	$ -	$ 2,859,089	-$ 1,894,201	-$ 133,286	$ -	-$ 2,027,487	$ 831,602
47	1860	Meters - Residential	$ 1,631,524	$ 300,697	$ -	$ 1,932,220	-$ 360,182	-$ 118,983	$ -	-$ 479,165	$ 1,453,055
47	1860	Meters C& I	$ 1,714,261	$ 209,740	$ -	$ 1,924,000	-$ 348,335	-$ 128,307	$ -	-$ 476,641	$ 1,447,359
47	1860	Meters (Smart Meters)	$ 7,709,608	$ -	$ -	$ 7,709,608	-$ 4,195,435	-$ 536,249	$ -	-$ 4,731,684	$ 2,977,924
47	1860	Meters (Wholesale)	$ 773,270	$ -	$ -	$ 773,270	-$ 512,349	-$ 54,781	$ -	-$ 567,130	$ 206,140
N/A	1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (10 years)	$ 1,586,737	$ 12,409	$ -	$ 1,599,146	-$ 1,221,043	-$ 106,845	$ -	-$ 1,327,888	$ 271,258
8	1915	Office Furniture & Equipment (5 years)	$ 40,073	$ 45,818	$ -	$ 85,891	-$ 17,521	-$ 15,177	$ -	-$ 32,698	$ 53,193
10	1920	Computer Equipment - Hardware	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ 4,465,644	$ 202,146	$ -	$ 4,667,790	-$ 4,185,975	-$ 152,911	$ -	-$ 4,338,886	$ 328,904
10	1930	Transportation Equipment - car	$ 37,162	$ -	$ -	$ 37,162	-$ 37,162	$ -	$ -	-$ 37,162	$ -
10	1930	Transportation Equipment - Other - trailers etc	$ 823,752	$ 3,744	$ -	$ 827,496	-$ 429,178	-$ 42,207	$ -	-$ 471,384	$ 356,112
10	1930	Transportation Equipment - small trucks	$ 1,629,438	$ -	-$ 96,120	$ 1,533,318	-$ 1,358,507	-$ 127,729	$ 96,120	-$ 1,390,116	$ 143,202
10	1930	Transportation Equipment - workplatform	$ 6,811,471	$ 497,426	-$ 1,079,524	$ 6,229,372	-$ 3,989,160	-$ 432,602	$ 1,035,121	-$ 3,386,640	$ 2,842,732
10	1930	Transportation Equipment - Hybrid system	$ 192,725	$ 5,843	-$ 198,567	$ -	-$ 175,125	$ -	$ 175,125	$ -	$ -
8	1935	Stores Equipment	$ 656,921	$ 43,802	-$ 2,811	$ 697,911	-$ 451,460	-$ 52,563	$ 2,530	-$ 501,493	$ 196,418
8	1940	Tools, Shop & Garage Equipment	$ 327,019	$ 3,200	$ -	$ 330,219	-$ 270,335	-$ 36,147	$ -	-$ 306,482	$ 23,737
8	1940	Truck tools	$ 1,210,546	$ 83,355	$ -	$ 1,293,901	-$ 1,093,983	-$ 75,105	$ -	-$ 1,169,087	$ 124,814
8	1945	Measurement & Testing Equipment	$ 967,137	$ 37,821	$ -	$ 1,004,958	-$ 908,299	-$ 29,779	$ -	-$ 938,078	$ 66,880
8	1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1955	Communications Equipment - phones	$ 584,883	$ -	$ -	$ 584,883	-$ 453,829	-$ 43,601	$ -	-$ 497,430	$ 87,453
8	1955	Communications Equipment - Radio wireless	$ 222,164	$ -	$ -	$ 222,164	-$ 178,916	-$ 8,964	$ -	-$ 187,880	$ 34,284
8	1955	Communications Equipment - Radio	$ 176,199	$ -	$ -	$ 176,199	-$ 142,287	-$ 17,620	$ -	-$ 159,907	$ 16,292
8	1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1960	Miscellaneous Equipment	$ 2,664,237	$ 38,743	$ -	$ 2,702,981	-$ 2,198,758	-$ 192,673	$ -	-$ 2,391,432	$ 311,549
47	1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1980	System Supervisor Equipment	$ 5,127,022	$ 386,732	$ -	$ 5,513,754	-$ 3,358,390	-$ 234,790	$ -	-$ 3,593,180	$ 1,920,574
47	1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1995	Contributions & Grants	-$ 31,831,420	$ -	$ -	-$ 31,831,420	$ 11,926,967	$ 737,255	$ -	$ 12,664,222	-$ 19,167,198
47	2440	Deferred Revenue - 1808[5]	-$ 24,595	$ -	$ -	-$ 24,595	$ 3,279	$ 1,640	$ -	$ 4,919	-$ 19,676
47	2440	Deferred Revenue - 1830[5]	-$ 1,606,668	-$ 386,171	$ -	-$ 1,992,838	$ 88,462	$ 44,285	$ -	$ 132,748	-$ 1,860,091
47	2440	Deferred Revenue - 1835[5]	-$ 911,799	-$ 219,954	$ -	-$ 1,131,753	$ 50,219	$ 25,150	$ -	$ 75,369	-$ 1,056,384
47	2440	Deferred Revenue - 1840[5]	-$ 3,508,098	-$ 286,098	$ -	-$ 3,794,195	$ 143,189	$ 75,884	$ -	$ 219,072	-$ 3,575,123
47	2440	Deferred Revenue - 1845[5]	-$ 8,475,341	-$ 717,985	$ -	-$ 9,193,326	$ 492,357	$ 262,666	$ -	$ 755,023	-$ 8,438,302
47	2440	Deferred Revenue - 1850[5]	-$ 7,409,224	-$ 1,043,279	$ -	-$ 8,452,504	$ 419,858	$ 222,434	$ -	$ 642,292	-$ 7,810,211
47	2440	Deferred Revenue - 1855[5]	-$ 1,462,012	-$ 299,940	$ -	-$ 1,761,952	$ 69,446	$ 35,958	$ -	$ 105,404	-$ 1,656,548
47	2440	Deferred Revenue - 1860[5]	-$ 59,256	-$ 15,503	$ -	-$ 74,760	$ 8,786	$ 4,984	$ -	$ 13,770	-$ 60,989
	2005	Property Under Finance Lease[7]	0			$ -	$ -			$ -	$ -
		Sub-Total	**$ 362,590,466**	**$ 16,568,500**	**-$ 1,667,037**	**$ 377,491,930**	**-$ 159,098,930**	**-$ 9,722,013**	**$ 1,308,895**	**-$ 167,512,047**	**$ 209,979,882**
		Less Socialized Renewable Energy Generation Investments (input as negative)				$ -				$ -	$ -
		Less Other Non Rate-Regulated Utility Assets (input as negative)				$ -				$ -	$ -
		Total PP&E	**$ 362,590,466**	**$ 16,568,500**	**-$ 1,667,037**	**$ 377,491,930**	**-$ 159,098,930**	**-$ 9,722,013**	**$ 1,308,895**	**-$ 167,512,047**	**$ 209,979,882**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable[6]						0			
		Total						**-$ 9,722,013**			

			Less: *Fully Allocated Depreciation*	
10	1930&1940	Transportation	Transportation	-$ 713,788
8	1935	Stores Equipment	Stores Equipment	-$ 52,563
47	2440	Deferred Revenue	Deferred Revenue	$ 673,002
			Net Depreciation	-$ 9,628,663

Accounting Standard MIFRS
Year 2019

CCA Class [2]	OEB Account [3]	Description [3]	Cost: Opening Balance	Cost: Additions [4]	Cost: Disposals [6]	Cost: Closing Balance	Accumulated Depreciation: Opening Balance	Accumulated Depreciation: Additions	Accumulated Depreciation: Disposals [6]	Accumulated Depreciation: Closing Balance	Net Book Value
	1609	Capital Contributions Paid	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12	1611	Computer Software (Formally known as Account 1925)	$ 7,694,525	$ 235,998	$ -	$ 7,930,523	-$ 6,891,733	-$ 363,635	$ -	-$ 7,255,368	$ 675,155
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	$ 1,884,075	$ -	$ -	$ 1,884,075	-$ 331,679	-$ 188,408	$ -	-$ 520,087	$ 1,363,988
CEC	1612	Land Rights (Formally known as Account 1906)	$ 1,059,625	$ 64,686	$ -	$ 1,124,311	$ -	$ -	$ -	$ -	$ 1,124,311
N/A	1805	Land	$ 2,300,541	$ -	$ -	$ 2,300,541	$ -	$ -	$ -	$ -	$ 2,300,541
47	1808	Buildings - MS	$ 278,998	$ -	$ -	$ 278,998	-$ 169,090	-$ 5,345	$ -	-$ 174,435	$ 104,563
47	1808	Buildings - TS	$ 4,755,515	$ 53,214	$ -	$ 4,808,728	-$ 1,279,631	-$ 76,905	$ -	-$ 1,356,536	$ 3,452,192
47	1808	Buildings & Fixtures - Service Centre	$ 20,511,527	$ -	$ -	$ 20,511,527	-$ 2,813,382	-$ 403,647	$ -	-$ 3,217,030	$ 17,294,497
47	1808	Service Centre - Parking Lot & Fence	$ 816,364	$ -	$ -	$ 816,364	-$ 215,597	-$ 34,377	$ -	-$ 249,975	$ 566,389
47	1808	Service Centre - HVAC	$ 4,265,490	$ 8,004	$ -	$ 4,273,493	-$ 1,900,398	-$ 316,220	$ -	-$ 2,216,619	$ 2,056,875
47	1808	Service Centre - Roof	$ 613,985	$ -	$ -	$ 613,985	-$ 213,245	-$ 33,345	$ -	-$ 246,590	$ 367,395
47	1808	Service Centre - Automation	$ 50,290	$ -	$ -	$ 50,290	-$ 21,283	-$ 3,481	$ -	-$ 24,765	$ 25,525
47	1808	Operation Centre - Workshop	$ 61,364	$ -	$ -	$ 61,364	-$ 56,941	-$ 150	$ -	-$ 57,091	$ 4,273
13	1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1815	Transformer Station Equipment >50 kV	$ 15,273,674	$ -	$ -	$ 15,273,674	-$ 11,001,629	-$ 444,212	$ -	-$ 11,445,841	$ 3,827,832
47	1815	TSE Auxiliary equipment	$ 2,208,116	$ 424,045	$ -	$ 2,632,161	-$ 633,525	-$ 91,421	$ -	-$ 724,946	$ 1,907,215
47	1815	TSE - P&C equipment	$ 3,966,639	$ 83,160	$ -	$ 4,049,798	-$ 1,733,607	-$ 300,711	$ -	-$ 2,034,318	$ 2,015,481
47	1815	TSE - Power transformer	$ 12,425,189	$ -	$ -	$ 12,425,189	-$ 3,193,163	-$ 245,883	$ -	-$ 3,439,045	$ 8,986,143
47	1820	Distribution Station Equipment <50 kV	$ 5,161,314	$ -	$ -	$ 5,161,314	-$ 3,141,569	-$ 89,926	$ -	-$ 3,231,496	$ 1,929,819
47	1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1830	Poles, Towers & Fixtures	$ 84,294,693	$ 4,018,102	$ -	$ 88,312,795	-$ 30,254,742	-$ 1,587,975	$ -	-$ 31,842,717	$ 56,470,078
47	1835	Overhead Conductors & Devices	$ 43,733,455	$ 2,345,712	$ -	$ 46,079,167	-$ 13,471,857	-$ 857,700	$ -	-$ 14,329,557	$ 31,749,610
47	1835	OH Manual line switches	$ 1,463,314	$ 174,683	$ -	$ 1,637,997	-$ 192,095	-$ 54,600	$ -	-$ 246,695	$ 1,391,303
47	1835	OH SCADA control equipment	$ 2,461,430	$ 322,165	$ -	$ 2,783,596	-$ 679,885	-$ 185,573	$ -	-$ 865,458	$ 1,918,138
47	1840	Underground Conduit	$ 24,850,240	$ 1,477,608	$ -	$ 26,327,848	-$ 9,462,563	-$ 403,728	$ -	-$ 9,866,291	$ 16,461,558
47	1845	Underground Conductors & Devices	$ 58,141,398	$ 2,380,771	$ -	$ 60,522,169	-$ 23,801,294	-$ 1,381,279	$ -	-$ 25,182,573	$ 35,339,597
47	1850	Line Transformers - Overhead	$ 34,269,976	$ 1,571,027	-$ 240,634	$ 35,600,369	-$ 16,240,688	-$ 542,046	$ -	-$ 16,782,734	$ 18,817,635
47	1850	Line Transformers - Underground	$ 30,954,396	$ 2,117,840	$ -	$ 33,072,236	-$ 11,437,243	-$ 846,209	$ -	-$ 12,283,452	$ 20,788,784
47	1855	Services - Overhead	$ 10,724,378	$ 253,197	$ -	$ 10,977,575	-$ 5,585,513	-$ 157,902	$ -	-$ 5,743,414	$ 5,234,161
47	1855	Services - Underground	$ 18,775,591	$ 952,186	$ -	$ 19,727,776	-$ 8,379,267	-$ 283,314	$ -	-$ 8,662,580	$ 11,065,196
47	1860	Meters - Bidirectional	$ 47,838	$ 46,152	$ -	$ 93,991	-$ 11,398	-$ 3,760	$ -	-$ 15,158	$ 78,833
47	1860	Meters - Commercial	$ 2,859,089	$ -	$ -	$ 2,859,089	-$ 2,027,487	-$ 131,879	$ -	-$ 2,159,366	$ 699,723
47	1860	Meters - Residential	$ 1,932,220	$ 303,728	$ -	$ 2,235,949	-$ 479,165	-$ 139,232	$ -	-$ 618,397	$ 1,617,551
47	1860	Meters C& I	$ 1,924,000	$ 563,686	$ -	$ 2,487,686	-$ 476,641	-$ 165,886	$ -	-$ 642,527	$ 1,845,159
47	1860	Meters (Smart Meters)	$ 7,709,608	$ -	$ -	$ 7,709,608	-$ 4,731,684	-$ 536,249	$ -	-$ 5,267,933	$ 2,441,675
47	1860	Meters (Wholesale)	$ 773,270	$ 270,831	$ -	$ 1,044,101	-$ 567,130	-$ 47,074	$ -	-$ 614,204	$ 429,897
N/A	1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (10 years)	$ 1,599,146	$ 5,094	$ -	$ 1,604,240	-$ 1,327,888	-$ 105,471	$ -	-$ 1,433,359	$ 170,880
8	1915	Office Furniture & Equipment (5 years)	$ 85,891	$ 28,391	$ -	$ 114,282	-$ 32,698	-$ 20,855	$ -	-$ 53,553	$ 60,729
10	1920	Computer Equipment - Hardware	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ 4,667,790	$ 226,841	$ -	$ 4,894,631	-$ 4,338,886	-$ 167,864	$ -	-$ 4,506,750	$ 387,881
10	1930	Transportation Equipment - car	$ 37,162	$ -	$ -	$ 37,162	-$ 37,162	$ -	$ -	-$ 37,162	$ -
10	1930	Transportation Equipment - Other - trailers etc	$ 827,496	$ 60,675	$ -	$ 888,171	-$ 471,384	-$ 46,251	$ -	-$ 517,635	$ 370,535
10	1930	Transportation Equipment - small trucks	$ 1,533,318	$ 243,175	-$ 31,438	$ 1,745,055	-$ 1,390,116	-$ 102,942	$ 31,438	-$ 1,461,620	$ 283,435
10	1930	Transportation Equipment - workplatform	$ 6,229,372	$ 414,438	$ -	$ 6,643,811	-$ 3,386,640	-$ 457,794	$ -	-$ 3,844,434	$ 2,799,376
10	1930	Transportation Equipment - Hybrid system	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1935	Stores Equipment	$ 697,911	$ -	$ -	$ 697,911	-$ 501,493	-$ 52,563	$ -	-$ 554,056	$ 143,855
8	1940	Tools, Shop & Garage Equipment	$ 330,219	$ 24,230	$ -	$ 354,449	-$ 306,482	-$ 15,401	$ -	-$ 321,883	$ 32,567
8	1940	Truck tools	$ 1,293,901	$ 41,020	$ -	$ 1,334,921	-$ 1,169,087	-$ 60,626	$ -	-$ 1,229,713	$ 105,208
8	1945	Measurement & Testing Equipment	$ 1,004,958	$ 33,320	$ -	$ 1,038,278	-$ 938,078	-$ 20,999	$ -	-$ 959,077	$ 79,201
8	1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1955	Communications Equipment - phones	$ 584,883	$ 188,899	-$ 537,610	$ 236,172	-$ 497,430	-$ 23,617	$ 468,194	-$ 52,853	$ 183,319
8	1955	Communications Equipment - Radio wireless	$ 222,164	$ -	$ -	$ 222,164	-$ 187,880	-$ 7,838	$ -	-$ 195,718	$ 26,447
8	1955	Communications Equipment - Radio	$ 176,199	$ 1,292	$ -	$ 177,491	-$ 159,907	-$ 6,978	$ -	-$ 166,885	$ 10,606
8	1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1960	Miscellaneous Equipment	$ 2,702,981	$ 12,422	$ -	$ 2,715,403	-$ 2,391,432	-$ 135,933	$ -	-$ 2,527,365	$ 188,038
47	1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1980	System Supervisor Equipment	$ 5,513,754	$ 704,479	$ -	$ 6,218,233	-$ 3,593,180	-$ 276,289	$ -	-$ 3,869,469	$ 2,348,764
47	1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1995	Contributions & Grants	-$ 31,831,420	$ -	$ -	-$ 31,831,420	$ 12,664,222	$ 735,693	$ -	$ 13,399,915	-$ 18,431,505
47	2440	Deferred Revenue - 1808[5]	-$ 24,595	$ -	$ -	-$ 24,595	$ 4,919	$ 1,228	$ -	$ 6,147	-$ 18,448
47	2440	Deferred Revenue - 1830[5]	-$ 1,992,838	-$ 254,510	$ -	-$ 2,247,348	$ 132,748	$ 49,941	$ -	$ 182,689	-$ 2,064,659
47	2440	Deferred Revenue - 1835[5]	-$ 1,131,753	-$ 146,280	$ -	-$ 1,278,033	$ 75,369	$ 28,401	$ -	$ 103,770	-$ 1,174,263
47	2440	Deferred Revenue - 1840[5]	-$ 3,794,195	-$ 54,976	$ -	-$ 3,849,172	$ 219,072	$ 76,983	$ -	$ 296,056	-$ 3,553,116
47	2440	Deferred Revenue - 1845[5]	-$ 9,193,326	-$ 183,847	$ -	-$ 9,377,173	$ 755,023	$ 267,919	$ -	$ 1,022,943	-$ 8,354,230
47	2440	Deferred Revenue - 1850[5]	-$ 8,452,504	-$ 961,075	$ -	-$ 9,413,578	$ 642,292	$ 247,726	$ -	$ 890,018	-$ 8,523,560
47	2440	Deferred Revenue - 1855[5]	-$ 1,761,952	-$ 464,805	$ -	-$ 2,226,757	$ 105,404	$ 45,444	$ -	$ 150,848	-$ 2,075,909
47	2440	Deferred Revenue - 1860[5]	-$ 74,760	-$ 45,447	$ -	-$ 120,207	$ 13,770	$ 8,014	$ -	$ 21,784	-$ 98,423
	2005	Property Under Finance Lease[7]	0			$ -	$ -			$ -	$ -
		Sub-Total	**$ 377,491,930**	**$ 17,540,132**	**-$ 809,683**	**$ 394,222,378**	**-$ 167,512,047**	**-$ 9,962,145**	**$ 499,633**	**-$ 176,974,559**	**$ 217,247,819**
		Less Socialized Renewable Energy Generation Investments (input as negative)				$ -				$ -	$ -
		Less Other Non Rate-Regulated Utility Assets (input as negative)				$ -				$ -	$ -
		Total PP&E	**$ 377,491,930**	**$ 17,540,132**	**-$ 809,683**	**$ 394,222,378**	**-$ 167,512,047**	**-$ 9,962,145**	**$ 499,633**	**-$ 176,974,559**	**$ 217,247,819**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable[6]						0			
		Total						**-$ 9,962,145**			

			Less: *Fully Allocated Depreciation*	
10	1930&1940	Transportation	Transportation	-$ 683,014
8	1935	Stores Equipment	Stores Equipment	-$ 52,563
47	2440	Deferred Revenue	Deferred Revenue	$ 725,656
			Net Depreciation	-$ 9,952,224

Accounting Standard	MIFRS
Year	**2020**

CCA Class [2]	OEB Account [3]	Description [3]	Cost: Opening Balance	Cost: Additions [4]	Cost: Disposals [6]	Cost: Closing Balance	Accumulated Depreciation: Opening Balance	Accumulated Depreciation: Additions	Accumulated Depreciation: Disposals [6]	Accumulated Depreciation: Closing Balance	Net Book Value
	1609	Capital Contributions Paid	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12	1611	Computer Software (Formally known as Account 1925)	$ 7,930,523	$ 2,049,750	$ -	$ 9,980,273	-$ 7,255,368	-$ 666,244	$ -	-$ 7,921,613	$ 2,058,661
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	$ 1,884,075	$ -	$ -	$ 1,884,075	-$ 520,087	-$ 188,408	$ -	-$ 708,495	$ 1,175,581
CEC	1612	Land Rights (Formally known as Account 1906)	$ 1,124,311	$ 85,233	$ -	$ 1,209,544	$ -	$ -	$ -	$ -	$ 1,209,544
N/A	1805	Land	$ 2,300,541	$ -	$ -	$ 2,300,541	$ -	$ -	$ -	$ -	$ 2,300,541
47	1808	Buildings - MS	$ 278,998	$ -	$ -	$ 278,998	-$ 174,435	-$ 5,345	$ -	-$ 179,780	$ 99,218
47	1808	Buildings - TS	$ 4,808,728	$ 15,786	$ -	$ 4,824,514	-$ 1,356,536	-$ 77,168	$ -	-$ 1,433,705	$ 3,390,810
47	1808	Buildings & Fixtures - Service Centre	$ 20,511,527	$ -	$ -	$ 20,511,527	-$ 3,217,030	-$ 403,647	$ -	-$ 3,620,677	$ 16,890,850
47	1808	Service Centre - Parking Lot & Fence	$ 816,364	$ -	$ -	$ 816,364	-$ 249,975	-$ 34,377	$ -	-$ 284,352	$ 532,012
47	1808	Service Centre - HVAC	$ 4,273,493	$ -	$ -	$ 4,273,493	-$ 2,216,619	-$ 316,220	$ -	-$ 2,532,839	$ 1,740,655
47	1808	Service Centre - Roof	$ 613,985	$ -	$ -	$ 613,985	-$ 246,590	-$ 33,345	$ -	-$ 279,935	$ 334,050
47	1808	Service Centre - Automation	$ 50,290	$ -	$ -	$ 50,290	-$ 24,765	-$ 3,481	$ -	-$ 28,246	$ 22,044
47	1808	Operation Centre - Workshop	$ 61,364	$ -	$ -	$ 61,364	-$ 57,091	-$ 150	$ -	-$ 57,241	$ 4,123
13	1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1815	Transformer Station Equipment >50 kV	$ 15,273,674	$ 1,210,581	$ -	$ 16,484,255	-$ 11,445,841	-$ 476,269	$ -	-$ 11,922,110	$ 4,562,144
47	1815	TSE Auxiliary equipment	$ 2,632,161	$ -	$ -	$ 2,632,161	-$ 724,946	-$ 91,421	$ -	-$ 816,367	$ 1,815,794
47	1815	TSE - P&C equipment	$ 4,049,798	$ -	$ -	$ 4,049,798	-$ 2,034,318	-$ 300,711	$ -	-$ 2,335,029	$ 1,714,770
47	1815	TSE - Power transformer	$ 12,425,189	$ -	$ -	$ 12,425,189	-$ 3,439,045	-$ 245,883	$ -	-$ 3,684,928	$ 8,740,261
47	1820	Distribution Station Equipment <50 kV	$ 5,161,314	$ 126,530	$ -	$ 5,287,844	-$ 3,231,496	-$ 77,368	$ -	-$ 3,308,864	$ 1,978,980
47	1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1830	Poles, Towers & Fixtures	$ 88,312,795	$ 4,019,071	$ -	$ 92,331,866	-$ 31,842,717	-$ 1,677,287	$ -	-$ 33,520,004	$ 58,811,861
47	1835	Overhead Conductors & Devices	$ 46,079,167	$ 2,100,400	$ -	$ 48,179,567	-$ 14,329,557	-$ 904,376	$ -	-$ 15,233,933	$ 32,945,634
47	1835	OH Manual line switches	$ 1,637,997	$ -	$ -	$ 1,637,997	-$ 246,695	-$ 54,600	$ -	-$ 301,294	$ 1,336,703
47	1835	OH SCADA control equipment	$ 2,783,596	$ -	$ -	$ 2,783,596	-$ 865,458	-$ 203,718	$ -	-$ 1,069,176	$ 1,714,420
47	1840	Underground Conduit	$ 26,327,848	$ 1,115,695	$ -	$ 27,443,543	-$ 9,866,291	-$ 426,042	$ -	-$ 10,292,332	$ 17,151,210
47	1845	Underground Conductors & Devices	$ 60,522,169	$ 2,122,029	$ -	$ 62,644,198	-$ 25,182,573	-$ 1,428,724	$ -	-$ 26,611,297	$ 36,032,901
47	1850	Line Transformers - Overhead	$ 35,600,369	$ 2,182,109	$ -	$ 37,782,477	-$ 16,782,734	-$ 590,537	$ -	-$ 17,373,271	$ 20,409,206
47	1850	Line Transformers - Underground	$ 33,072,236	$ 2,767,347	$ -	$ 35,839,583	-$ 12,283,452	-$ 925,276	$ -	-$ 13,208,728	$ 22,630,855
47	1855	Services - Overhead	$ 10,977,575	$ 489,596	$ -	$ 11,467,171	-$ 5,743,414	-$ 168,781	$ -	-$ 5,912,196	$ 5,554,975
47	1855	Services - Underground	$ 19,727,776	$ 797,618	$ -	$ 20,525,394	-$ 8,662,580	-$ 299,266	$ -	-$ 8,961,847	$ 11,563,547
47	1860	Meters - Bidirectional	$ 93,991	$ -	$ -	$ 93,991	-$ 15,158	-$ 3,760	$ -	-$ 18,917	$ 75,073
47	1860	Meters - Commercial	$ 2,859,089	$ -	$ -	$ 2,859,089	-$ 2,159,366	-$ 128,182	$ -	-$ 2,287,548	$ 571,541
47	1860	Meters - Residential	$ 2,235,949	$ 334,193	$ -	$ 2,570,142	-$ 618,397	-$ 161,511	$ -	-$ 779,909	$ 1,790,233
47	1860	Meters C& I	$ 2,487,686	$ 379,793	$ -	$ 2,867,480	-$ 642,527	-$ 191,205	$ -	-$ 833,732	$ 2,033,747
47	1860	Meters (Smart Meters)	$ 7,709,608	$ -	$ -	$ 7,709,608	-$ 5,267,933	-$ 536,249	$ -	-$ 5,804,181	$ 1,905,427
47	1860	Meters (Wholesale)	$ 1,044,101	$ 46,944	$ -	$ 1,091,045	-$ 614,204	-$ 45,368	$ -	-$ 659,572	$ 431,473
N/A	1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (10 years)	$ 1,604,240	$ 155,066	$ -	$ 1,759,306	-$ 1,433,359	-$ 120,485	$ -	-$ 1,553,845	$ 205,461
8	1915	Office Furniture & Equipment (5 years)	$ 114,282	$ -	$ -	$ 114,282	-$ 53,553	-$ 20,855	$ -	-$ 74,408	$ 39,874
10	1920	Computer Equipment - Hardware	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ 4,894,631	$ 280,053	$ -	$ 5,174,684	-$ 4,506,750	-$ 195,712	$ -	-$ 4,702,462	$ 472,222
10	1930	Transportation Equipment - car	$ 37,162	$ -	$ -	$ 37,162	-$ 37,162	$ -	$ -	-$ 37,162	$ -
10	1930	Transportation Equipment - Other - trailers etc	$ 888,171	$ 23,644	$ -	$ 911,815	-$ 517,635	-$ 47,827	$ -	-$ 565,463	$ 346,352
10	1930	Transportation Equipment - small trucks	$ 1,745,055	$ 118,221	$ -	$ 1,863,275	-$ 1,461,620	-$ 67,240	$ -	-$ 1,528,860	$ 334,415
10	1930	Transportation Equipment - workplatform	$ 6,643,811	$ 331,018	$ -	$ 6,974,828	-$ 3,844,434	-$ 485,378	$ -	-$ 4,329,813	$ 2,645,016
10	1930	Transportation Equipment - Hybrid system	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1935	Stores Equipment	$ 697,911	$ -	$ -	$ 697,911	-$ 554,056	-$ 52,293	$ -	-$ 606,349	$ 91,562
8	1940	Tools, Shop & Garage Equipment	$ 354,449	$ 17,500	$ -	$ 371,949	-$ 321,883	-$ 9,131	$ -	-$ 331,013	$ 40,936
8	1940	Truck tools	$ 1,334,921	$ 17,500	$ -	$ 1,352,421	-$ 1,229,713	-$ 45,260	$ -	-$ 1,274,973	$ 77,448
8	1945	Measurement & Testing Equipment	$ 1,038,278	$ -	$ -	$ 1,038,278	-$ 959,077	-$ 20,324	$ -	-$ 979,401	$ 58,877
8	1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1955	Communications Equipment - phones	$ 236,172	$ -	$ -	$ 236,172	-$ 52,853	-$ 23,617	$ -	-$ 76,470	$ 159,702
8	1955	Communications Equipment - Radio wireless	$ 222,164	$ -	$ -	$ 222,164	-$ 195,718	-$ 6,800	$ -	-$ 202,517	$ 19,647
8	1955	Communications Equipment - Radio	$ 177,491	$ -	$ -	$ 177,491	-$ 166,885	-$ 6,952	$ -	-$ 173,838	$ 3,654
8	1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1960	Miscellaneous Equipment	$ 2,715,403	$ 194,100	$ -	$ 2,909,503	-$ 2,527,365	-$ 120,720	$ -	-$ 2,648,085	$ 261,418
47	1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1980	System Supervisor Equipment	$ 6,218,233	$ 230,764	$ -	$ 6,448,997	-$ 3,869,469	-$ 288,843	$ -	-$ 4,158,312	$ 2,290,685
47	1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1995	Contributions & Grants	-$ 31,831,420	$ -	$ -	-$ 31,831,420	$ 13,399,915	$ 734,912	$ -	$ 14,134,827	-$ 17,696,593
47	2440	Deferred Revenue - 1808 [5]	-$ 24,595	$ -	$ -	-$ 24,595	$ 6,147	$ 1,228	$ -	$ 7,375	-$ 17,220
47	2440	Deferred Revenue - 1830 [5]	-$ 2,247,348	-$ 254,391	$ -	-$ 2,501,739	$ 182,689	$ 55,594	$ -	$ 238,283	-$ 2,263,456
47	2440	Deferred Revenue - 1835 [5]	-$ 1,278,033	-$ 143,829	$ -	-$ 1,421,862	$ 103,770	$ 31,597	$ -	$ 135,367	-$ 1,286,495
47	2440	Deferred Revenue - 1840 [5]	-$ 3,849,172	-$ 123,283	$ -	-$ 3,972,454	$ 296,056	$ 79,449	$ -	$ 375,505	-$ 3,596,949
47	2440	Deferred Revenue - 1845 [5]	-$ 9,377,173	-$ 316,357	$ -	-$ 9,693,530	$ 1,022,943	$ 276,958	$ -	$ 1,299,901	-$ 8,393,629
47	2440	Deferred Revenue - 1850 [5]	-$ 9,413,578	-$ 830,216	$ -	-$ 10,243,794	$ 890,018	$ 269,574	$ -	$ 1,159,592	-$ 9,084,203
47	2440	Deferred Revenue - 1855 [5]	-$ 2,226,757	-$ 359,280	$ -	-$ 2,586,037	$ 150,848	$ 52,776	$ -	$ 203,624	-$ 2,382,413
47	2440	Deferred Revenue - 1860 [5]	-$ 120,207	-$ 38,449	$ -	-$ 158,656	$ 21,784	$ 10,577	$ -	$ 32,361	-$ 126,295
	2005	Property Under Finance Lease [7]	0	0	$ -	$ -	$ -			$ -	$ -
		Sub-Total	**$ 394,222,378**	**$ 19,144,734**	**$ -**	**$ 413,367,112**	**-$ 176,974,559**	**-$ 10,663,695**	**$ -**	**-$ 187,638,254**	**$ 225,728,858**
		Less Socialized Renewable Energy Generation Investments (input as negative)				$ -				$ -	$ -
		Less Other Non Rate-Regulated Utility Assets (input as negative)				$ -				$ -	$ -
		Total PP&E	**$ 394,222,378**	**$ 19,144,734**	**$ -**	**$ 413,367,112**	**-$ 176,974,559**	**-$ 10,663,695**	**$ -**	**-$ 187,638,254**	**$ 225,728,858**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable [6]						0			
		Total						**-$ 10,663,695**			

			Less: *Fully Allocated Depreciation*	
10	1930&1940	Transportation	Transportation	-$ 654,837
8	1935	Stores Equipment	Stores Equipment	-$ 52,293
47	2440	Deferred Revenue	Deferred Revenue	$ 777,753
			Net Depreciation	-$10,734,319

				Accounting Standard	MIFRS
				Year	2021

CCA Class [2]	OEB Account [3]	Description [3]	Cost: Opening Balance	Cost: Additions [4]	Cost: Disposals [6]	Cost: Closing Balance	Accumulated Depreciation: Opening Balance	Accumulated Depreciation: Additions	Accumulated Depreciation: Disposals [6]	Accumulated Depreciation: Closing Balance	Net Book Value
	1609	Capital Contributions Paid	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
12	1611	Computer Software (Formally known as Account 1925)	$ 9,980,273	$ 565,477	$ -	$ 10,545,751	-$ 7,921,613	-$ 741,663	$ -	-$ 8,663,276	$ 1,882,475
12	1611	Computer Software (Formally known as Account 1925) - CIS/ERP	$ 1,884,075	$ -	$ -	$ 1,884,075	-$ 708,495	-$ 188,408	$ -	-$ 896,902	$ 987,173
CEC	1612	Land Rights (Formally known as Account 1906)	$ 1,209,544	$ 85,149	$ -	$ 1,294,693	$ -	$ -	$ -	$ -	$ 1,294,693
N/A	1805	Land	$ 2,300,541	$ -	$ -	$ 2,300,541	$ -	$ -	$ -	$ -	$ 2,300,541
47	1808	Buildings - MS	$ 278,998	$ 9,059	$ -	$ 288,057	-$ 179,780	-$ 5,526	$ -	-$ 185,306	$ 102,751
47	1808	Buildings - TS	$ 4,824,514	$ 310,046	$ -	$ 5,134,560	-$ 1,433,705	-$ 82,336	$ -	-$ 1,516,040	$ 3,618,520
47	1808	Buildings & Fixtures - Service Centre	$ 20,511,527	$ -	$ -	$ 20,511,527	-$ 3,620,677	-$ 403,647	$ -	-$ 4,024,325	$ 16,487,202
47	1808	Service Centre - Parking Lot & Fence	$ 816,364	$ -	$ -	$ 816,364	-$ 284,352	-$ 34,377	$ -	-$ 318,729	$ 497,634
47	1808	Service Centre - HVAC	$ 4,273,493	$ -	$ -	$ 4,273,493	-$ 2,532,839	-$ 316,220	$ -	-$ 2,849,059	$ 1,424,434
47	1808	Service Centre - Roof	$ 613,985	$ -	$ -	$ 613,985	-$ 279,935	-$ 33,345	$ -	-$ 313,280	$ 300,705
47	1808	Service Centre - Automation	$ 50,290	$ -	$ -	$ 50,290	-$ 28,246	-$ 3,481	$ -	-$ 31,727	$ 18,563
47	1808	Operation Centre - Workshop	$ 61,364	$ -	$ -	$ 61,364	-$ 57,241	-$ 150	$ -	-$ 57,391	$ 3,973
13	1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1815	Transformer Station Equipment >50 kV	$ 16,484,255	$ 707,668	$ -	$ 17,191,923	-$ 11,922,110	-$ 487,092	$ -	-$ 12,409,203	$ 4,782,720
47	1815	TSE Auxiliary equipment	$ 2,632,161	$ -	$ -	$ 2,632,161	-$ 816,367	-$ 91,421	$ -	-$ 907,789	$ 1,724,372
47	1815	TSE - P&C equipment	$ 4,049,798	$ -	$ -	$ 4,049,798	-$ 2,335,029	-$ 285,613	$ -	-$ 2,620,642	$ 1,429,157
47	1815	TSE - Power transformer	$ 12,425,189	$ -	$ -	$ 12,425,189	-$ 3,684,928	-$ 245,883	$ -	-$ 3,930,811	$ 8,494,378
47	1820	Distribution Station Equipment <50 kV	$ 5,287,844	$ 97,391	$ -	$ 5,385,235	-$ 3,308,864	-$ 79,291	$ -	-$ 3,388,154	$ 1,997,080
47	1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1830	Poles, Towers & Fixtures	$ 92,331,866	$ 3,744,396	$ -	$ 96,076,261	-$ 33,520,004	-$ 1,760,496	$ -	-$ 35,280,501	$ 60,795,761
47	1835	Overhead Conductors & Devices	$ 48,179,567	$ 1,930,081	$ -	$ 50,109,648	-$ 15,233,933	-$ 947,266	$ -	-$ 16,181,199	$ 33,928,448
47	1835	OH Manual line switches	$ 1,637,997	$ -	$ -	$ 1,637,997	-$ 301,294	-$ 54,600	$ -	-$ 355,894	$ 1,282,104
47	1835	OH SCADA control equipment	$ 2,783,596	$ -	$ -	$ 2,783,596	-$ 1,069,176	-$ 203,718	$ -	-$ 1,272,894	$ 1,510,702
47	1840	Underground Conduit	$ 27,443,543	$ 1,117,242	$ -	$ 28,560,785	-$ 10,292,332	-$ 448,387	$ -	-$ 10,740,719	$ 17,820,066
47	1845	Underground Conductors & Devices	$ 62,644,198	$ 2,215,447	$ -	$ 64,859,645	-$ 26,611,297	-$ 1,492,022	$ -	-$ 28,103,319	$ 36,756,326
47	1850	Line Transformers - Overhead	$ 37,782,477	$ 2,066,358	$ -	$ 39,848,836	-$ 17,373,271	-$ 636,457	$ -	-$ 18,009,728	$ 21,839,108
47	1850	Line Transformers - Underground	$ 35,839,583	$ 2,625,718	$ -	$ 38,465,301	-$ 13,208,728	-$ 1,000,297	$ -	-$ 14,209,024	$ 24,256,277
47	1855	Services - Overhead	$ 11,467,171	$ 386,717	$ -	$ 11,853,888	-$ 5,912,196	-$ 177,375	$ -	-$ 6,089,571	$ 5,764,317
47	1855	Services - Underground	$ 20,525,394	$ 728,300	$ -	$ 21,253,694	-$ 8,961,847	-$ 313,832	$ -	-$ 9,275,679	$ 11,978,015
47	1860	Meters - Bidirectional	$ 93,991	$ -	$ -	$ 93,991	-$ 18,917	-$ 3,760	$ -	-$ 22,677	$ 71,314
47	1860	Meters - Commercial	$ 2,859,089	$ -	$ -	$ 2,859,089	-$ 2,287,548	-$ 125,850	$ -	-$ 2,413,398	$ 445,691
47	1860	Meters - Residential	$ 2,570,142	$ 330,339	$ -	$ 2,900,481	-$ 779,909	-$ 183,534	$ -	-$ 963,443	$ 1,937,038
47	1860	Meters C& I	$ 2,867,480	$ 334,260	$ -	$ 3,201,740	-$ 833,732	-$ 213,489	$ -	-$ 1,047,222	$ 2,154,518
47	1860	Meters (Smart Meters)	$ 7,709,608	$ -	$ -	$ 7,709,608	-$ 5,804,181	-$ 536,249	$ -	-$ 6,340,430	$ 1,369,178
47	1860	Meters (Wholesale)	$ 1,091,045	$ 6,089	$ -	$ 1,097,134	-$ 659,572	-$ 40,758	$ -	-$ 700,329	$ 396,805
N/A	1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (10 years)	$ 1,759,306	$ 131,500	$ -	$ 1,890,806	-$ 1,553,845	-$ 66,180	$ -	-$ 1,620,025	$ 270,781
8	1915	Office Furniture & Equipment (5 years)	$ 114,282	$ -	$ -	$ 114,282	-$ 74,408	-$ 19,353	$ -	-$ 93,762	$ 20,520
10	1920	Computer Equipment - Hardware	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
50	1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ 5,174,684	$ 224,935	$ -	$ 5,399,619	-$ 4,702,462	-$ 211,298	$ -	-$ 4,913,760	$ 485,859
10	1930	Transportation Equipment - car	$ 37,162	$ -	$ -	$ 37,162	-$ 37,162	$ -	$ -	-$ 37,162	$ -
10	1930	Transportation Equipment - Other - trailers etc	$ 911,815	$ 54,912	$ -	$ 966,726	-$ 565,463	-$ 50,151	$ -	-$ 615,614	$ 351,112
10	1930	Transportation Equipment - small trucks	$ 1,863,275	$ 274,558	$ -	$ 2,137,833	-$ 1,528,860	-$ 95,922	$ -	-$ 1,624,782	$ 513,051
10	1930	Transportation Equipment - workplatform	$ 6,974,828	$ 768,762	$ -	$ 7,743,590	-$ 4,329,813	-$ 498,822	$ -	-$ 4,828,635	$ 2,914,956
10	1930	Transportation Equipment - Hybrid system	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1935	Stores Equipment	$ 697,911	$ 130,000	$ -	$ 827,911	-$ 606,349	-$ 31,720	$ -	-$ 638,069	$ 189,842
8	1940	Tools, Shop & Garage Equipment	$ 371,949	$ 19,000	$ -	$ 390,949	-$ 331,013	-$ 10,203	$ -	-$ 341,217	$ 49,733
8	1940	Truck tools	$ 1,352,421	$ 19,000	$ -	$ 1,371,421	-$ 1,274,973	-$ 37,669	$ -	-$ 1,312,642	$ 58,779
8	1945	Measurement & Testing Equipment	$ 1,038,278	$ -	$ -	$ 1,038,278	-$ 979,401	-$ 15,154	$ -	-$ 994,555	$ 43,723
8	1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1955	Communications Equipment - phones	$ 236,172	$ -	$ -	$ 236,172	-$ 76,470	-$ 23,617	$ -	-$ 100,087	$ 136,084
8	1955	Communications Equipment - Radio wireless	$ 222,164	$ -	$ -	$ 222,164	-$ 202,517	-$ 6,549	$ -	-$ 209,066	$ 13,098
8	1955	Communications Equipment - Radio	$ 177,491	$ -	$ -	$ 177,491	-$ 173,838	-$ 2,387	$ -	-$ 176,225	$ 1,267
8	1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1960	Miscellaneous Equipment	$ 2,909,503	$ 119,200	$ -	$ 3,028,703	-$ 2,648,085	-$ 52,396	$ -	-$ 2,700,481	$ 328,222
47	1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1980	System Supervisor Equipment	$ 6,448,997	$ 274,317	$ -	$ 6,723,314	-$ 4,158,312	-$ 301,323	$ -	-$ 4,459,635	$ 2,263,679
47	1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1995	Contributions & Grants	-$ 31,831,420	$ -	$ -	-$ 31,831,420	$ 14,134,827	$ 734,273	$ -	$ 14,869,100	-$ 16,962,320
47	2440	Deferred Revenue - 1808[5]	-$ 24,595	$ -	$ -	-$ 24,595	$ 7,375	$ 1,228	$ -	$ 8,603	-$ 15,992
47	2440	Deferred Revenue - 1830[5]	-$ 2,501,739	-$ 179,247	$ -	-$ 2,680,986	$ 238,283	$ 59,577	$ -	$ 297,861	-$ 2,383,126
47	2440	Deferred Revenue - 1835[5]	-$ 1,421,862	-$ 101,344	$ -	-$ 1,523,206	$ 135,367	$ 33,849	$ -	$ 169,216	-$ 1,353,990
47	2440	Deferred Revenue - 1840[5]	-$ 3,972,454	-$ 278,040	$ -	-$ 4,250,494	$ 375,505	$ 85,010	$ -	$ 460,515	-$ 3,789,979
47	2440	Deferred Revenue - 1845[5]	-$ 9,693,530	-$ 690,984	$ -	-$ 10,384,514	$ 1,299,901	$ 296,700	$ -	$ 1,596,601	-$ 8,787,913
47	2440	Deferred Revenue - 1850[5]	-$ 10,243,794	-$ 994,187	$ -	-$ 11,237,982	$ 1,159,592	$ 295,736	$ -	$ 1,455,328	-$ 9,782,654
47	2440	Deferred Revenue - 1855[5]	-$ 2,586,037	-$ 357,363	$ -	-$ 2,943,400	$ 203,624	$ 60,069	$ -	$ 263,694	-$ 2,679,707
47	2440	Deferred Revenue - 1860[5]	-$ 158,656	-$ 41,229	$ -	-$ 199,886	$ 32,361	$ 13,381	$ -	$ 45,742	-$ 154,144
	2005	Property Under Finance Lease[7]	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
		Sub-Total	**$ 413,367,112**	**$ 16,633,526**	**$ -**	**$ 430,000,639**	**-$ 187,638,254**	**-$ 10,979,464**	**$ -**	**-$ 198,617,718**	**$ 231,382,921**
		Less Socialized Renewable Energy Generation Investments (input as negative)				$ -				$ -	$ -
		Less Other Non Rate-Regulated Utility Assets (input as negative)				$ -				$ -	$ -
		Total PP&E	**$ 413,367,112**	**$ 16,633,526**	**$ -**	**$ 430,000,639**	**-$ 187,638,254**	**-$ 10,979,464**	**$ -**	**-$ 198,617,718**	**$ 231,382,921**
		Depreciation Expense adj. from gain or loss on the retirement of assets (pool of like assets), if applicable[6]						0			
		Total						**-$ 10,979,464**			

			Less: *Fully Allocated Depreciation*	
10	1930&1940	Transportation	Transportation	-$ 692,768
8	1935	Stores Equipment	Stores Equipment	-$ 31,720
47	2440	Deferred Revenue	Deferred Revenue	$ 845,551
			Net Depreciation	-$11,100,528

Notes:

1 Tables in the format outlined above covering all fixed asset accounts should be submitted for the Test Year, Bridge Year and all relevant historical years. At a minimum , the applicant must provide data for the earlier of: 1) all historical years back to its last rebasing; or 2) at least three years of historical actuals, in addition to Bridge Year and Test Year forecasts.

2 The "CCA Class" for fixed assets should generally agree with the CCA Class used for tax purposes in Tax Returns. Fixed Assets sub-components may be used where the underlying asset components are classified under multiple CCA Classes for tax purposes. If an applicant uses any different classes from those shown in the table, an explanation should be provided. (also see note 3).

3 The table may need to be customized for a utility's asset categories or for any new asset accounts announced or authorized by the OEB.

4 The additions in column (E) must not include construction work in progress (CWIP).

5 Effective on the date of IFRS adoption, customer contributions will no longer be recorded in Account 1995 Contributions & Grants, but will be recorded in Account 2440, Deferred Revenues. Amortization of deferred revenue will be removed from the depreciation expense shown on this fixed asset continuity schedule as it should be included as income in Appendix 2-H Other Revenues.

6 The applicant must ensure that all asset disposals have been clearly identified in the Chapter 2 Appendices for all historic, bridge and test years. Where a distributor for general financial reporting purposes under IFRS has accounted for the amount of gain or loss on the retirement of assets in a pool of like assets as a charge or credit to income, for reporting and rate application filings, the distributor shall reclassify such gains and losses as depreciation expense, and disclose the amount separately.

7 This account includes the amount recorded under finance leases for plant leased from others and used by the utility in its utility operations.

File Number:	EB-2020-0059
Exhibit:	2
Tab:	
Schedule:	Table 2-38
Page:	72
Date:	30-Jun-20

Appendix 2-D
Overhead Expense

Applicants are to provide a breakdown of OM&A before capitalization in the below table. OM&A before capitalization may be broken down by cost center, program, drivers or another format best suited to focus on capitalized vs. uncapitalized OM&A.

OM&A Before Capitalization	**2016 Historical Year**	**2017 Historical Year**	**2018 Historical Year**	**2019 Historical Year**	**2020 Bridge Year**	**2021 Test Year**
Distribution Expenses - Operation & Maintenance	$ 10,318,101	$ 10,378,566	$ 10,498,644	$ 10,409,671	$ 10,487,222	$ 10,857,287
Billing and Collecting	$ 2,728,245	$ 2,823,342	$ 3,100,765	$ 2,966,160	$ 3,008,184	$ 3,137,007
Community Relations	$ 104,616	$ 129,492	$ 200,330	$ 244,189	$ 347,738	$ 508,564
Administrative and General Expenses	$ 2,584,121	$ 3,054,727	$ 3,222,494	$ 3,482,548	$ 3,778,758	$ 3,869,654
Total OM&A Before Capitalization (B)	$ 15,735,083	$ 16,386,126	$ 17,022,234	$ 17,102,568	$ 17,621,902	$ 18,372,512

Applicants are to provide a breakdown of capitalized OM&A in the below table. Capitalized OM&A may be broken down using the categories listed in the table below if possible. Otherwise, applicants are to provide its own break down of capitalized OM&A.

Capitalized OM&A	**2016 Historical Year**	**2017 Historical Year**	**2018 Historical Year**	**2019 Historical Year**	**2020 Bridge Year**	**2021 Test Year**	**Directly Attributable? (Yes/No)**	**Explanation for Change in Overhead Capitalized**
employee benefits	$ 1,592,811	$ 1,489,559	$ 1,410,750	$ 1,476,295	$ 1,332,880	$ 1,419,210	Yes	Directly attributable to labour costs charged to capital
costs of site preparation								
initial delivery and handling costs	$ 155,683	$ 153,818	$ 146,601	$ 152,638	$ 148,000	$ 129,000	Yes	Directly attributable to labour & equipment costs charged to capital
costs of testing whether the asset is functioning properly								
professional fees								
	$ 1,206,787	$ 1,176,881	$ 956,176	$ 1,014,035	$ 1,099,293	$ 1,095,245	Yes	Directly attributable to labour & equipment costs charged to capital
costs of opening a new facility								
costs of introducing a new product or service (including costs of advertising and promotional activities)								
costs of conducting business in a new location or with a new class of customer (including costs of staff training)								
administration and other general overhead costs								
Insert description of additional item(s) and new rows if needed								
Total Capitalized OM&A (A)	$ 2,955,281	$ 2,820,259	$ 2,513,527	$ 2,642,967	$ 2,580,173	$ 2,643,455		

% of Capitalized OM&A (=A/B)	19%	17%	15%	15%	15%	14%		

File Number:	EB-2020-0059
Exhibit:	2
Tab:	
Schedule:	Table 2-40
Page:	75
Date:	30-Jun-20

Appendix 2-G
Service Reliability and Quality Indicators

Service Reliability

Index	Including outages caused by loss of supply					Excluding outages caused by loss of supply					Excluding Major Event Days				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
SAIDI	1.053	2.867	0.863	2.086	1.126	0.893	2.601	0.860	1.833	1.079	0.688	0.709	0.761	0.918	0.850
SAIFI	1.787	2.986	1.612	1.862	1.839	1.593	2.624	1.582	1.645	1.443	1.436	1.145	1.497	1.318	1.287

5 Year Historical Average

	Including outages caused by loss of supply	Excluding outages caused by loss of supply	Excluding Major Event Days
SAIDI	1.599	1.453	0.785
SAIFI	2.017	1.777	1.337

SAIDI = System Average Interruption Duration Index
SAIFI = System Average Interruption Frequency Index

Service Quality

Indicator	OEB Minimum Standard	2015	2016	2017	2018	2019
Low Voltage Connections	90.0%	100.0%	100.0%	100.0%	100.0%	100.0%
High Voltage Connections	90.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Telephone Accessibility	65.0%	88.1%	86.7%	72.8%	92.7%	90.7%
Appointments Met	90.0%	100.0%	98.1%	96.4%	99.3%	98.6%
Written Response to Enquires	80.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Emergency Urban Response	80.0%	100.0%	100.0%	96.6%	94.9%	92.1%
Emergency Rural Response	80.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Telephone Call Abandon Rate	10.0%	4.1%	4.6%	3.7%	1.0%	0.6%
Appointment Scheduling	90.0%	99.6%	99.9%	99.6%	99.8%	84.4%
Rescheduling a Missed Appointment	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Reconnection Performance Standard	85.0%	100.0%	100.0%	100.0%	100.0%	100.0%

File Number:	EB-2020-0059
Exhibit:	2
Tab:	
Schedule:	Table 2-28
Page:	46
Date:	30-Jun-20

Commodity Expense

Step 1: **2021 Forecasted Commodity Prices**

Forecasted Commodity Prices

Table 1: Average RPP Supply Cost Summary*

			non-RPP	RPP
HOEP ($/MWh)	Load-Weighted Price for RPP Consumers		$20.09	$20.09
Global Adjustment ($/MWh)	Impact of the Global Adjustment		$106.94	$106.94
Adjustments ($/MWh)				$1.00
TOTAL ($/MWh)	Average Supply Cost for RPP Consumers			**$128.03**

Step 2: **Commodity Expense**

(volumes for the bridge and test year are loss adjusted)

Commodity

Customer		Revenue	Expense		2021 Test Year					
Class Name	UoM	USA #	USA #	Class A Non-RPP Volume**		Class B Non-RPP Volume**	Class B RPP Volume**	Average HOEP	Average RPP Rate	Amount
Residential	kWh	4006	4705			5,766,935	403,235,509	$ 0.02009	$ 0.12803	$51,742,100
General Service < 50 kW	kWh	4010	4705			18,486,202	183,991,361	$ 0.02009	$ 0.12803	$23,927,802
General Service > 50 to 4999 kW	kWh	4035	4705	217,110,653		423,876,941	71,220,844	$ 0.02009	$ 0.12803	$21,995,845
Large User	kWh	4010	4705	96,044,387				$ 0.02009	$ 0.12803	$1,929,532
Direct Market Participant	kWh	4025	4705			9,541,353				$0
Street Lights	kWh	4025	4705			3,465,902		$ 0.02009	$ 0.12803	$69,630
Unmetered Scattered Loads	kWh	4025	4705				3,051,147	$ 0.02009	$ 0.12803	$390,638
Embedded Distributor	kWh	4025	4705			42,008,402		$ 0.02009	$ 0.12803	$843,949
	kWh	4025	4705					$ 0.02009	$ 0.12803	$0
TOTAL				**313,155,040**		**503,145,733**	**661,498,861**			**$100,899,496**

Class A - non-RPP Global Adjustment

Customer		Revenue	Expense	Amount	kWh Volume	2021 Test Year			Hist. Avg GA/kWh ***	Amount
General Service > 50 to 4999 kW		4035	4707		217,110,653				0.080882777	$17,560,513
Large User		4010	4707		96,044,387				0.092879286	$8,920,534
		4010	4707							
				-	313,155,040					**$26,481,047**

Class B - non-RPP Global Adjustment

Customer		Revenue	Expense		2021 Test Year					Amount
Class Name	UoM	USA #	USA #			Class B Non-RPP Volume			GA Rate/kWh	
Residential	kWh	4006	4707			5,766,935			$ 0.10694	$616,716
General Service < 50 kW	kWh	4010	4707			18,486,202			$ 0.10694	$1,976,914
General Service > 50 to 4999 kW	kWh	4035	4707			423,876,941			$ 0.10694	$45,329,400
Large User	kWh	4010	4707			0			$ 0.10694	$0
Direct Market Participant	kWh	4025	4707			9,541,353				$0
Street Lights	kWh	4025	4707			3,465,902			$ 0.10694	$370,644
Unmetered Scattered Loads	kWh	4025	4707			0			$ 0.10694	$0
Embedded Distributor	kWh	4025	4707			42,008,402			$ 0.10694	$4,492,378
Total Volume						**503,145,733**				
TOTAL										**$52,786,052**

*Regulated Price Plan Prices for the Period November 1, 2019 – October 31, 2020

** Enter 2020 load forecast data by class based on the most recent 12-month historic Class A and Class B RPP/Non-RPP proportions

*** Based on average $ GA per kWh billed to class A customers for most recent 12-month historical year.

Cost of Power Calculation

File Number:	EB-2020-0059
Exhibit:	2
Tab:	
Schedule:	Table 2-28
Page:	46
Date:	30-Jun-20

All Volume should be loss adjusted with the exception of:
* Volume loss adjusted less WMP
** No loss adjustment for kWh

		2021 Test Year	RPP		2021 Test Year	non-RPP		Total
Electricity Commodity	Units	Volume	Rate	$	Volume	Rate	$	$
Class per Load Forecast				-				
Residential	kWh	403,235,509		51,626,242	5,766,935		115,858	
General Service < 50 kW	kWh	183,991,361		23,556,414	18,486,202		371,388	
General Service > 50 to 4999 kW	kWh*	71,220,844		9,118,405	640,987,594		12,877,441	
Large User	kWh*	0		-	96,044,387		1,929,532	
Direct Market Participant	kWh	0		-	9,541,353		-	
Street Lights	kWh	0		-	3,465,902		69,630	
Unmetered Scattered Loads	kWh	3,051,147		390,638	0		-	
Embedded Distributor	kWh	0		-	42,008,402		843,949	
SUB-TOTAL		661,498,861		84,691,699	816,300,773		16,207,797	$ 100,899,496

Global Adjustment non-RPP	Units	Volume	Rate	$	Volume	Rate	$	Total
Class per Load Forecast								
Residential				0			616,716	
General Service < 50 kW				0			1,976,914	
General Service > 50 to 4999 kW				0			62,889,913	
Large User				0			8,920,534	
Direct Market Participant				0			-	
Street Lights				0			370,644	
Unmetered Scattered Loads				0			-	
Embedded Distributor							4,492,378	
SUB-TOTAL		0		0			79,267,099	$ 79,267,099

Transmission - Network		Volume	Rate	$	Volume	Rate	$	Total
Class per Load Forecast								
Residential	kWh	403,235,509	0.0071	2,865,384	5,766,935	0.0071	40,980	
General Service < 50 kW	kWh	183,991,361	0.0066	1,217,889	18,486,202	0.0066	122,365	
General Service > 50 to less tha	kW	175,506	2.7039	474,546	429,792	2.7039	1,162,103	
General Service > 50 - Interval M	kW	73,261	2.8720	210,404	592,314	2.8720	1,701,117	
General Service > 50 - Interval M	kW	-	2.8681	-	470,812	2.8681	1,350,333	
Large User	kW	-	3.1797	-	169,287	3.1797	538,279	
Direct Market Participant	kW		2.8720	-	22,951	2.8720	65,915	
Street Lights	kW		2.0393	-	9,302	2.0393	18,970	
Unmetered Scattered Loads	kWh	3,051,147	0.0066	20,196		0.0066	-	
SUB-TOTAL				4,788,420			5,000,062	9,788,482

Transmission - Connection								
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh	403,235,509	0.0025	1,021,100	5,766,935	0.0025	14,603	
General Service < 50 kW	kWh	183,991,361	0.0023	430,076	18,486,202	0.0023	43,211	
General Service > 50 to less tha	kW	175,506	0.8817	154,746	429,792	0.8817	378,954	
General Service > 50 - Interval M	kW	73,261	1.1011	80,671	592,314	1.1011	652,224	
General Service > 50 - Interval M	kW	-	1.1001	-	470,812	1.1001	517,929	
Large User	kW	-	1.1050	-	169,287	1.1050	187,069	
Direct Market Participant	kW	-	1.1011	-	22,951	1.1011	25,272	
Street Lights	kW	-	0.6814	-	9,302	0.6814	6,338	
Unmetered Scattered Loads	kWh	3,051,147	0.0023	7,132	-	0.0023	-	
SUB-TOTAL				1,693,725			1,825,602	3,519,327

Wholesale Market Service								
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh	403,235,509	0.003	1,209,707	5,766,935	0.003	17,301	
General Service < 50 kW	kWh	183,991,361	0.003	551,974	18,486,202	0.003	55,459	
General Service > 50 to 4999 kV	kWh*	71,220,844	0.003	213,663	640,987,594	0.003	1,922,963	
Large User	kWh*		0.003	-	96,044,387	0.003	288,133	
Direct Market Participant	kWh*		-	-	9,541,353	-	-	
Street Lights	kWh		0.003	-	3,465,902	0.003	10,398	
Unmetered Scattered Loads	kWh	3,051,147	0.003	9,153	-	0.003	-	
Embedded Distributor	kWh		0.003		42,008,402	0.003	126,025	
SUB-TOTAL				1,984,497			2,420,278	4,404,775

Class A CBR								
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh			-			-	
General Service < 50 kW	kWh			-			-	
General Service > 50 to 4999 kV	kWh*			-	217,110,653	0.000258	56,055	
Large User	kWh*			-	96,044,387	0.000258	24,797	
Direct Market Participant				-			-	
Street Lights				-			-	
Unmetered Scattered Loads				-			-	
SUB-TOTAL				-			80,852	80,852

RRRP								
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh	403,235,509	0.0005	201,618	5,766,935	0.0005	2,883	
General Service < 50 kW	kWh	183,991,361	0.0005	91,996	18,486,202	0.0005	9,243	
General Service > 50 to 4999 kV	kWh	71,220,844	0.0005	35,610	640,987,594	0.0005	320,494	
Large User	kWh	-	0.0005	-	96,044,387	0.0005	48,022	
Direct Market Participant	kWh	-	-	-	9,541,353	-	-	
Street Lights	kWh	-	0.0005	-	3,465,902	0.0005	1,733	
Unmetered Scattered Loads	kWh	3,051,147	0.0005	1,526	-	0.0005	-	
Embedded Distributor	kWh	-	0.0005		42,008,402	0.0005	21,004	
SUB-TOTAL				330,749			403,380	734,129

Low Voltage - No TLF adjustmer								
Class per Load Forecast		Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh**	389,486,631	0.0004	137,182	5,570,303	0.0004	1,962	
General Service < 50 kW	kWh**	177,717,918	0.0003	57,780	17,855,889	0.0003	5,805	
General Service > 50 to 4999 kW	kW	248,767	0.1226	30,508	1,492,918	0.1226	183,088	
Large User	kW	-	0.1537	-	169,287	0.1537	26,019	
Direct Market Participant	kW	-	0.1226	-	22,951	0.1226	2,815	
Street Lights	kWh**	-	0.0948	-	9,302	0.0948	882	
Unmetered Scattered Loads	kWh**	2,947,114	0.0003	958	-	0.0003	-	
SUB-TOTAL				226,429			220,571	447,000

Smart Meter Entity Charge								
Class per Load Forecast		Customers	Rate	$	Customers	Rate	$	Total
Residential		50,989	0.57	348,765	729	0.57	4,986	
General Service < 50 kW		5,442	0.57	37,223	547	0.57	3,741	
Seasonal				-				
SUB-TOTAL				385,988			8,728	394,716
SUB- TOTAL				94,101,507			105,434,369	199,535,876
ORECA CREDIT	31.80%			(29,924,279)			0	(29,924,279)
TOTAL				**64,177,228**			**105,434,369**	**169,611,597**

***The ORECA Credit of 31.8% will only apply to RPP proportion of the listed components. Impacts on distribution charges are excluded for the purpose of calculating the cost of power.

**** Class A CBR: use the average CBR per kWh, similar to how the Class A GA cost is calculated

2021 Test Year - CoP	
4705 -Power Purchased	$ 100,899,496
4707- Global Adjustment	$ 79,267,099
4708-Charges-WMS	$ 5,219,756
4714-Charges-NW	$ 9,788,482
4716-Charges-CN	$ 3,519,327
4750-Charges-LV	$ 447,000
4751-IESO SME	$ 394,716
Misc A/R or A/P	$ (29,924,279)
TOTAL	**$ 169,611,597**

-

Waterloo North Hydro

ATTACHMENT 2-2

DISTRIBUTION SYSTEM PLAN (DSP)

Waterloo North Hydro Inc.

Distribution System Plan

2021 Cost of Service Application

Historical Period: 2016 – 2020
Forecast Period: 2021 - 2025

June 23, 2020

(Page Intentionally left blank)

CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICIES

Appendix A - WNH Asset Condition Assessment (ACA) Report

Appendix B - 2021 Material Capital Investments

Appendix C - KWCG IRRP Report (2015)

Appendix D - KWCG RIP Report (2015)

Appendix E - KWCG Needs Assessment Report (2018)

Appendix F - KWCG IRRP Scoping Assessment Outcome Report (2019)

Appendix G - KWCG Regional Planning Status Letter

Appendix H - WNH Renewable Energy Generation (REG) Investment Plan

Appendix I - IESO REG Letter of Comment

Appendix J - WNH System Supply and Capacity Study

Appendix K - WNH Distribution System Reliability Report

Appendix L - WNH Customer Engagement Reports

Appendix M - WNH Fleet Management Plan

Appendix N - WNH Information Technology Management Plan

Appendix O - WNH Facilities Management Plan

Appendix P - WNH Operations Maintenance Report

Appendix Q - OEB Appendix 5-A Unit Cost Metrics

Appendix R - OEB Chapter 2 Appendix 2-AA

GLOSSARY

1) ACA – Asset Condition Assessment
2) ACSR – Aluminum Conductor Steel-Reinforced
3) AM – Asset Management
4) AMI – Advanced Metering Infrastructure
5) AMP – Asset Management Process
6) BIL – Basic Impulse Level
7) CDM – Conservation and Demand Management
8) CAIDI – Customer Average Interruption Duration Index
9) CI – Customers Interrupted
10) CIS – Customer Information Systems
11) CHI – Customer Hours Interrupted
12) CMI – Customer Minutes of Interruption
13) CMIS – Customer Minutes of Interruption Saved
14) CSA – Canadian Standards Association
15) DG – Distributed Generation
16) DGA – Dissolved Gas Analysis
17) DS – Distribution Station
18) DSC – Distribution System Code
19) DSP – Distribution System Plan
20) EA – Environmental Assessment
21) EOL – End of Life
22) ESA – Electrical Safety Authority
23) FIT – Feed-In-Tariff
24) FLISR – Fault Location, Isolation and Service Restoration
25) GATR – Guelph Area Transmission Reinforcement
26) GEA - Green Energy Act
27) GIS – Geographic Information System
28) GS – General Service
29) HONI – Hydro One Networks Inc.

30) IESO – Independent Electricity System Operator
31) IRRP – Integrated Regional Resource Planning
32) IST – Information Systems and Technology
33) IT – Information Technology
34) KPI – Key Performance Indicator
35) kW - kilowatt
36) KWCG – Kitchener – Waterloo – Cambridge – Guelph
37) KWHI – Kitchener-Wilmot Hydro Inc.
38) LDC – Local Distribution Company
39) LDG – Load Displacement Generation
40) LEAP – Low-income Energy Assistance Program
41) LOS – Loss of Supply
42) LRT – Light Rail Transit
43) LTEP – Long Term Energy Plan
44) LTLT – Long Term Load Transfer
45) LTR – Limited Time Rating
46) MAIFI – Momentary Average Interruption Frequency Index
47) MED – Major Event Day
48) MTO - Ministry of Transportation of Ontario
49) NWA - Non-wires alternatives
50) O/H or OH - Overhead
51) O&M – Operation & Maintenance
52) O&M – Operation, Maintenance & Administration
53) ONAN - Oil Natural Air Natural
54) ONAF - Oil Natural Air Forced
55) ODS – Operational Data Store
56) OEB – Ontario Energy Board
57) OMS – Outage Management System
58) OPA – Ontario Power Authority
59) ORTAC – Ontario Resource and Transmission Assessment Criteria
60) OT – Operation Technology

61) PLM - Power Line Maintainer
62) PILAR – Power Interruption, Logging and Tracking
63) PSWHA – Public Service Works on Highways Act, R.S.O. 1990, c. P.49
64) PUCC – Public Utilities Coordinating Committee
65) REG – Renewable Energy Generation
66) RIP – Regional Infrastructure Planning
67) ROE – Return on Equity
68) RRFE – Renewed Regulatory Framework for Electricity Distributors
69) RTU – Remote Terminal Units
70) SAIDI – System Average Interruption Duration Index
71) SAIFI – System Average Interruption Frequency Index
72) SCADA – Supervisory Control and Data Acquisition
73) SEI – Serious Electrical Incidents
74) the Board – Ontario Energy Board
75) the City – City of Waterloo
76) the Region – Region of Waterloo
77) TPSS – Traction Power Substations
78) TRXLPE – Tree-Retardant Cross-Linked Polyethylene
79) TUL – Typical Useful Life
80) TS – Transmission Station or Transformer Station
81) U/G or UG – Underground
82) UCC – Utilities Coordinating Committee
83) ULTC – Under-Load Tap Changing
84) URD – Underground Residential Distribution
85) USF – Utilities Standards Forum
86) WNHI / WNH – Waterloo North Hydro Inc
87) XFMR – Transformer
88) XLPE – Cross-Linked Polyethylene

1. INTRODUCTION

1.1. Objectives & Scope of Work

Waterloo North Hydro Inc.'s (WNH) Distribution System Plan (DSP) provides a consolidated view of WNH's Asset Management Plan and Capital Investment Plan. The information contained herein is aligned with WNH's Mission, Vision and Strategic Imperatives. The DSP informs WNH's senior executive team (Executive) and aides in the development of WNH's Business Plans and Budgets. The DSP describes how WNH plans to develop, manage and maintain its major distribution and non-distribution system assets to provide a safe, secure, reliable, efficient and cost effective service to its customers.

This DSP has been prepared in accordance with the Ontario Energy Board's (OEB) Chapter 5 "Filing Requirements for Electricity Distribution Rate Applications, May 14th, 2020" (Chapter 5). WNH utilized the METSCO Energy Solutions Inc. (METSCO) Asset Analysis, Prioritization and Optimization Tool (ENGIN) and Health Index Frameworks in the preparation of this DSP. The DSP is designed to support the achievement of the four key OEB performance outcomes as established in the Renewed Regulatory Framework for Electricity (RRFE).

Customer Focus: services are provided in a manner that responds to identified customer preferences - WNH achieves this through everyday contact with customers, Biennial Customer Surveys and Customer Public Consultations.

Operational Effectiveness: continuous improvement in productivity and cost performance is achieved; and utilities deliver on system reliability and quality objectives - WNH has made investments in Grid Modernization to reduce customer outage minutes and improve asset utilization, and asset management tools to improve its asset investment decisions.

Public Policy Responsiveness: utilities deliver on obligations mandated by government (e.g., in legislation and in regulatory requirements imposed further to Ministerial directives to the Board) - WNH has a clear and consistent record in complying with all obligations and requirements in fulfilling its role as a Local Distribution Company in the Province of Ontario.

Financial Performance: financial viability is maintained; and savings from operational effectiveness are sustainable - WNH has a strong record of financial performance and has developed a sustainable investment plan articulated in this DSP.

The DSP spans a five-year historical period covering 2016 to 2020 and a five year forecast period covering 2021 to 2025. The Bridge Year and Test Year are 2020 and 2021 respectively. Historical and forecast investments, and asset replacement plans are described. The level of materiality for forecast capital investments has been established at $190,000.

This DSP has been prepared to support WNH's 2021 Cost of Service Application (Application). This is WNH's second DSP filing.

1.2. Outline of Report

WNH's DSP has been organized according to the recommended format contained within the OEB's Chapter 5 "Filing Requirements for Electricity Distribution Rate Applications, May 14, 2020" (Chapter 5). Cross references to Chapter 5 are provided in brackets () at all headings/subheadings within this report for ease of reference.

This report is divided into the following sections;

Section 1 - provides an introduction to WNH's DSP including an outline of the plan, description of the utility, background and drivers, objectives and scope of work.

Section 2 - provides an overview of WNH's DSP and describes the process employed in its development, i.e. stakeholder consultations, collaboration with municipal / regional governments and transmitters, performance measurements and monitoring metrics.

Section 3 - describes WNH's asset management process, prioritization and optimization processes; an overview of assets managed and asset performance and utilization.

Section 4 - documents historical and forecast Capital Expenditure Plan covering System Access, System Renewal, System Service and General Plant investment categories.

Appendices A through R provide additional information that supports this DSP.

1.3. Description of the Utility Company

1.3.1. Corporate Structure

WNH is an electrical Local Distribution Company (LDC) licensed by the OEB in accordance with its Distribution License ED-2002-0575. WNH provides electricity distribution services to approximately 58,000, customers in the City of Waterloo, the Township of Woolwich and the Township of Wellesley.

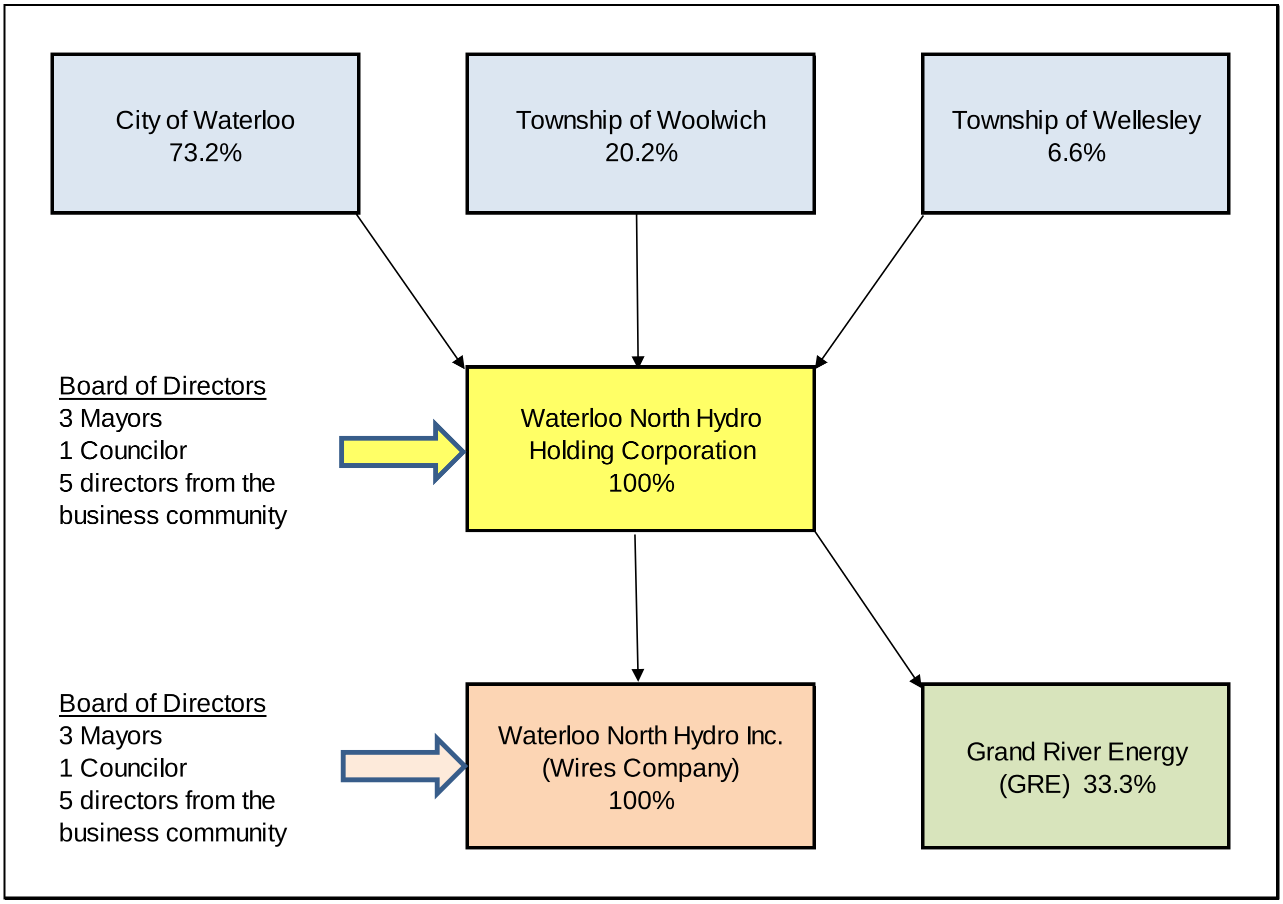
WNH is incorporated under the Ontario Business Corporations Act and is a subsidiary of Waterloo North Hydro Holding Company (WNHHC) whose shareholders are the City of Waterloo (73.2%), the Township of Woolwich (20.2%) and the Township of Wellesley (6.6%).

WNHHC also owns one-third (33.3%) of Grand River Energy Solutions Corporation (GRE). The other owners of GRE are Energy+ Inc. (33.3%) and Kitchener Power Corporation Inc. (33.3%). GRE is a generation and renewable energy solutions company whose mission is to help customers reach their energy management goals by tapping into the benefits of clean energy technologies such as solar, combined heat and power, electric vehicle integration, and carbon reduction goals.

The business affairs of WNHHC and WNH are managed by its respective Boards of Directors, each consisting of nine (9) Directors. The Shareholders appoint the directors to the WNHHC board. The WNHHC board appoints directors to the WNH board.

Figure 1-1 depicts WNH's ownership structure.

Figure 1-1: WNH Ownership Structure



1.3.2. Mission, Vision, Values & Strategic Imperatives

WNH's Mission, Vision, Corporate Values and Strategic Imperatives define the organization, how it operates and provides guidance in its strategic planning.

Mission

To be of service to our customers by delivering electricity to homes and businesses in our communities – reliably, safely, 24/7.

Vision

To be the flexible, sustainable distribution platform for connecting consumers and producers of electricity, and be the trusted energy advisor of choice for our customers.

Corporate Values

i) Respect - WNH is committed to treating others with respect and dignity.

ii) Commitment to Excellence - WNH strives for high reliability and quality through continuous improvement, leadership and excellence.

iii) Service - WNH recognizes its commitment to be of service to customers, employees and the community and its contribution to the success of each.

iv) Teamwork and Collaboration - WNH willingly shares information and best practices.

v) Safety and Environmental Stewardship - WNH is committed to its responsibility for the health and safety of employees, the protection of the public and safeguarding of the environment.

vi) Responsible and Accountable - WNH takes responsibility for the quality, reliability and timelines of its work and the work of others.

Strategic Imperatives

Each of the strategic imperatives is internally consistent with and contributes to achieving the corporate values outlined above.

1. Supply & Reliability
2. Health, Safety and Environment
3. Customer Service
4. Employee Relations and Development
5. Productivity and Cost Reduction
6. Organizational Effectiveness
7. Financial Performance
8. Shareholder and Community Relations
9. System Aesthetics

1.3.3. Service Area & Customer Demographics

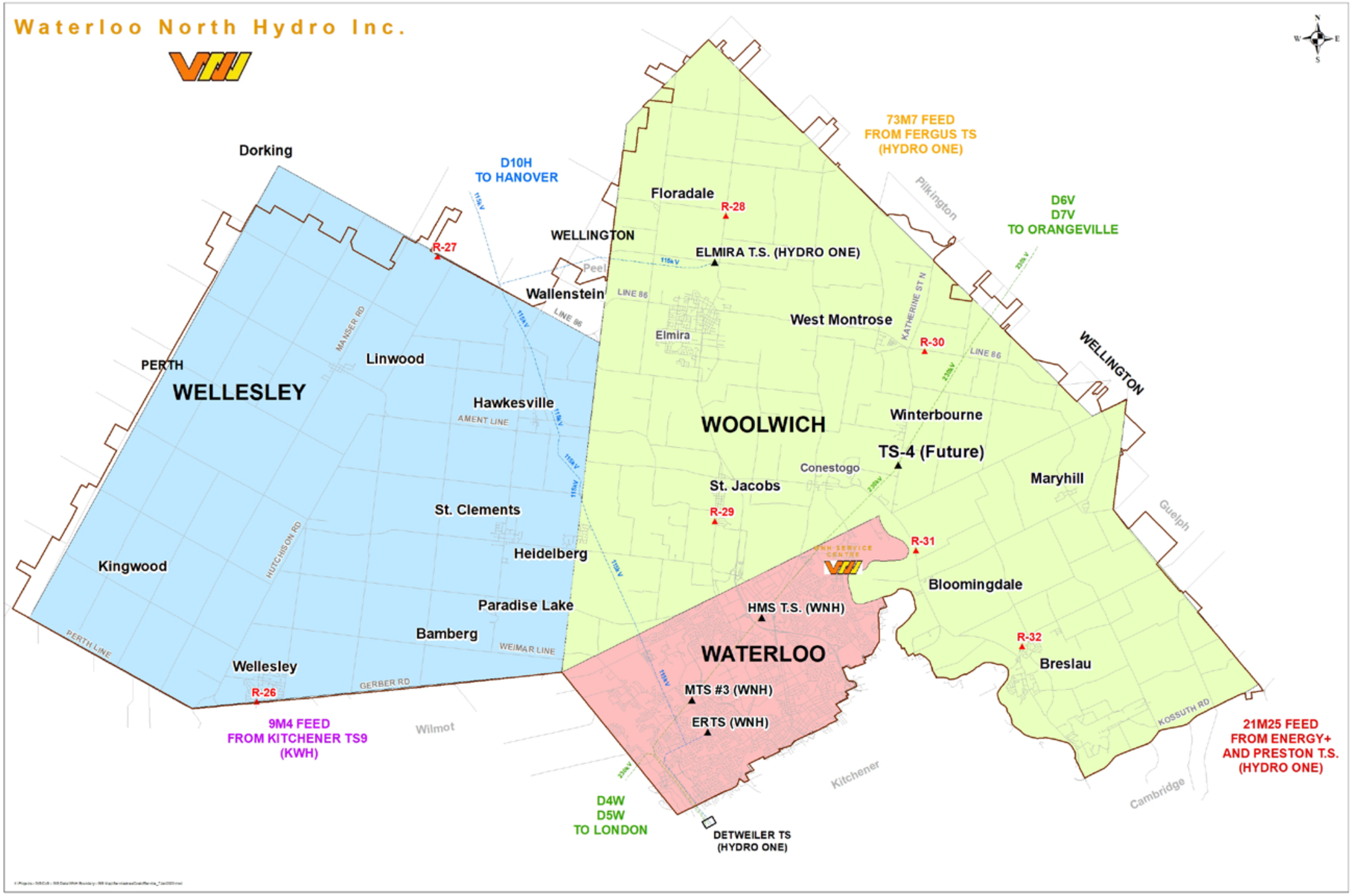
WNH is a medium sized Local Distribution Company (LDC) with predecessors dating back to 1905. WNH was created in 1979 as a result of Bill 55. Waterloo Public Utilities Commission and four other utilities were amalgamated creating a contiguous service territory of 672 sq. km within the Region of Waterloo (Region). The net assets and all employees of the former Hydro-Electric Commission of Waterloo, Wellesley & Woolwich were transferred to Waterloo North Hydro Inc. on incorporation March 1, 2000.

In 2017, boundary amendments with Hydro One and Energy+ occurred due to the settlement of Long Term Load Transfers (LTLT). A current WNH boundary map is provided in **Figure 1-2.** As a result, WNH had a net increase in its service area of 11 sq. km, increasing it to 683 sq. km. In addition to the City of Waterloo, the Township of Woolwich and the Township of Wellesley, WNH now provides regulated electricity distribution services to approximately 127 customers in the Township of Perth East, the Township of Mapleton, the Township of Centre Wellington, the Township of Guelph/Eramosa, and the City of Cambridge. A breakdown of WNH's customers and service area can be found in **Table 1-1**.

Table 1-1: WNH Customer & Service Area Demographics

MUNICIPALITY	CUSTOMERS	%	SERVICE AREA (sq. km)	%	CUSTOMER DENSITY (per sq. km)
City of Waterloo	44,507	76.9%	65	9.5%	685
Township of Woolwich	9,806	16.9%	328	48.2%	30
Township of Wellesley	3,484	6.0%	269	39.4%	13
Wellington County	67	0.1%	13	1.9%	5
Perth County	10	0.0%	7	1.0%	1
Cambridge	1	0.0%	0	0.0%	7
Total	57,875	100%	683	100%	85

Figure 1-2: WNH Service Territory



WNH has a large service area, much of it rural in nature with a low customer density. The urban and rural breakdown of WNH's service area and customers are illustrated in **Table 1-2**, and **Table 1-3** respectively.

Table 1-2: Service Area - Rural / Urban Breakdown

MUNICIPALITY	URBAN (sq.km.)	%	RURAL (sq.km.)	%	TOTAL (sq.km.)
City of Waterloo	65	10%			65
Township of Woolwich			328	48%	328
Township of Wellesley			271	40%	271
Wellington County			13	2%	13
Perth County			5	1%	5
Cambridge			0	0%	0
Total	65	9.5%	618	90.5%	683

Table 1-3: Customers - Rural / Urban Breakdown

MUNICIPALITY	URBAN	%	RURAL	%	TOTAL
City of Waterloo	44,507	76.9%			44,507
Township of Woolwich			9,806	16.9%	9,806
Township of Wellesley			3,484	6.0%	3,484
Wellington County			67	0.1%	67
Perth County			10	0.0%	10
Cambridge			1	0.0%	1.0
Total	44,507	76.9%	13,368	23.1%	57,875

WNH has a significantly higher percentage of rural service area than other nearby LDC's with 90.5% of WNH's total service area accounting for only 23.1% of its customer base. The data presented in **Section 3.2** Overview of Assets Managed, will illustrate the relatively disproportionate number of assets required to service WNH's rural areas vs urban areas. This has a major influence on increasing WNH's cost structure.

In spite of recent service area boundary amendments, 97% of WNH's Service Area and 99.9% of WNH's customer base remains within the City of Waterloo, Township of Woolwich and Township of Wellesley. Current population and population densities are illustrated in **Tables 1-4**.

Table 1-4: WNH Service Area Population Density

MUNICIPALITY	POPULATION	%	SERVICE AREA (sq.km)	%	POPULATION DENSITY (per sq. km)
City of Waterloo	137,420	79.1%	65.0	1.6%	2,114
Township of Woolwich	25,006	14.4%	329.0	8.1%	76
Township of Wellesley	11,260	6.5%	278.0	6.8%	41
Total	173,686	100.0%	672	16.5%	258

Since 2011, WNH's customer growth rate has experienced a steady decline from 1.4% to 0.7% annually. A decreasing inventory of developable greenfield land, and the increasing penetration of bulk metered high rise condominium style housing within WNH's service area, has resulted in the decrease in customer growth rate. WNH does not foresee any additional major economic and development growth drivers occurring over the forecast years and has forecasted an overall customer growth rate of 0.72% over the 2021 – 2025 period. **Table 1-5** illustrates WNH's historical and forecast year end customer totals and growth in customer base by rate class.

Table 1-5: Historical and Forecast Customer Growth

Projected Growth	Historical					Forecast				
Customer Class	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Residential	49,767	50,463	50,865	51,216	51,550	51,886	52,223	52,563	52,904	53,248
GS <50	5,730	5,834	5,841	5,892	5,956	6,022	6,088	6,154	6,221	6,289
GS =>50	730	740	761	743	765	784	804	824	844	865
Large User	1	1	1	1	1	1	1	1	1	1
Direct Market Participant	2	2	3	3	3	3	3	3	3	3
Street Light	6	6	5	5	5	5	5	5	5	5
Embedded Distributor	1	1	1	1	1	1	1	1	1	1
Unmetered Scattered Load	14	14	14	14	14	14	14	14	14	14
Total	56,251	57,061	57,491	57,875	58,295	58,716	59,138	59,564	59,994	60,427
% Increase	1.38%	1.44%	0.75%	0.67%	0.73%	0.72%	0.72%	0.72%	0.72%	0.72%

Individually over the forecast period, the average growth rate for residential class is 0.65%, and the GS<50 kW and GS>=50 kW classes have an average growth rate of 1.09% and 2.50%, respectively. All other classes have a growth rate of zero percent.

1.3.4. Weather

WNH experiences weather typical of South Western Ontario; however, the last several years have been marked with an increase in the frequency of severe weather events. WNH's large rural area provides a greater exposure to damage by severe wind and ice events than urban utilities. A discussion on the impacts of weather related events on WNH's reliability can be found in **Appendix K** - WNH Distribution System Reliability Report.

1.3.5. Demand & Energy

WNH has been a summer peaking utility since 1996 and weather still remains the main factor impacting volatility in WNH's peak demand. Although the Region of Waterloo has been and continues to be a growing community, the growth in annual peak demand (MW) has moderated over the past decade. From 1992 to 2011, WNH's annualized growth rate in Summer System Peak Demand stood at 2.2%. Since 2015 WNH's annualized growth rate has declined to 1.0%.

Similarly, but to a greater extent, WNH's annualized growth rate in Winter System Peak Demand has declined from 1.1% to approximately 0.2%.

The main contributing factors leading to the decline in demand are believed to be a decline in customer growth rate, load shifting due to time-of-use rates, contributions from embedded generation, Conservation & Demand Management programs (CDM) and other conservation measures. WNH believes that the current factors influencing demand will continue with embedded generation having an even greater impact over the forecast period. For the period 2020 – 2025, WNH is forecasting an annualized growth rate of 1.0% in summer demand and 0.2% in winter demand. WNH's historical and forecast peak demand is illustrated in **Figure 1-3**.

Figure 1-3: WNH Peak Demand

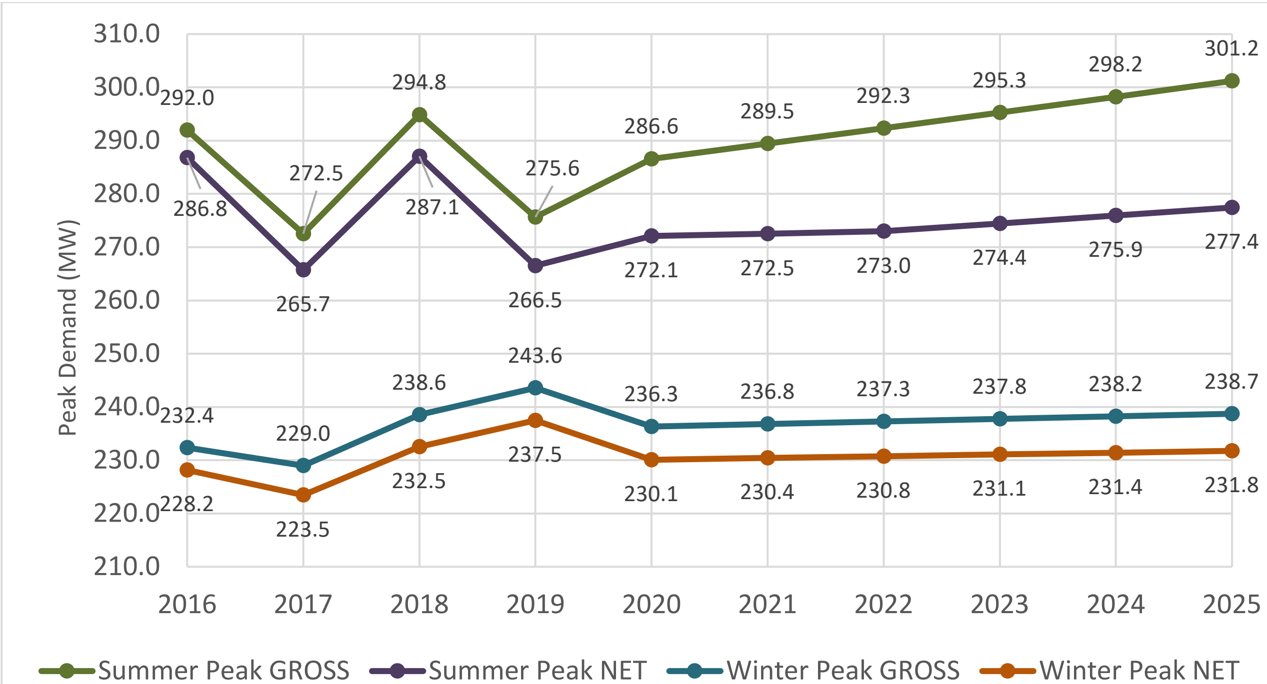


Figure 1-4 illustrates the similarity in trends of energy delivered and system demand from 2002 to 2019. Growth in energy delivered can be seen flattening in 2011 and has remained flat since. Factors negatively impacting the growth in energy delivered are similar to those impacting demand. WNH is forecasting a continuation of this trend with a growth rate of 0.8% in kWh over the forecast period. **Figure 1-5** illustrates MWh historical and forecast consumption by rate class.

Figure 1-4: WNH Historical Energy & Demand

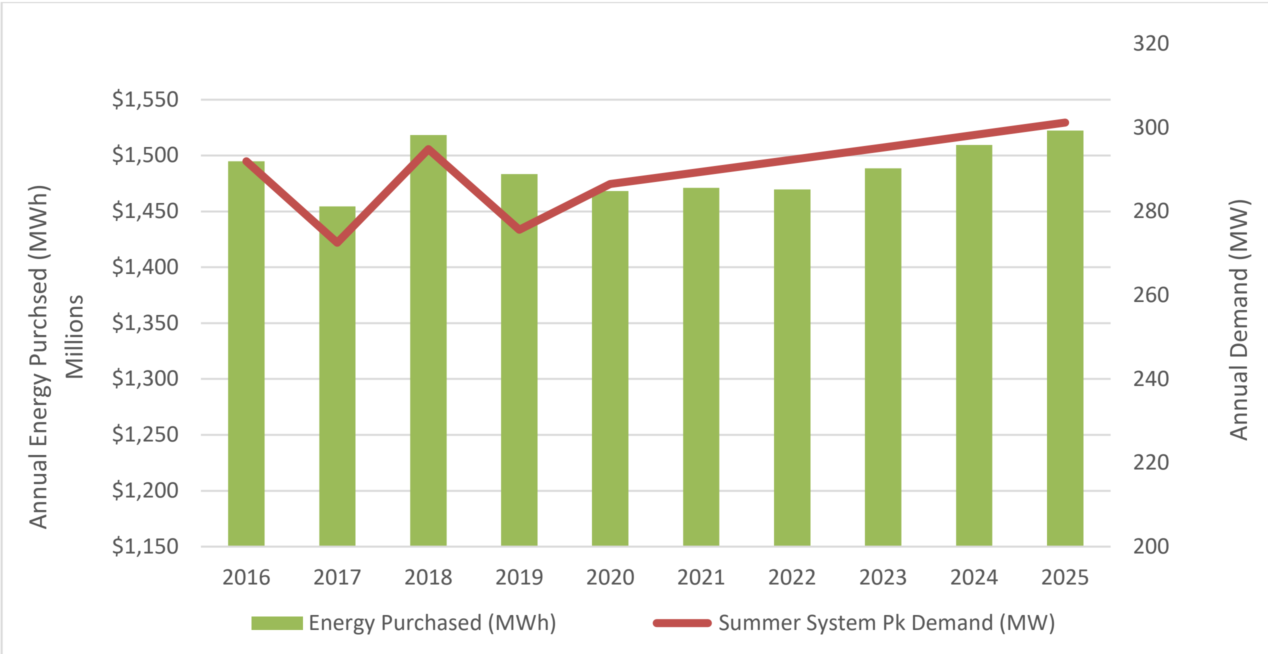
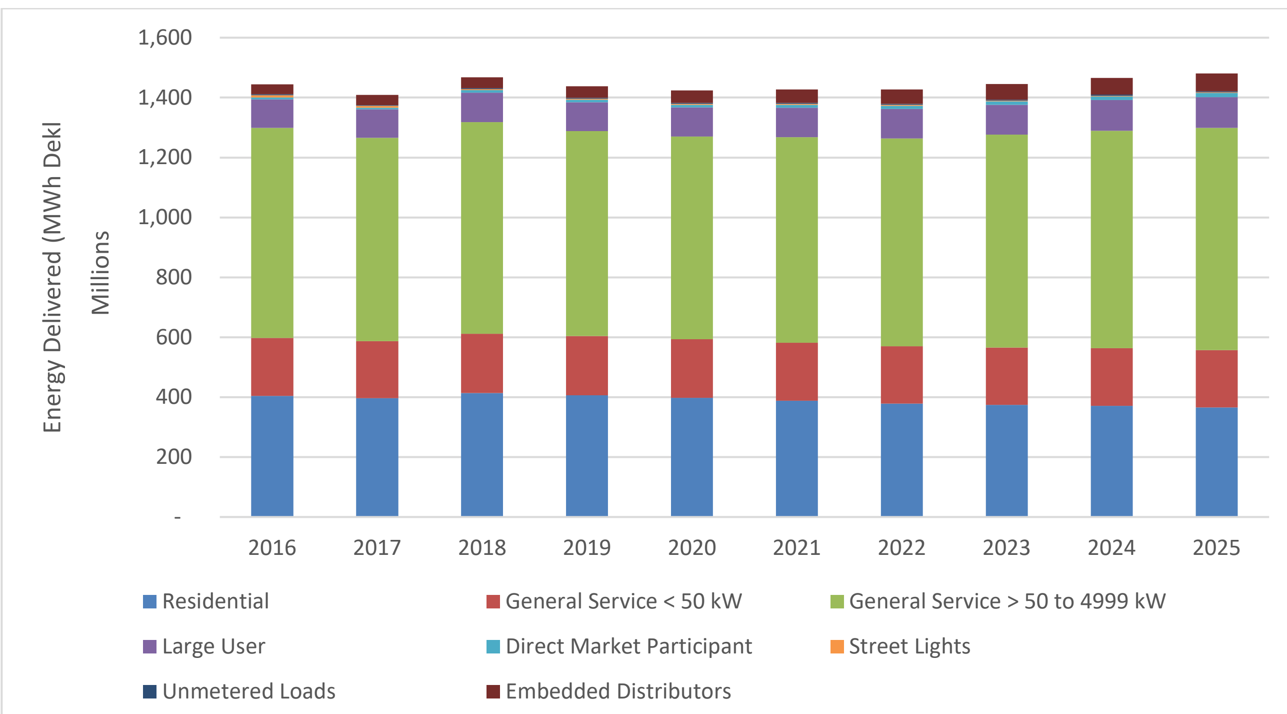


Figure 1-5: Historical & Forecast Delivered Energy



1.3.6. System Losses

WNH reviews its distribution system losses regularly and under the OEB's Reporting and Record Keeping Requirements (RRR), reports its actual distribution losses annually. The results can be found in the annual OEB Yearbook of Ontario Electricity Distributors (Yearbook).

A summary of loss factors calculated from the "Consolidated Key Metrics of the Ontario Electricity Distributors Sector" found in the various Yearbooks as well as WNH's reported loss factors are provided in **Table 1-6**.

Table 1-6: Annual System Losses

Year	Provincial System Losses	WNH System Losses	% Diff
2016	3.6%	3.6%	0.0%
2017	3.9%	3.3%	-0.6%
2018	4.0%	3.6%	-0.4%
2019	Not Available	3.2%	

WNH's loss factor has been ranging between 3.2% – 3.6%, well below the OEB's recommended threshold of 5% as set out in the OEB's document "Ontario Electricity Distributor Practices Relating to Management of System Losses (June 23, 2008)". WNH's loss factor is also consistently at or below the Ontario provincial average.

While WNH may not undertake capital projects solely for the purpose of loss reduction, it is a beneficial by-product of planned capital investments driven by other priorities. Activities that WNH regularly undertakes that continue to mitigate line losses include the following.

- System Renewal investments that include;
  - converting to higher voltages (4 kV or 8 kV to 27.6 kV);
  - using larger conductors;
  - eliminating older distribution stations that have high transformer losses;

- installing capacitor banks to improve end of line feeder voltage;
- performing system optimization studies;
- balancing feeder and phase loading;
- updating purchasing criteria for distribution transformers;
- diligent adherence to Measurement Canada's Meter Accuracy Verification program;
- regular inspection and cross phase testing of polyphase transformer type meter installations;
- visual inspections of meters for broken seals, tampered meters and jumper wires;
- performing random checks of billing multipliers;
- investigating exception reports that highlight zero usage readings, meters that show consumption with no billing account, and other material variances in consumption;
- conducting audits on customer bills by comparing the previous year's and the previous month's consumption to the current billings;
- working with local law enforcement to assist with theft of power issues.

Over the forecast period WNH's performance target for system losses remains aligned with the OEB's threshold of remaining below 5%. Given the activities that have led to WNH's current historical performance are expected to carry on over the forecast period, no investments to specifically reduce line losses are included in this DSP.

1.3.7. Risk - Distribution Revenue and Stranded Assets

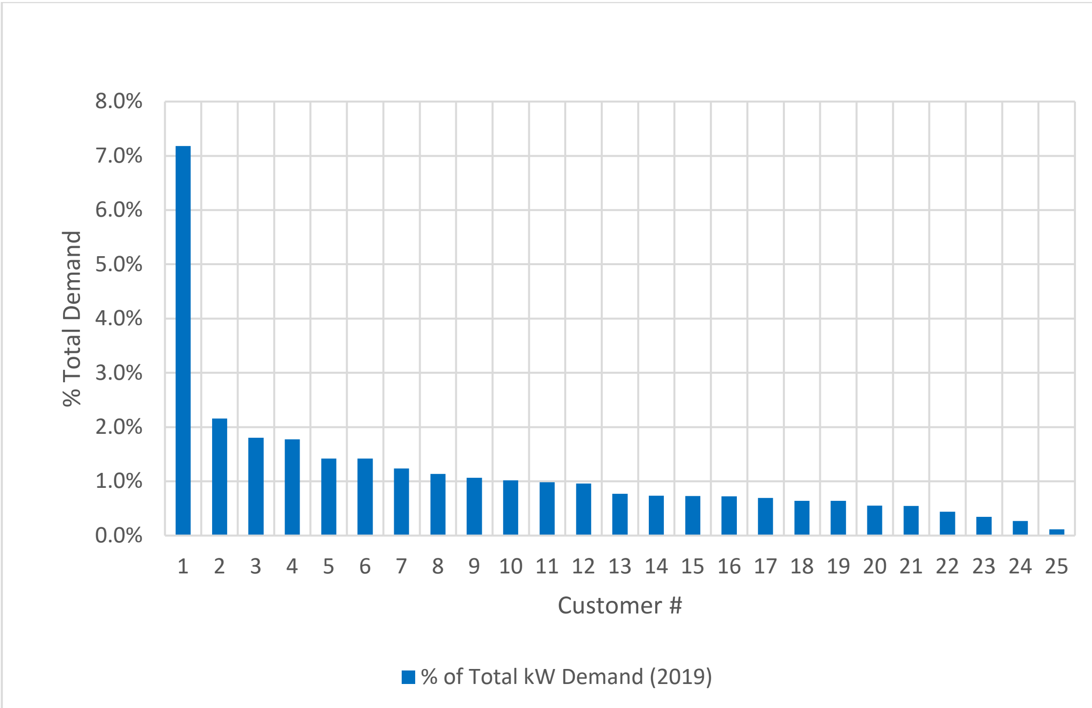
WNH believes that a thorough understanding of its customer base is needed in order to make good investment decisions and mange risk. WNH surveys the landscape of the local economy to look for positive and negative trends that may impact on its business. Although WNH has experienced a decline in customer kW demand and kWh consumption growth over the past decade, it remains positive that the underlying drivers of the local economy still remain strong.

WNH's customer base is diverse and dominated by residential, small and medium sized business customers. WNH believes that diversity is a strength in that no single customer poses a significant risk to the loss of distribution revenue or the stranding of significant assets. **Figure 1-6** illustrates the relative contribution to overall system demand for WNH's top 25 customers.

WNH's five largest customers by distribution revenue are Government and Public Institutions that make up 7.8% of total distribution revenue. WNH's remaining business customers contribute less than 1% each. WNH is home to three very successful and growing educational institutions that have and continue to spinoff numerous start-up high tech companies. The educational institutions also attract numerous high tech companies looking for talent. Although high tech companies are not large users of electricity, they stimulate the local economy which strengthens the remainder of WNH's customer base.

Along with the stability that small and medium size customers bring, comes the fact that smaller customers are generally costlier to serve on a per MW basis. There are economies of scale that exist in servicing large customers that can not be replicated for the small customers. WNH makes every effort to understand the benefits and challenges of its unique service area and integrate this information into its planning and investment decisions.

Figure 1-6: Customer Percentage Contribution to WNH System Peak Demand



1.3.8. The Distribution System

WNH is connected to the Hydro One Networks Inc. (HONI) Transmission System (HONI Tx) through five grid connected Dual Element Spot Network (DESN) Transformer Stations as illustrated in **Table 1-7**. Four (4) of these are owned and operated by WNH. One (1), Elmira Transformer Station (ELTS), is owned and operated by HONI and is embedded inside of WNH's service territory. WNH owns 2 feeders and portions of the third feeder emanating from the ELTS. Approximately 80% of the ELTS load is supplied to WNH customers with the remaining load supplied to HONI customers in nearby Wellington County.

Table 1-7: WNH Transmission Points of Supply

#	Transformer Stations	Owned & Operated by	Supplied By	HONI TX Line	HV (kV)	Station Location	LV (kV)	Tx ID	Tx ONAF Rating (MVA)	10 day LTR (MVA)
1	HMSTS 'A'	WNH	HONI Tx	D6V	230	Waterloo	13.8	T1	50	69
				D7V	230			T2	50	
2	HMSTS 'B'	WNH	HONI Tx	D7V	230	Waterloo	13.8	T3	83	110
				D6V	230			T4	83	
3	MTS #3	WNH	HONI Tx	D6V	230	Waterloo	27.6	T1	67	85
				D7V	230			T2	67	
4	ERTS (Note1)	WNH	HONI Tx	D10H	115	Waterloo	13.8	T1	50	75
				D8S	115			T2	50	
5	ELTS	HONI	HONI Tx	D10H	115	Woolwich	27.6	T1	42	62
								T2	42	

(Note1) – ERTS is currently limited by the thermal rating of the station transformers' secondary cables to a summer LTR of 69 MVA. The LTR of the power transformers is 75 MVA.

WNH also receives electrical supply at three < 50 kV (Dx) points of supply listed in **Table 1-8** from 3 neighbouring LDCs; Hydro One Distribution (HONI Dx), Kitchener-Wilmot Hydro (KWHI) and Energy+. From the transmission connected transformer stations, WNH distributes electricity to its customers over 47 feeders at distribution voltages of 27.6 kV, 13.8 kV.

Table 1-8: WNH Points of Supply < 50 kV

	Feeder ID	Supplied From	Supply Point Location	LV (kV)	Load Capacity at WNH Boundary (MVA)	Generation Capacity at WNH Boundary (MVA)
1	73M7	HONI Dx	Woolwich	44.0	8.0	4.8
2	9M4	KWH Dx	Wellesley	27.6	6.0	3.6
3	21M25	Energy+ Dx	Woolwich	27.6	14.3	8.6

In addition to the Transformer Stations noted in **Table 1-7**, it can be seen in **Table 1-9** that WNH's distribution network includes 6 rural Distribution Stations operating at < 50 kV. **Figure 1-7** illustrates the locations of these stations in WNH's service area. WNH also distributes electricity to its customers over 17 feeders at a distribution voltage of 8.32 kV from these distribution transformer stations.

Table 1-9: WNH Municipal and Distribution Stations in Service

	DS	Owned & Operated by	Supplied By	Location	HV (kV)	LV (kV)	Tx ID	Transformer Rating (MVA)
1	DS#26	WNH	WNH	Wellesley	27.6	8.32	T1	5.6
2	DS#27	WNH	WNH	Wallenstein	27.6	8.32	T1	3.6
3	DS#28	WNH	WNH	Floradale	27.6	8.32	T1	5.0
4	DS#29	WNH	WNH	St Jacobs	27.6	8.32	T1&T2	3.6
5	DS#30	WNH	WNH	Zubers Corners	44.0	8.32	T1	5.0
6	DS#31	WNH	WNH	Bloomingdale	27.6	8.32	T1	5.0

Since 2016, WNH has removed 6 municipal and rural distribution stations from service as a result of investments in System Renewal and the resulting conversion to higher voltages. These stations which are identified in **Figure 1-7**, are currently in various stages of decommissioning and environmental remediation.

In addition to the aforementioned transformer station assets, an overview of WNH's Distribution Assets is provided in **Table 1-10**. More detailed information regarding WNH's Distribution Assets are provided in **Section 3.2**.

Figure 1-7: WNH Stations out of Service (2016 – 2019)

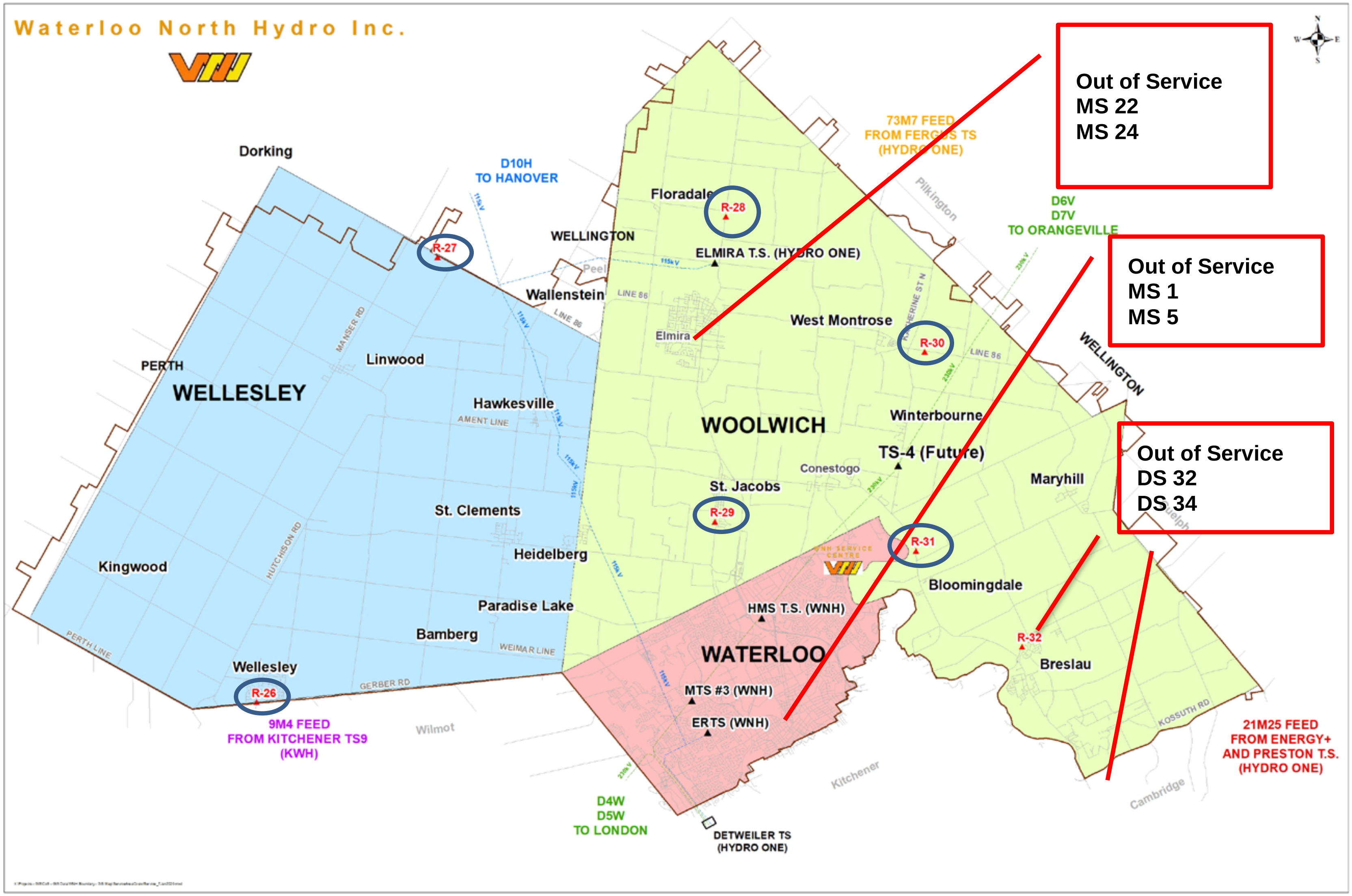


Table 1-10: WNH Distribution Asset Summary

Asset Group	Single Phase	Three Phase	Total
OVERHEAD ASSETS			
Primary Circuits (km)	368	704	1,072
Poles			21,807
Distribution Transformers	3,212	793	4,005
Electronic Reclosers / Switches	5	83	88
Manual Load Break Switches	0	353	353
Non-Load Break Switches	2,228	892	3,120
Capacitor Banks	2	39	41
UNDERGROUND ASSETS			0
Underground Primary Circuits (km)	511	64	576
UG Distribution Transformers	3,571	253	3,824
Electronic Reclosers / Switches		2	2
Manual Load Break Switches / Switch vaults	0	219	219
Non-Load Break Switches	35	112	147
METERING			
Retail Revenue Meters	51,807	6,711	58,518
Wholesale Revenue Meters	0	43	43

1.3.9. Embedded Generation

As of December 31, 2019, WNH had connected 655 generators to its distribution system for a total of 19,968 kW. Of these, 652 were Renewable Energy Generator (REG) connections totalling 15,448 kW. From 2015 to 2019, WNH connected 287 generators for a total of 11,492 kW. Of these, 284 for a total of 6,972 kW were REGs. **Table 1-11** provides a breakdown of the connections by generation type.

Table 1-11: WNH Generator Connections by Type

Generation Type	MicroFIT		FIT		Net Metered		Load Displacement		Total Connected	
	Num	(kW)	Num	(kW)	Num	(kW)	Num	(kW)	Num	(kW)
Solar	568	4,740	38	6,273	39	905	1	412	646	12,330
CHP							1	50	1	50
Wind			2	100	2	43			4	143
Biomass			1	2,850					1	2,850
Battery							2	4,470	2	4,470
Organic Rankine Cycle							1	125	1	125
Total	568	4,740	41	9,223	41	948	5	5,057	655	19,968
% of Total	86%	24%	6%	46%	6%	6%	1%	25%	100%	100%
REG	568	4,740	41	9,223	41	948	2	537	652	15,448
% REG	87%	31%	6%	60%	6%	6%	0.3%	3%	100%	100%

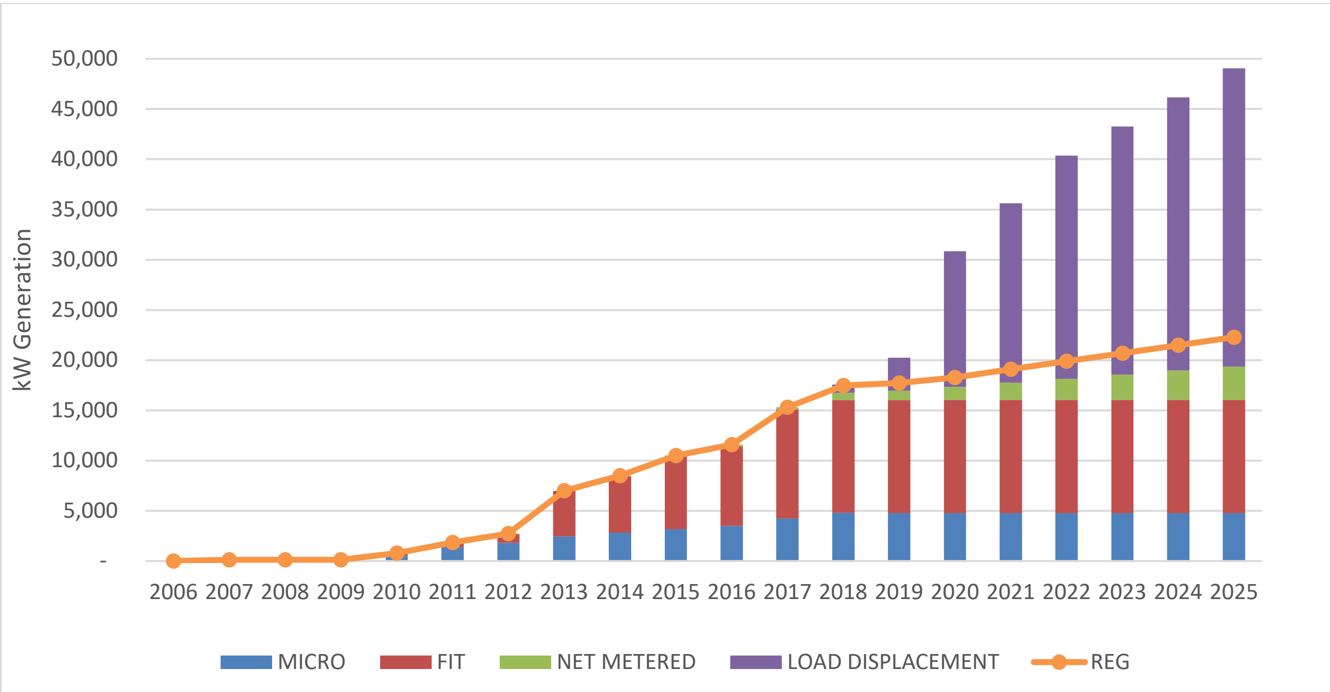
The Independent Electricity System Operator (IESO) ceased to accept applications under the microFIT and FIT Programs as of December 31, 2016. The last connections under these programs were made in 2018. WNH has no microFIT or FIT applications allocated or pending. Total REGs connected under these programs totals 568 micoFIT (4,740 kW) and 41 FIT (9,223 kW).

The amount of Net Metering generation connected to date has been relatively small and is not forecast to be a major factor over the forecast period. Currently, WNH has only 3 projects pending for a total of 363 kW.

Incented by high Global Adjustment charges and electricity commodity pricing, Load Displacement Generation (LDG) has been the fastest growing segment of connected generation over the last 2 years. Currently WNH has 7 LDG projects allocated for a total of 10,348 kW and one LDG project pending for a total of 1,890 kW. **Table 1-12** provides a summary of the amount of connected and forecast generation.

Figure 1-8 illustrates the growth of REG and NON REG in WNH's service area from 2006 - 2019 and WNH's forecast for each from 2020 – 2025.

Figure 1-8: Historical and Forecast Growth in Generation



Of WNH's 659 embedded generators, the 20 largest are listed in **Table 1-13**. This group makes up 60% of the total connected kW. The average generator size is 31 kW.

At the time of WNH's 2019 summer system peak, total generation contributed an estimated 9,120 kW of which REG contributed 7,865 kW and LDG contributed 1,528 kW. Overall, generation was operating at approximately 45% of capacity.

Table 1-12: WNH Total Generator Connections by Year

Year	MicroFIT		FIT		Net Metered		Load Displacement		Total		Accumulated Total (kw)
	Num	(kW)	Num	(kW)	Num	(kW)	Num	(kW)	Num	(kW)	Pre 2015 8,476 kW
2015	38	347	11	1,647	3	33	0	0	52	2,027	10,503
2016	35	335	3	650	4	90	0	0	42	1,075	11,577
2017	83	725	5	960	6	47	1	2,000	95	3,732	15,309
2018	70	511	2	370	8	511	3	587	83	1,979	17,288
2019					14	210	1	2,470	15	2,680	19,968
2020			1	35	2	230	7	10,348	10	10,613	30,581
2021					9	400	5	4,353	14	4,753	35,334
2022					9	400	4	4,330	13	4,730	40,064
2023					9	400	5	3,500	14	3,900	43,964
2024					9	400	5	3,500	14	3,900	47,864
2025					9	400	5	3,500	14	3,900	51,764
Total 2015 - 2019	226	1,917	21	3,627	35	891	5	5,057	287	11,492	
Total 2020 - 2025	0	0	1	35	47	2,230	31	29,531	79	31,796	

Table 1-13 WNH 20 Largest Generators

Rank	Fuel Type	Year Installed	Generator Size (kW)	Category
1	Biomass	2013	2,850	FIT
2	Battery	2019	2,470	LOAD DISPLACEMENT
3	Battery	2017	2,000	LOAD DISPLACEMENT
4	Solar	2014	500	FIT
5	Solar	2017	450	FIT
6	Solar	2018	412	LOAD DISPLACEMENT
7	Solar	2018	399	NET METERED
8	Solar	2016	300	FIT
9	Solar	2012	250	FIT
10	Solar	2013	250	FIT
11	Solar	2013	250	FIT
12	Solar	2014	250	FIT
13	Solar	2015	250	FIT
14	Solar	2016	250	FIT
15	Solar	2017	250	FIT
16	Solar	2013	225	FIT
17	Solar	2018	219	FIT
18	Solar	2010	200	FIT
19	Solar	2014	200	FIT
20	Solar	2015	200	FIT

Overall there is a significant amount of generation capacity available at WNH’s transformer stations and feeders. Based on WNH’s evaluation of current connections and forecast applications, WNH believes that there is adequate capacity to connect the anticipated generation over the forecast period.

Please refer to WNH’s Renewable Energy Generation Investments (REGI) Plan **(Appendix H)** for a more indepth analysis regarding the readiness of WNH’s distribution system to connect REG.

1.4. Background and Drivers

1.4.1. Overview

This DSP was informed by consultations with municipal planning and economic development staff, developers, builders and real estate brokers along with WNH's historical knowledge of private and public development within its service territory. The plan was also informed by WNH's Asset Condition Assessment program (ACA), Asset Management plan (AMP) and distribution system performance metrics. Further information in these activities can be found in later sections of this DSP.

All WNH capital investments are grouped into the four OEB categories as prescribed in Chapter 5.

1. System Access - WNH's second largest area of investment is in System Access projects. Expansions for new customer connections and municipal relocations are investments that form part of WNH's statutory obligation to serve. Included are also service connection upgrades and retail metering investments. These investments support WNH's strategic imperatives for supply and customer service.

2. System Renewal - The largest portion of the proposed investment plan that centres on the replacement of end-of-life assets. These investments are made to maintain the safety and performance of the distribution system and are aligned with WNH's strategic imperatives of supply & reliability, safety and environment. A renewed distribution system is better able to withstand poor weather conditions and also supports the connection of Renewable Energy Generation, electric vehicles and smart grid devices.

3. System Service - These investments are targeted to ensure the distribution system continues to meet its operational and performance objectives. Investments involving security, protection & control, smart grid enhancements and feeder interconnectivity support WNH's strategic imperatives of reliability, safety and organizational effectiveness.

4. General Plant - These investments are focused on providing tools, equipment and systems that support operating efficiency, customer service and worker productivity. Replacement of vehicles, IT software and hardware, tools & equipment make up the bulk of the investments and support WNH's strategic imperatives of productivity and cost reduction, organizational effectiveness and customer service.

Table 1-14 provides a listing of common drivers used by WNH to classify capital expenditures. For reporting purposes, a project or program is categorized by a trigger driver, however all drivers were considered in the analysis of capital investment options.

Table 1-14: WNH Category Drivers for Material Projects

OEB Category	Driver	Projects/Programs
System Access	Customer Service Requests	Expansions (Subdivisions)
		Customer Connections
		Expansions (Lines)
		Modifications to existing connections
	Third Party Infrastructure	Relocations due to Roadway Modifications
	Mandated Service Obligations	Revenue Meters, Long Term Load Transfers
System Renewal	Assets at End-of-Life Substandard Performance Functional Obsolescence	Overhead Renewal (Planned)
		Underground Renewal (Planned)
		Proactive Renewal
		Reactive Renewal
		Station Equipment Renewal
		SCADA Equipment Renewal
System Service	System Operational Objectives	Grid Resiliency
		Grid Modernization
		Wholesale Metering
		Transformer Station Upgrades
	System Constraints	Contingency Enhancement
General Plant	System Maintenance Support	Tools & Equipment
		Fleet - Trucks
		Building & Furniture Improvements
	Business Operations Efficiency	Information Systems Hardware & Software
	Non-system Physical	Land & Buildings

1.4.2. Historical and Forecast

WNH's overall capital investment plan has been historically driven by System Renewal investments followed by System Access. An overview of historical capital expenditures is provided in **Table 1-15** and **Figure 1-9**. With the exception of 2016, gross capital expenditures between 2017 and 2019 averaged between $18.3 million and $19.9 million annually. The exceedance in capital expenditures in 2016 was as a result of an increase in the scope of work required by the Waterloo Region Light Rail Transit (LRT) project.

Table 1-15: Summary of 2016 - 2020 Capital Investments by OEB Category

OEB Investment Category	Test Year	Historical Period				Average Annual Investment	% Average Annual Investment
	2016	2017	2018	2019	2020	2016-2020	2016-2020
System Access	$ 17,628,164	$ 6,298,503	$ 6,091,460	$ 6,243,182	$ 5,839,159	$ 8,420,094	39%
System Renewal	$ 7,801,178	$ 9,481,900	$ 8,423,589	$ 9,438,714	$ 8,612,076	$ 8,751,491	41%
System Service	$ 1,742,066	$ 566,843	$ 1,822,412	$ 2,449,054	$ 2,198,991	$ 1,755,873	8%
General Plant	$ 2,288,204	$ 2,264,671	$ 2,030,139	$ 1,810,228	$ 3,554,579	$ 2,389,564	11%
Gross CAPEX	$ 29,459,613	$ 18,611,917	$ 18,367,600	$ 19,941,178	$ 20,204,805	$ 21,317,023	100%
Contributed Capital	$ 12,636,204	$ 4,578,501	$ 2,968,930	$ 2,110,939	$ 2,065,806	$ 4,872,076	23%
Net CAPEX	$ 16,823,409	$ 14,033,416	$ 15,398,670	$ 17,830,239	$ 18,138,999	$ 16,444,947	

A summary of WNH's proposed capital investments for the forecast period 2021 - 2025 is provided in **Table 1-16** and **Figure 1-9**. Forecast gross capital expenditures are expected to range from $19.0 million to $20.7 million annually. The proposed levels of capital investment, for each category and in total, are relatively consistent over the forecast period. This forecast is reflective of the WNH's belief that the investment drivers will remain characteristically similar from 2021 through to 2025.

Table 1-16: Summary of 2021 - 2025 Capital Investments by OEB Category

OEB Investment Category	Test Year	Forecast Period				Average Annual Investment	% Average Annual Investment
	2021	2022	2023	2024	2025	2021-2025	2021-2025
System Access	$ 5,840,262	$ 6,166,099	$ 6,305,421	$ 6,447,529	$ 6,592,480	$ 6,270,358	31%
System Renewal	$ 8,095,769	$ 9,371,995	$ 9,548,434	$ 9,693,203	$ 9,951,367	$ 9,332,154	47%
System Service	$ 2,293,605	$ 1,346,209	$ 1,288,333	$ 1,211,460	$ 1,211,589	$ 1,470,239	7%
General Plant	$ 2,818,876	$ 3,567,432	$ 3,593,891	$ 2,062,637	$ 2,221,975	$ 2,852,962	14%
Gross CAPEX	$ 19,048,512	$ 20,451,734	$ 20,736,079	$ 19,414,828	$ 19,977,411	$ 19,925,713	100%
Contributed Capital	$ 2,642,394	$ 2,709,839	$ 2,764,036	$ 2,819,317	$ 2,875,703	$ 2,762,258	14%
Net CAPEX	$16,406,118	$ 17,741,894	$ 17,972,043	$ 16,595,512	$ 17,101,708	$ 17,163,455	

Figure 1-9: Historical and Forecast Capital Expenditures ($)

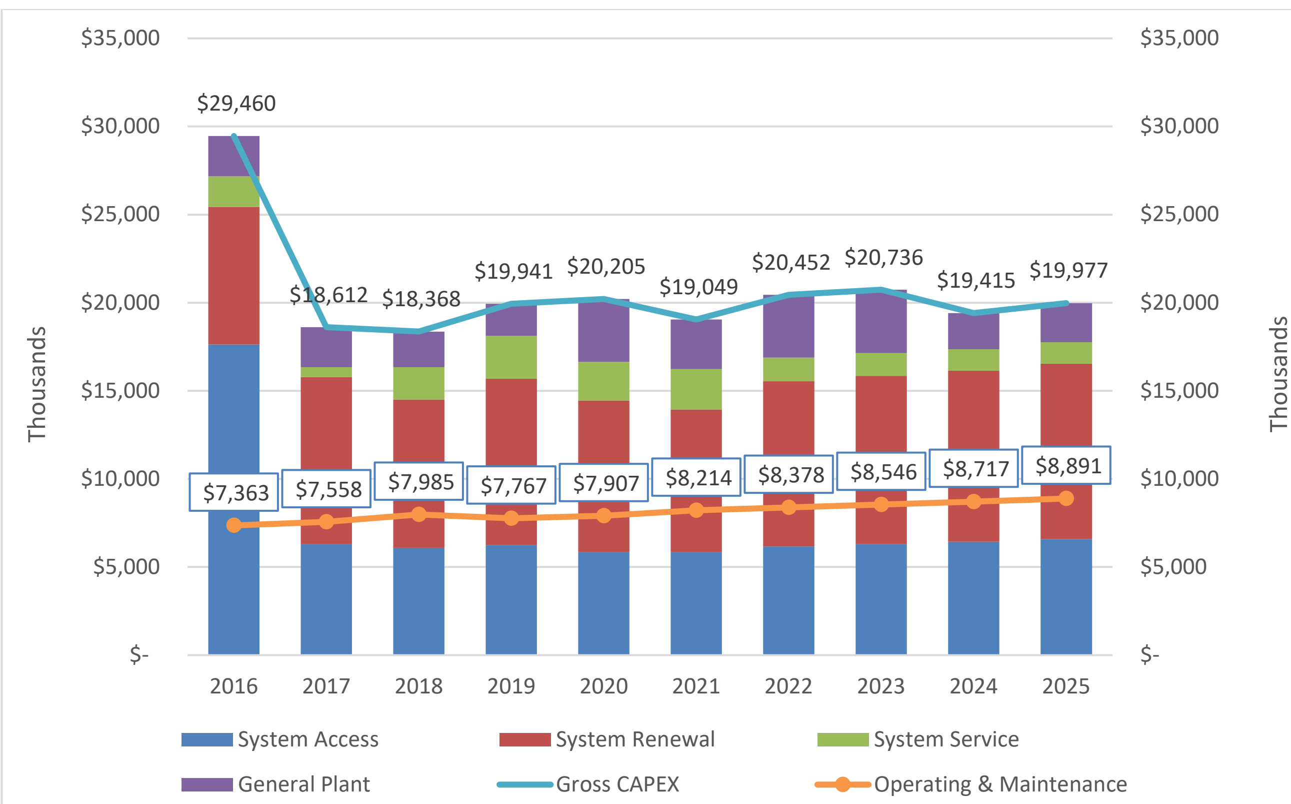
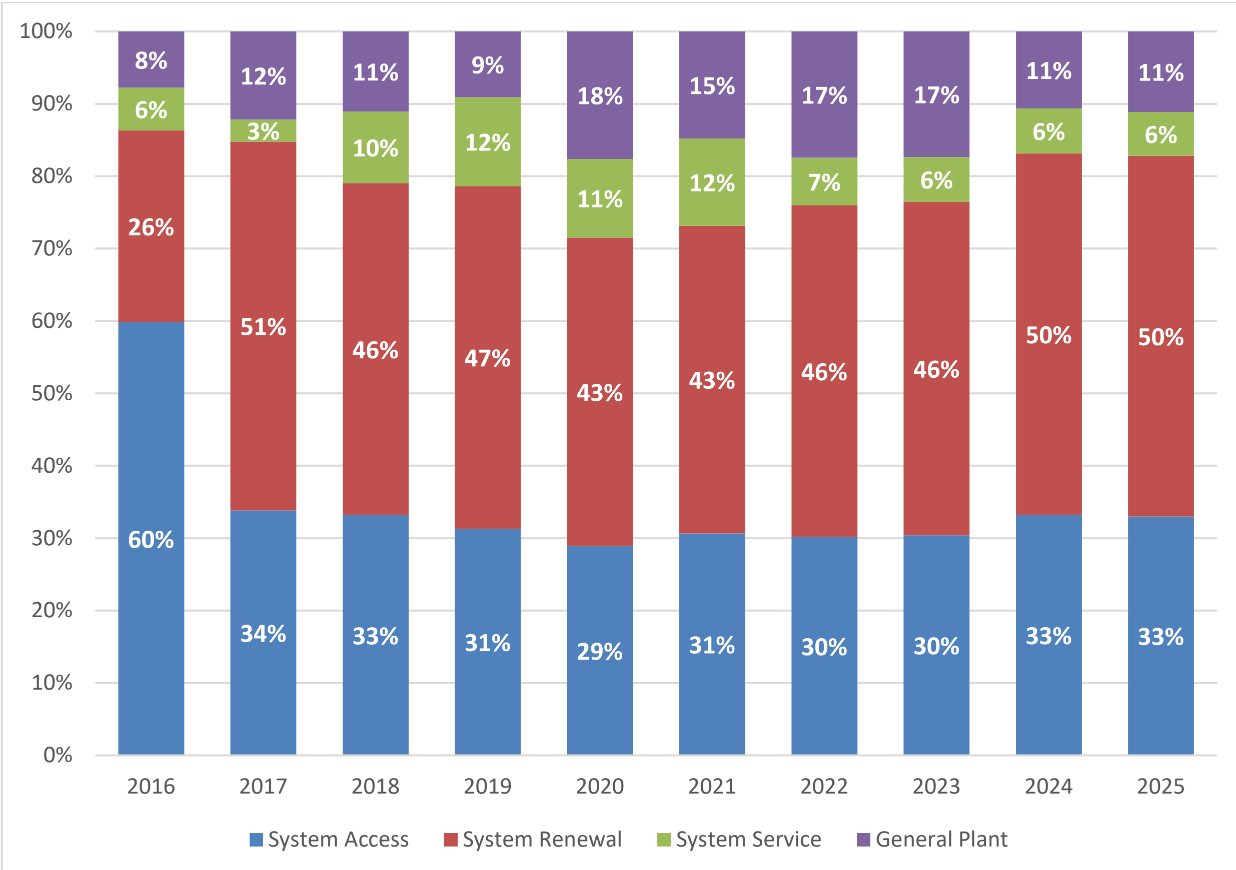


Figure 1-10: Historical and Forecast Capital Expenditures (%)



1.4.3. Test Year (2021)

This section provides a summary of WNH's 2021 capital expenditures and primary material programs. A high level breakdown, by OEB category, is provided in **Table 1-17**. Referring back to **Figure 1-9**, it can be seen that the 2021 forecast is not out of line with historical and forecast expenditures. Each investment decision has been supported by one or more identifiable drivers and corporate strategic imperatives. More detailed information on these specific material projects can be found in **Section 4.2.2** and **Appendix B** - 2021 Material Capital Investments.

Table 1-17: Summary of 2021 Material Investments

OEB Investment Category	# Projects / Programs	Total $	% Total CAPEX	# Material Projects (> $ 190,000)	Total $	% Total CAPEX	% Total OEB Category
System Access	7	$ 5,840,262	31%	6	$ 5,729,032	30%	98%
System Renewal	8	$ 8,095,769	43%	6	$ 7,212,102	38%	89%
System Service	5	$ 2,293,605	12%	4	$ 1,807,067	9%	79%
General Plant	8	$ 2,818,876	15%	5	$ 2,058,117	11%	73%
Total	28	$ 19,048,512	100%	21	$ 16,806,318	88%	

1.4.3.1. System Access

Table 1-18: 2021 System Access Investment Summary

System Access	# Projects / Programs	Total $	% of 2021 System Access	% of Total 2021 CAPEX
Total	7	$ 5,840,262	100%	30.7%
Materiality > $190,000	6	$ 5,729,032	98%	30.1%
Material Projects/ Programs				
Customer Connections	1	$ 2,168,379	37%	11.4%
Expansions	2	$ 1,552,341	27%	8.1%
Relocations	2	$ 1,343,713	23%	7.1%
Metering	1	$ 664,599	11%	3.5%
Total	6	$ 5,729,032	99%	30.1%

Table 1-18 provides an overview of WNH's System Access investments and the material programs for 2021. System Access investments are prescribed by regulation or code, making them normally the highest priority investments in the plan. They are also highly dependent on customer plans making the magnitude and timing of investments less predictable. The programs noted in this plan are typical and support WNH's strategic imperatives of Supply and Customer Service.

Customer Connections

WNH's customer growth rate has experienced a decline from 1.4% to 0.7% over the historical period. Investment requirements for new connections have also declined on average since 2016. New connections and modifications to existing customer connections in 2021 are reflective of this new level of activity and are expected to remain at this level over the forecast period.

Expansions

WNH is forecasting the connection of 286 new subdivision lots for 2021. Line expansion investments are based on information obtained through municipal and customer consultations. WNH sees no major drivers over the forecast period to substantially alter this level of activity.

Relocations

WNH's 2021 relocation investment plans have been based on consultations with local municipal road authorities along with the Ministry of Transportation Ontario (MTO). They all have ongoing road rehabilitation and widening projects; however, often the extent of relocation efforts is not fully known until the design stage of a project. The two relocation programs are comprised of approximately 7 individual road widening projects. This level of activity is expected throughout the forecast period.

Metering

WNH's metering program allows for the connection of customers of all classes and the renewal of metering assets at end of life. Expenditures proposed in 2021 are within the range experienced over the historical period and reflective of the expected activity.

1.4.3.2. System Renewal

Table 1-19: 2021 System Renewal Investment Summary

System Renewal	# Projects	Total $	% of 2021 System Renewal CAPEX	% of Total 2021 CAPEX
Total	8	$ 8,095,769	100%	42.5%
Materiality > $190,000	6	$ 7,212,102	89%	37.9%
Material Project Drivers				
Overhead Line Renewal	3	$ 4,738,409	58.5%	24.9%
Underground Line Renewal	1	$ 1,435,447	17.7%	7.5%
Proactive Renewal	1	$ 752,106	9.3%	3.9%
Reactive Renewal	1	$ 286,140	3.5%	1.5%
Total	6	$ 7,212,102	89%	37.9%

Table 1-19 provides an overview of WNH's System Renewal investments for 2021 and the primary drivers for each investment project/program. System Renewal investments are primarily driven by assets that have been identified through inspection, testing, maintenance or performance to be in poor condition and at end-of-life. WNH's System Renewal investments are broken down into four major program areas. Overhead Line and Underground Line renewal are planned investments informed by WNH's Asset Condition Assessment program. Proactive renewals occur when assets in poor condition are discovered as a result of yearly inspection and maintenance programs and which require immediate replacement to prevent safety or reliability concerns. Reactive renewals occur when assets fail while in service and must be replaced to restore power to customers or correct an unsafe condition. Proactive and reactive renewal investments are forecast based on historical activity levels. These investment drivers are typical and support WNH's strategic imperatives of Reliability, Safety, and Customer Service.

Overhead Line Renewal

This work involves three separate but related programs for the replacement of approximately 620 wood poles, conductors and devices in poor and very poor condition as identified by WNH's Asset Condition Assessment program. The programs are differentiated by projects that involve like-for like replacements, failing conductor or conversion from 8.32 kV to 27.6 kV.

Underground Line Renewal

The majority of the proposed work involves the replacement of approximately 7.1 km of direct buried XLPE primary cables along with associated submersible transformers, below grade concrete vaults, secondary service cables.

This is WNH's oldest underground infrastructure. Concrete vaults have found to be flooding and physically deteriorating due to salt and corrosion and secondary cable insulation is showing signs of embrittlement; a sign of oncoming failure. Numerous vaults are located in sidewalks and boulevards where physical deterioration can present a public safety hazard. Although the primary cable is in Fair condition the direct buried nature of this infrastructure makes it much costlier and time consuming to repair, replace in piecemeal, or replace in whole on a reactive basis. WNH has determined that the best course of action is to replace this infrastructure in a planned manner, coordinated with our customers.

Proactive Renewal

Proactive renewal expenditures are forecast based on historical trends. In 2021, the forecast expenditure is $752,000, slightly below the 2016 – 2020 annual average or $804,000. WNH experienced a peak in proactive renewal activity in 2019 and forecasts 2020 and 2021 to be more typical of previous forecast years.

Reactive Renewal

Reactive renewal expenditures are also forecast based on historical trends. In 2021, the forecast expenditure is $286,000, well below the 2016 – 2020 annual average or $402,000. WNH has seen a downward trend in Reactive Renewal expenditures since 2016 and is expecting that trend to continue into 2021.

1.4.3.3. System Service

Table 1-20: 2021 System Service Investment Summary

System Service	# Projects	Total $	% of 2021 System Service CAPEX	% of Total 2021 CAPEX
Total	5	$ 2,293,605	100%	12.0%
Materiality > $190,000	4	$ 1,807,067	79%	9.5%
Material Projects/ Programs				
Grid Modernization	1	$ 909,220	40%	4.8%
Stations Equipment Upgrades	1	$ 406,567	18%	2.1%
Contingency Enhancement	1	$ 291,280	13%	1.5%
Grid Resiliency	1	$ 200,000	9%	1.0%
Total	4	$ 1,807,067	79%	9.5%

Table 1-20 provides an overview of WNH's System Service investments for 2021 and the primary drivers for each investment project/program. WNH's System Service projects represent investments aimed at improving system operations, reliability and efficiencies through distribution automation, intelligent devices or equipment, all aimed at operational effectiveness and consistent service delivery.

Grid Modernization

In 2021, WNH is proposing to make investments in expanding self-healing networks that will increase the number of customers benefiting from this technology. SCADA operated switched capacitors will also be added to better regulate feeder voltages.

Station Equipment Upgrades

There are numerous investments being made in this category to improve physical and data security, real time monitoring, communications, and safety at WNH's transformer stations.

Contingency Enhancement

These investments provide additional circuits and SCADA controlled electronic reclosers at strategic locations in WNH's distribution system to improve load transfer capabilities between transformer stations and feeders. These improvements will also reduce customer restoration times during certain transmission, station and distribution loss of supply contingencies, ease congestion points on the distribution system during abnormal configurations and increase the opportunities to remove equipment from service for maintenance without interrupting the supply to customers.

Grid Resiliency

Investments in 2021 include moving a number of residential services from overhead to underground in WNH's most heavily treed areas. Overhead services are highly vulnerable to falling tree branches during storm conditions. Power restoration is slow as there is normally collateral customer equipment damage which requires a licenced electrician to repair and the Electrical Safety Authority (ESA) to inspect. This initiative was added to the DSP in response to feedback from WNH's 2019 customer engagement activities.

1.4.3.4. General Plant

Table 1-21: 2021 General Plant Investment Summary

General Plant	# Projects	Total $	% of 2021 General Plant CAPEX	% of Total 2021 CAPEX
Total	8	$ 2,818,876	100%	14.8%
Materiality > $190,000	5	$ 2,058,117	73%	10.8%
Material Projects/ Programs				
Fleet Trucks	1	$ 735,187	26%	3.9%
MS/DS Decommissioning	1	$ 462,762	16%	2.4%
Information Technology Asset Lifecycle	1	$ 327,946	12%	1.7%
Operational Technology Software	1	$ 281,522	10%	1.5%
Building & Furniture Improvements	1	$ 250,700	9%	1.3%
Total	5	$ 2,058,117	73%	10.8%

Table 1-21 provides an overview of WNH's General Plant investments for 2021 and the primary drivers for each investment project/program. The capital investments under this category include investments in motor vehicle fleet, equipment and tools, buildings and facilities, computer hardware, software systems and land rights. These investments are driven by the objectives to improve employee safety, worker productivity and operating efficiency.

Fleet / Rolling Stock

WNH's Fleet Management plan is based on the age and condition of these assets. WNH also takes a levelized approach to targeted replacements where possible. The material 2021 fleet investments include one large vehicle (55' double bucket truck) and three smaller vehicles. These units are in a deteriorated condition and past their typical useful life; 14 years for the large vehicle and 10 years for the smaller vehicles.

MS / DS Commissioning

This work is to complete demolition of site structures, environmental remediation of soils and ground water, and disposal of these former station properties. These are relatively small properties that vary in location, size, environmental condition and market value. Costs are estimates based on previous similar projects. Due to the timing of the work, there are no proceeds from sale expected in 2021.

<u>Information Technology Asset Lifecycle</u>

These investments are directly related to capital work on hardware or software and other IT technology assets. They involve various purchases of laptops, workstations, servers and software that are no longer supported or obsolete. Typical items in this category require less labour and cost to replace rather than maintain. These investments support WNH’s efforts in improving operational efficiencies

<u>Operational Technology Software</u>

WNH’s GIS provider, Environmental Systems Research Institute (ESRI) is ending support for WNH’s current Geometric Network version of GIS software. The current geometric network based GIS technology was developed in the 80's and due to the limitations of this 30+ year old technology, this system will have reached the end of its useful life and is ending support for this technology by January 2024. At that time support, maintenance and security updates to their existing offering, as well as their accompanying applications will no longer be available to users. This investment is needed to allow WNH to migrate to ESRI’s new version of GIS software and take advantage of improved efficiencies in this area.

WNH is also making an investment in Mobile Apps and Web services to improve efficiency of asset data collection.

<u>Building & Furniture Improvements</u>

This program provides for the replacement of furniture, tool and equipment associated with WNH’s Administration and Service Centre building. No individual item is above the threshold of materiality.

2. (5.2) DISTRIBUTION SYSTEM PLANS

Section 2.0 of this DSP is organized to follow OEB Chapter 5, Section 5.2.

1. Section 2.1 provides a DSP Overview **(5.2.1 “a” to “h”).**
2. Section 2.2 summarizes coordinated planning with third parties **(5.2.2, “a” to “d”).**
3. Section 2.3 covers performance measurement for continuous improvement **(5.2.3, “a” to “d”)**.
4. Section 2.4 summarizes the realized efficiencies due to smart meters. **(5.2.4)**

2.1. (5.2.1) Distribution System Plan Overview

This section provides the OEB and stakeholders with a high-level overview of the information filed in WNH’s DSP including; key elements of the DSP; an overview of how projects address customer preferences; sources of expected cost savings; the period covered by the DSP; the vintage of the information; a summary of important changes to WNH’s asset management processes; and aspects of the DSP that are contingent upon the outcome of ongoing activities or future events.

2.1.1. (5.2.1a) Key Elements of the DSP

- *… that affect its rates proposal especially prospective business conditions driving the size and mix of capital investments needed to achieve planning objectives.*

The DSP reflects, in its scope and focus, the most important aspects of constructing, operating and maintaining an electrical distribution system. The activities set out in the DSP are the main drivers for WNH’s capital, operating and maintenance (O&M) expenditures.

An overview of historical and forecast capital expenditures are provided in **Figure 2-1** and **Figure 2-2**. Expenditure levels in 2016 were not typical as a result of the Waterloo Region Light Rail Transit (LRT) project. Once completed, expenditures began to return to levels more consistent with WNH’s investment plans. WNH does not foresee any large investments of similar scale to the LRT over the forecast period and expects year-over-year capital expenditures to stabilize. Capital expenditures in 2022 and 2023 are elevated over 2021 due to WNH's planned investment in a new Enterprise Resource Planning Software (ERP) system. More information is provided later in **Section 2.1.1.3**.

Key elements of WNH's investment plans are in the area of System Renewal and System Access. Over the forecast period these two categories account for 78% of total planned capital expenditures.

Figure 2-1: Historical and Forecast Capital Expenditures ($)

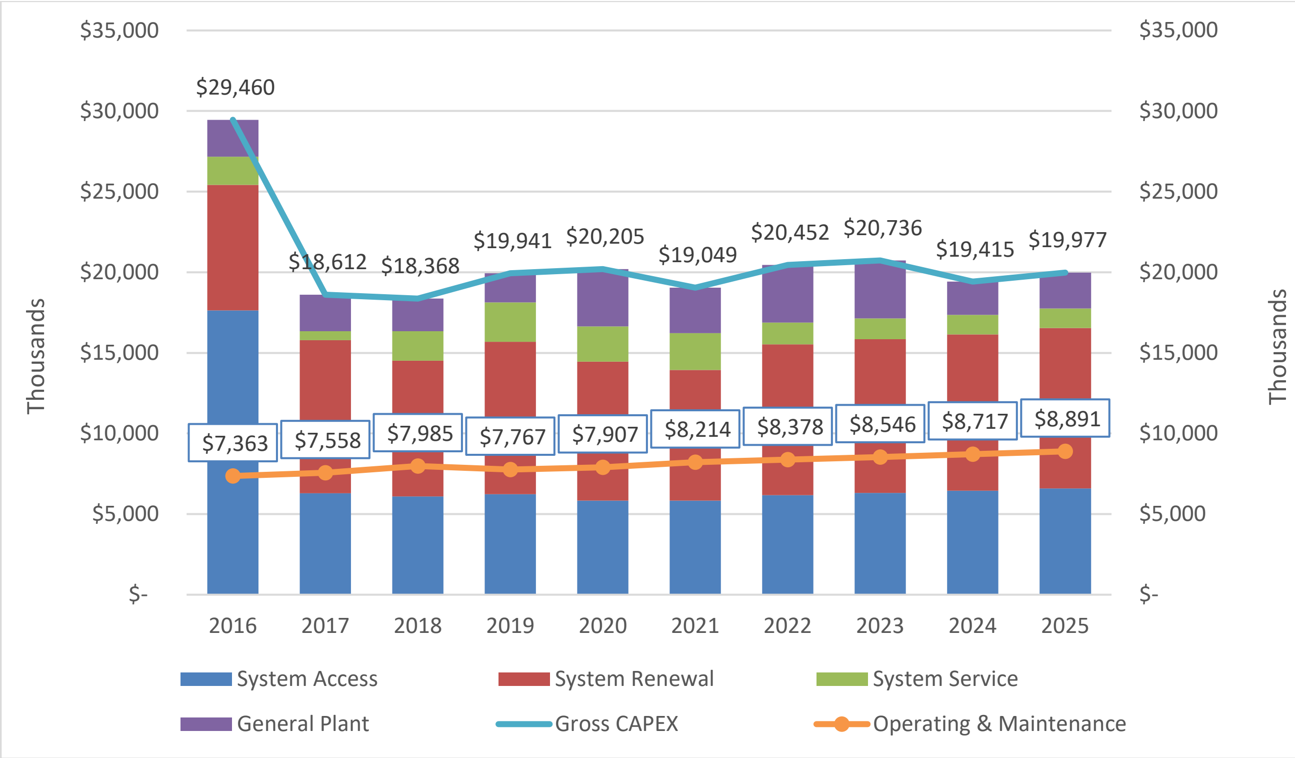
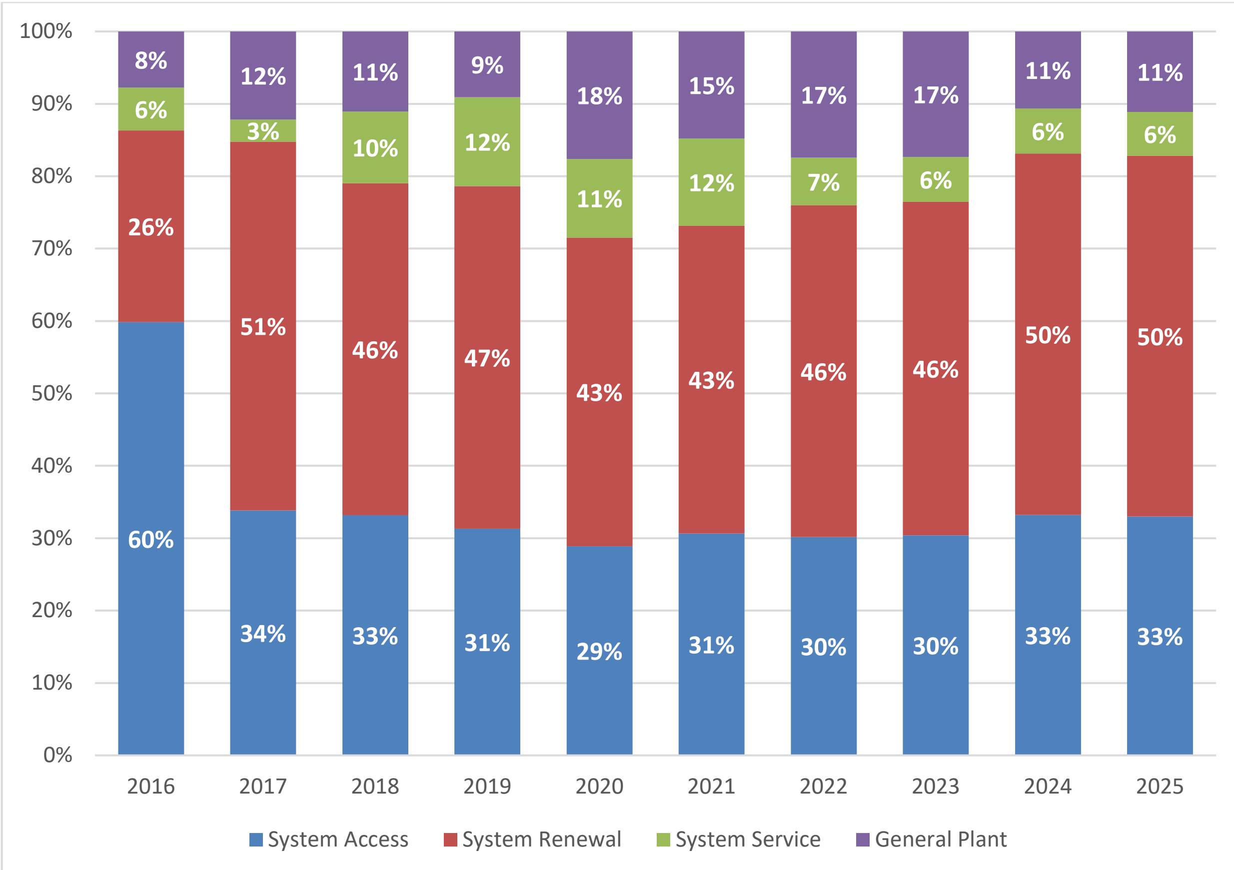


Figure 2-2: Historical and Forecast Capital Expenditures (%)



2.1.1.1. Key Element - System Renewal

System Renewal investments represent the largest component (46.8%) of WNH's forecasted investment plan. WNH has forecast annual average expenditures of $9.33 million between 2021 and 2015, up from an annual average of $8.75 million over the 2016 – 2020 historical period, a 6.6% increase. In 2021 WNH plans to invest $ 8.1 million in asset renewal, representing 42.5% of total annual capital expenditures. These investments involve replacing end-of-life assets or refurbishing assets to extend their original service life, which ever is more cost effective. They are instrumental in reducing the risk of critical asset failures, maintaining reliability and safety performance measures and keeping expensive reactive maintenance activities to a minimum.

Planned investments in this category are primarily driven by WNH's Asset Condition Assessment program which includes regular inspections, testing and performance criteria measurement. Health indices are established using a condition assessment framework developed with the assistance of METSCO. Detailed information regarding the demographics of WNH's assets can be found in **Appendix A** – WNH Asset Condition Assessment (ACA) Report**.**

WNH's System Renewal investments are broken down into 5 areas in order of expenditure.

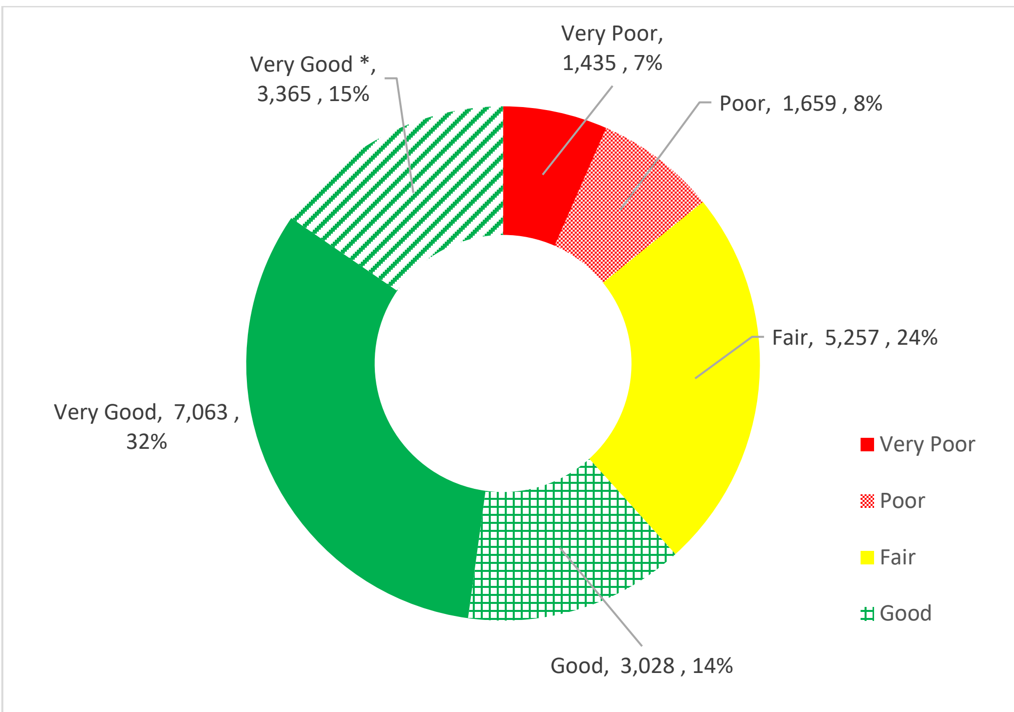
1. Overhead Lines Renewal (planned)
2. Underground Lines Renewal (planned)
3. Transformer Stations Renewal (planned)
4. Proactive Renewal (unplanned) – assets found to be in poor condition during inspection or testing, have not yet failed and require immediate replacement.
5. Reactive Renewal (unplanned) – assets that have failed and require immediate replacement.

Overhead Lines Renewal

These investments represent WNH's largest asset class and largest portion (24.9%) of 2021 total capital investments. WNH has a population of 21,807 poles, 97% of which are wood. Pole condition is the main driver in overhead line renewal projects. Currently 1,435 (6.6%) poles are in Very Poor condition and 1,659 (7.6%) are in Poor condition. **Figure 2-3** illustrates the breakdown of the health condition of WNH's pole population.

WNH's System Renewal investment plan includes the replacement of approximately 620 poles annually over the forecast period.

Figure 2-3: Pole Health Indices

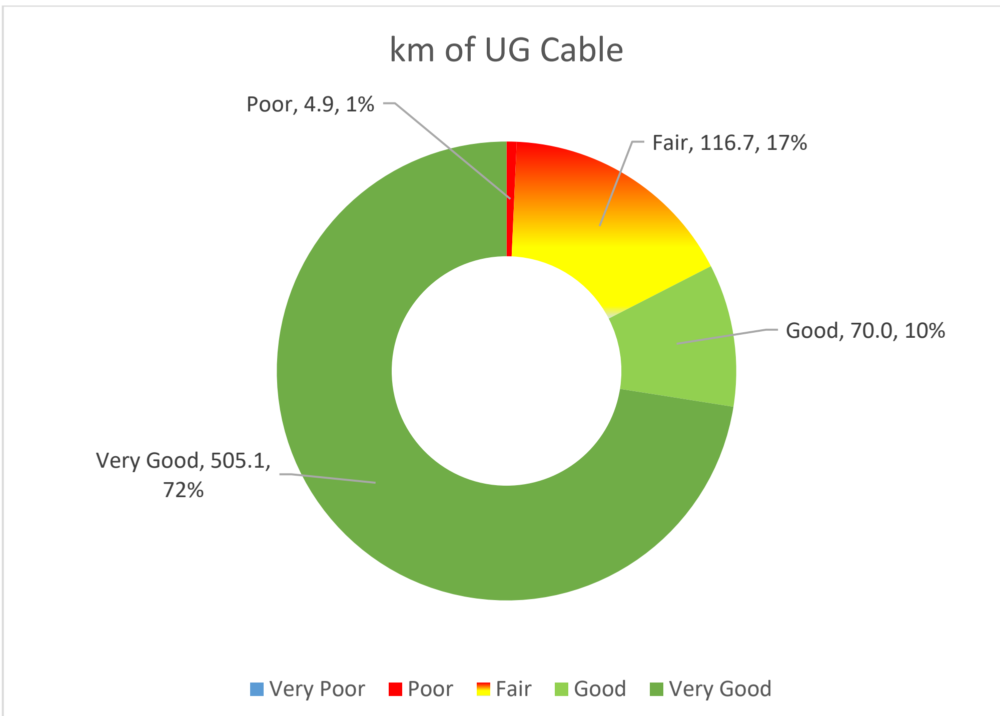


* These are poles installed within the last 3 – 6 years that have not yet been inspected or tested due the frequency of inspection cycles.

Underground Line Renewal

These investments represent WNH's second largest asset class and (7.5%) of 2021 total capital investments. WNH has a population of 9,380 cables for a total length of 697 km, most problematic of which are the 138 km of direct buried cable and associated underground transformers and vaults. WNH's direct buried cables are XLPE type with a TUL of 35 years. Currently 4.9 km (0.7%) of direct buried cable is in Poor condition and 116.7 km (17%) are in Fair condition. **Figure 2-4** illustrates the breakdown of the health condition of WNH's cable population.

Figure 2-4: Cable Population by Health Indices



During the forecast period, WNH's System Renewal plan will be to replace all direct buried underground cables in Poor condition. In addition, WNH plans to begin to proactively replace approximately 35.5 km (29%) of direct buried cable currently rated in Fair condition. WNH is concerned with the large number of cables past TUL and approaching Poor condition. The cables being targeted are those approaching the Poor condition and are expected to reach this condition over the forecast period. These direct buried cables currently have an average age of 34 years with the oldest being 46 years of age. Their replacement, along with the associated submersible concrete vaults and transformers, is logistically difficult, disruptive and time consuming.

Over the forecast period, WNH plans to replace approximately 7.1 km of direct buried cable annually. For the entire population of cable in Fair condition, this represents approximately 17 years of work at this pace. The youngest cable currently in this group would be 44 years of age at the competition of the program. As with all programs, WNH will evaluate annually and adjust the pace accordingly.

Lastly, 80% of WNH's cable population is now in duct. This allows WNH to replace cables on an individual basis with much less cost and disruption. The vast amount of cable in duct is of the TRXLPE type with a TUL of 45 years. There are no planed replacements of cable in duct over the forecast period.

Transformer Station Renewal

There are no large project drivers for station investments over the forecast period. Various planned capital replacements are proposed to maintain the safety and reliability of WNH's stations. WNH is planning to retire one 8.32 kV Distribution Station in 2020 and none over the forecast period.

Proactive Renewal

Increased expenditures over the forecast period are reflective of WNH's inspection and testing programs identifying assets in poor condition and replacing them prior to failure. These expenditures represent approximately 9.3% of total System Renewal expenditures.

Reactive Renewal

Reactive Renewal expenditures have decreased over the historical period; indicative of fewer assets having to be replaced under failed conditions. These expenditures represent approximately 3.5% of total System Renewal expenditures.

DSP IMPACT

The number of assets at or nearing end-of-life over the forecast period are a reflection of the increase in assets installed during the expansion boom of the 1950's, 60's and 70's. WNH has attempted to pace its System Renewal investments plan; however, the forecast period will see a 6.6% average annual increase over historical period expenditures. It is expected there will be sustained upward pressure on asset renewal expenditures for the foreseeable future.

2.1.1.2. Key Element - System Access

System Access investments represent the second largest component (31.5%) of WNH's forecasted investment plan. System Access expenditures in 2016 were significantly influenced by the LRT project**; Figure 1-9** illustrates the impact. More normalized results can be obtained by using 2017–2020 data.

WNH has forecast annual average expenditures of \$6.27 million, up slightly from \$6.12 million over the 2017 – 2020 historical period, a 2.5% increase. In 2021 WNH plans to invest \$5.73 million in 6 material projects, representing 30.1% of total annual capital expenditures.

WNH's proposed System Access investments are centered on 3 major areas;

1. Growth - Customer Requests for Expansions & Connections
2. Roadway Relocations
3. Retail Meters

Growth in Customer Expansions & Connections

The Region of Waterloo is the 10th most populous Census Metropolitan Area (CMA) in Canada, with 583,500 residents in 2016. On Thursday February 13, 2020, Statistics Canada released a report examining population growth across the country. Based on the most recent census, the Region of Waterloo CMA led the country with a 2.8 per cent increase.

Although still growing, Waterloo in particular does not share equally in the Region's population growth. In contrast, since 2016, WNH's customer growth rate has experienced a steady decline from 1.4% to 0.7%. **Table 1-5** illustrates the historical and projected growth in customer base by Rate Class and **Table 2-1** illustrates regional population and employment forecasts from the Region of Waterloo.

A decreasing inventory of developable greenfield land, and the increasing penetration of bulk metered high rise condominium style housing within WNH's service area, has resulted in the slowing of growth of WNH's customer base. WNH does not foresee a change in this current business climate over the forecast period.

Table 2-1: Regional Population and Employment Forecasts

Municipality	2006 Population	2031 Population	2006 Employment	2031 Employment
Cambridge	123,900	176,000	75,020	102,500
Kitchener	214,500	319,500	99,380	132,500
North Dumfries	9,200	16,000	6,080	8,700
Waterloo	**101,700**	**140,000**	**64,070**	**89,000**
Wellesley	**10,100**	**12,500**	**3,290**	**4,300**
Wilmot	17,700	28,500	6,730	10,000
Woolwich	**20,100**	**36,500**	**13,540**	**19,000**
Region	497,200	729,000	268,310	366,000

(from the Region of Waterloo Official Plan)

Table 2-2 provides historical actual and forecast estimates for connections.

Table 2-2: Customer Connections – Historical and Forecast

OEB Investment Category	Year	Subdivision Lots Serviced	New Residential Services	New Commercial Services
	2016	449	552	36
Historical Period	2017	529	514	32
	2018	485	317	24
	2019	226	555	17
Bridge Year	2020	385	485	20
Test Year	2021	286	460	24
Forecast Period	2022	205	440	26
	2023	163	325	24
	2024	240	325	22
	2025	342	350	22

Setting aside 2016 System Access expenditures which were significantly influenced by the Waterloo Region Light Rail Transit (LRT) project, average forecast System Access expenditures vary little from historical values. **Table 2-3** illustrates the significant impact the LRT project posed on historical System Access Expenditures.

Table 2-3: System Access Historical vs Forecast Annual Expenditures

OEB Investment Category	Historical Average 2016 - 2020	Forecast Average 2021 - 2025	Forecast – Historical DIFF	% DIFF
System Access	$ 8,420,094	$ 6,270,358	$ (2,149,736)	-25.5%

OEB Investment Category	Historical Average 2017 - 2020	Forecast Average 2021 - 2025	Forecast – Historical DIFF	% DIFF
System Access	$ 6,118,076	$ 6,270,358	$ 152,282	2.5%

System Access needs for new connections and expansions are expected to remain near 2021 levels over the forecast period.

Roadway Relocations

The municipal road authorities along with the Ministry of Transportation Ontario (MTO) have ongoing road rehabilitation and widening projects, many of which require the relocation of WNH plant. There are approximately 5 road widening projects scheduled for 2021 totaling approximately $1.0 million. This level of activity is expected throughout the forecast period.

Retail Meters

Over the historical period, annual expenditures in retail meters averaged $630,000. With no major change in investment drivers, WNH forecasts similar expenditure levels for the 2021 – 2025 forecast period.

DSP IMPACT

Overall, the forecasted System Access expenditures are expected to remain in line with historical levels.

2.1.1.3. Key Element - General Plant

WNH's capital investments in this category are many and various. Drivers are divided into a number of areas including fleet / rolling stock; buildings and facilities; information technology hardware and software; and intangibles.

A key element of General Plant expenditures will be the replacement of WNH's 15-year-old Enterprise Resource Planning Software (ERP). WNH's current ERP system, which was a mature product at the time of its installation in 2005 is at end-of-life. The replacement is expected to occur in 2022 and 2023 at an estimated cost of $2.5 million. This will be the single largest expenditure in this category over the forecast period.

WNH paces General Plant investments to help facilitate the smoothing of the overall capital expenditure plan where ever possible.

DSP IMPACT

Annual General Plant expenditures averaged approximately $2.39 million over the historical period. WNH forecasts that annual average General Plant expenditures will increase to approximately $2.85 million of which $500,000 annually is due to the purchase of the ERP system.

2.1.1.4. Key Element - System Service

Over the forecast period, WNH will be making incremental investments in grid modernization, capacity transfer and system operation and safety. These investments are instrumental in maintaining reliability and safety performance measures as well as improving overall efficiency of the distribution system.

WNH's historical System Service expenditures averaged $1.76 million annually. Annual expenditures in System Service are forecasted to be approximately $1.47 million annually, a 16.3% reduction below historical spending levels. Greater detail is provided in **Section 4.1.1.**

DSP IMPACT

Forecast Annual System Service expenditures are expected to decrease by $286,000 or 16.3%

2.1.1.5. Key Element - System Load

WNH's station and feeder capacity and loadings indicate that there is sufficient capacity to accommodate growth over the period of the DSP.

DSP IMPACT

No extraordinary expenditures to accommodate load growth are forecasted in this DSP. Investments in grid modernization, capacity transfer and system renewal will provide WNH with opportunities to better utilize existing capacity.

2.1.1.6. Key Element – Conservation & Demand Management

Under the 2015 to 2020 Conservation First Framework, Waterloo North Hydro (WNH) was allocated 82.38 GWh's of energy savings. Through the engagement of WNH's customers in energy efficiency programs, by the midpoint of the framework, WNH had achieved 55.9 GWh's or 68.0% of the target. By the end of 2018, WNH had achieved 72.4 GWh's or 87.9% of the target, and WNH projects to achieve 90.8 GWh's or 110.2% of the target by the end of 2020. WNH's energy efficiency savings are expected to persist at an annual rate of 99% over the forecast period.

DSP IMPACT

CDM has had an impact on net system load growth over the historical period and WNH expects these impacts to persist over the forecast period. Targeted savings are not expected to have a significant impact on DSP category spending during the forecast period.

2.1.2. (5.2.1b) Overview of Customers' Preferences and Expectations

- *… how projects or initiatives address customers' preferences and expectations*

The feedback received from customer consultations informs WNH's asset management plans and helps shape annual plan development and this DSP. This section provides an overview of changes made to the DSP as a result of those consultations.

Details of the extensive consultations conducted by WNH including customer preferences and expectations are described in **Exhibit 1, Customer Consultation.** **Appendix L** contains the detailed results from WNH's customer engagement efforts in identifying their needs and preferences.

The following is a summary of changes made to the capital investment plan as a result of WNH's customer engagement activities.

1) While cost is not a number one priority for customers, for some cost is very important. WNH revisited its OM&A expenses and found opportunities to cut $242,393. The majority of these decreases were in delaying or staggering start dates of new employees due to retirements, removal of one customer service position and some adjustments to contracted services that can be brought in house. While WNH believes these cuts to be manageable, further cuts to areas such as customer service will hurt customer service quality which it was determined that customers do not want.

2) A significant group of customers would like more overhead services moved underground. While this is not the majority, WNH determined that this customer group was large enough to make adjustments in the plan. WNH reviewed the rebuild areas and have added $200,000 to the capital budget in 2021 to move some sections of overhead services in heavily treed areas to underground services. This will accomplish two things: 1) will decrease the risk of outages in these areas and 2) will improve aesthetics.

3) A large theme that came from this customer engagement that was not as evident in the 2016 COS is that there is a focus by customers on innovation. Customers would like WNH to focus on innovative investments in both systems and renewable opportunities and are willing to pay for it. WNH has made an adjustment to increase the 2020 capital budget by $173,500 to install innovative, customer friendly upgrades to its CIS. Some of these upgrades include:

- Better communication (outage notifications, pro-active high bill alerts and payment reminders, campaigns around electrical safety)
- Self-service online (interactive website, online chat, comparing usage with area)
- Summary billing (a single invoice for customers with multiple premises)

4) On a similar note, WNH has been investing in smart switches and reclosers since 2010. This was an area that customers, in particular the business customers were impressed with and supported. WNH has increased the investment in reclosers by $48,655 in 2021.

5) While customers largely agreed with the proposed plan and spending, modifying the plan to accommodate the aforementioned customer preferences did increase 2021 forecast capital expenditures by approximately $422,000. To accommodate these preferences and being sensitive to the customer's feedback on cost sensitivity, WNH further adjusted the plan to delay the capital spend for a new Enterprise Resource Planning System (ERP). The original ERP planned spend of $1.25 million in 2021 has been deferred to 2022.

6) Although not a change to the plan, after the government cancelled funding for the Conservation First Framework, WNH made a decision to retain two Key Accounts employees to help customers with cost savings and demand reduction. These former CDM employees will play a large role in assisting all WNH customers with energy efficiency, energy planning, general customer communication and education. It was clear from the consultations that WNH business customers in particular, supported this initiative and that energy efficiency and electrical safety education are very important.

WNH also took the opportunity at this time to make adjustments to the budget that were found between the first budget and rate impacts but were not due to customer engagement efforts. Revenue offsets were increased by $209,633, mainly due to an increase in pole attachment rates since the last COS. Adjustments were made to borrowing requirements which decreased the interest expense by $196,257. There were additional non-material increases to depreciation (due to capital changes noted above) and a small increase to the Low-income Energy Assistance Program (LEAP) based on the change to revenue requirement from the last COS. These changes will decrease the rate impact that was provided to customers during customer engagement.

WNH communicates with unmetered load customers, including Street Lighting customers, to assist them in understanding the regulatory context in which distributors operate and how it affects unmetered load customers. This communication takes place on an on-going basis and is not driven by the rate application process, but regular business practice. The customers who are part of these rate classes have accounts in other rate classes as well and were invited to participate in the customer engagement activities previously discussed.

Overall, many customers commented that while they do not like cost increases, they found the process to be very informative and helpful to understanding WNH's business. They also felt engaged and were satisfied with being consulted.

On-bill messaging, bill inserts, television advertising, re-formatting the bill and general radio and newspaper advertising will continue to be utilized to assist with the education process and to address top customer priorities.

WNH will continue its ongoing customer engagement activities and will continue to take customer preferences into consideration in its business planning. Customer engagement and satisfaction will continue to be a top priority for WNH.

2.1.3. (5.2.1c) Expected sources of Cost Savings

- *… expected to be achieved over the forecast period through good planning and DSP execution:*

The sources of cost savings expected to be achieved are included in the following sections.

2.1.3.1. Retirement of 4.16 kV and 8.32 kV Distribution Assets

System Renewal investments made between 2016 – 2019, allowed WNH to retire the last five of its 4.16 kV municipal transformer stations from service. WNH has also been able to retire all of the remaining 4.16 kV lines and distribution transformers in the City of Waterloo and the Town of Elmira. Similarly, WNH has retired two 8.32 kV rural stations. One more station is planned for retirement by the end of 2020.

Portions of the remaining 8.32 kV lines in the rural areas will continue to be retired over the forecast period through continuing renewal investments. These assets have been replaced with ones that operate at higher voltages and are more efficient.

New lines generally incorporate higher voltages, larger conductor and increased pole strength. As a result, the distribution system is better able to withstand poor weather conditions; provide increased capacity and siting options for the connection of renewable energy generation, electric vehicles, energy storage; provide increased physical space for third party communications and smart grid devices; and reduce power quality issues and losses.

Elimination of 4.16 kV and 8.32 kV assets reduces the need to stock parts/equipment specific to that voltage class, leading to supply chain and inventory efficiencies.

The retired stations referred to above are currently in various stages of decommissioning and environmental remediation. Once work is complete, O&M savings will be approximately $19,000 annually for each station. WNH also avoids the need for further capital renewal investments for the related distribution station buildings & equipment.

2.1.3.2. System Losses

WNH's 2019 system losses have been calculated to be 3.2% of purchased energy. The five-year average from 2014 – 2018 is 3.5% having fluctuated between 3.2% and 3.7%. This is well below the OEB's recommended threshold of 5% as set out in the OEB's document "Ontario Electricity Distributor Practices Relating to Management of System Losses (June 23, 2008)". WNH's loss factor is also consistently lower than the Ontario LDC average of 3.8% over the same period. Annual savings from lower losses flow directly to the benefit of WNH's customers by lowering the cost of power.

2.1.3.3. Grid Modernization Technologies

The roll out of grid modernization technologies such as an AMI, OMS and other smart devices such as electronic line reclosers and sensors has reduced man-hours and truck rolls required to identify and locate the causes of power outages. WNH estimates that current savings in operating costs are approximately $40,000 annually. These savings are built into the budgeted and forecasted OM&A amounts.

WNH has implemented Survalent's Fault Location, Isolation, and Service Restoration (FLISR) software application that combined with SCADA and other grid modernization devices, reroutes power in the event of a fault to restore power to as many customers as possible, as quickly as possible. These technologies provide automatic self-healing on the portions of the system unaffected by the fault, ultimately improving restoration times. Since 2016, in areas where these technologies have been implemented, WNH customers have saved approximately 6.6 million minutes of interruption, averaging 1.64 million minutes saved annually. In 2019 WNH estimates 1.7 million customer minutes were saved; a 30% reduction in outage minutes. WNH customers have also experienced a steady decline in momentary interruptions (MAIFI) since 2015; a 50% reduction from 6.44 to 3.19 annual interruptions per customer.

In addition, shorter restoration times reduce the customer's lost revenue associated with a loss of power event. WNH has yet to quantify the value to customers of interrupted service, however, WNH expects these savings to increase as it expands these technologies over its remaining customers.

These investments also improve situational awareness of operating staff during power outage events leading to more informed, effective and efficient restoration of power to customers.

2.1.3.4. Material Standardization

The uprating to higher operating voltages that comes with System Renewal investments in overhead and underground lines reduces the quantity and variety of inventory components for 4.16 kV and 8.32 kV equipment. WNH also participates in joint purchasing through its participation in the 15 member GridSmartCity Cooperative. WNH benefits from material standardization and joint purchasing initiatives by being able to more easily share materials with other utilities during storm events.

2.1.3.5. Utility Standards Forum

WNH is a founding member of the Utilities Standards Forum (USF), an organization consisting of 53 Ontario LDCs that pool resources, initiatives and funding in the areas of Engineering, Operations, Regulatory, Customer Service and IT program management. WNH continues to realize savings in the form of reduction of effort through the use of: common standards development; staff training; shared policies process and product discovery; and ready access to the expertise of other utilities for consultation and problem solving.

In addition to design standards, the USF Engineering Forum has developed guidelines for asset inspection, joint use attachment agreements, non-linear pole loading analysis, and tendering.

Regulatory and Customer Service Forums have worked with members on items such as: review of disconnection notices for compliance with DSC; production of a reference guide for RRR filing and DSC definitions; and review of Economic Evaluation models for compliance with the DSC.

WNH has also contributed to and benefited from the USF IT Forum where members need to meet many of the same requirements and often face the same challenges. Practical examples of this include but are not limited to, shared strategies in meeting the OEB Cyber Security Framework; standard contract appendices for technology agreements regarding SLAs, Cyber Security and breach notification.

2.1.3.6. Resource Allocation

WNH has a long established practice of cross training staff in key areas to better allocate resources and adjust to shifting work programs. As new subdivision underground design has decreased at WNH, staff have been able to move to areas of increased workload such as overhead renewal, generator connections and overhead line relocation design. Line staff rotate through overhead and underground areas regularly so as to be familiar with technologies and practices in both areas. WNH’s stations staff were formed into one cohesive workgroup and take a holistic approach to maintaining stations equipment rather than the traditional approach of having multiple groups with overlapping responsibilities.

These and other efforts make for more efficient work programs; keeps employees engaged in their work and reduces risk of staff turnover. One of the greatest benefits to these initiatives arises during storm and power outages when more qualified assistance is available to respond.

2.1.3.7. Maintenance

Proactive maintenance programs assist assets in reaching their life expectancy and in some cases, can extend asset life. Although some capital expenditures may be deferred, these activities have a tendency to increase O&M costs.

2.1.3.8. Tools & Equipment

WNH looks for opportunities in the purchase of tools, equipment and systems, to select those that offer labour saving capabilities. WNH has had positive experiences with automated testing equipment, battery powered hand tools, enhanced design software, field tablets and more. These are incremental savings that help to reduce the upward pressure on future O&M costs.

2.1.4. (5.2.1d) Period covered by the DSP (historical and forecast years):

This DSP spans a five-year historical period covering 2016 to 2020 and a five year forecast period covering 2021 to 2025. The Bridge Year and Test Year are 2020 and 2021 respectively.

2.1.5. (5.2.1e) Vintage of Information

- *… on investment drivers used to justify investments identified in the application:*

Unless otherwise stated, the information contained in this report is current as of December 31, 2019.

2.1.6. (5.2.1f) Important Changes to Asset Management Processes

- *… where applicable, indication of any important changes to the distributor's asset management processes (e.g. enhanced asset data quality or scope; improved analytic tools, process refinements; etc.) since the last DSP filing:*

This is WNH's second DSP under the Ontario Energy Board's "Chapter 5 Consolidated Distribution System Plan Filing Requirements".

Since its last application, WNH has embarked upon a program to improve its Asset Management processes. Improvements include:

- WNH’s introduction of METSCO Energy Solutions Inc. (METSCO) Asset Analysis, Prioritization and Optimization Tool (ENGIN) and Health Index Frameworks to assist in the preparation of its asset management plans. The Health Index Frameworks cover WNH’s major asset categories and brings greater standardization to asset condition assessment criteria and asset health grading.
- improvements that have been made in data collection, validation and warehousing processes to enhance the completeness and quality of the data.
- the use of electronic hand held devices for the collection of field inspection and asset condition assessment data has also been implemented to improve the process efficiency.

These initiatives are part of WNH’s continuous improvement process for asset management.

2.1.7. (5.2.1g) Potential Impacts to DSP

- *… aspects of the DSP 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:*

In order of potential impact, the following activities have been identified:

2.1.7.1. Customer Connections

Customer connection forecasts are based on information received from municipal planning staff, planning reports (provincial, regional, municipal), developer submissions and inquiries, and historical connection rates. Changes in customer plans will impact connection timing/quantity and related System Access expenditures over the forecast period of the DSP. These changes can come about at any time and are not known to WNH at this time.

2.1.7.2. Regional Planning

WNH has been working with Kitchener-Wilmot Hydro Inc. (KWHI), Energy+, Guelph Hydro Electric Systems Inc. (Alectra), HONI Distribution (HONI Dx), HONI Transmission (HONI Tx), and the Independent Electricity System Operator (IESO) on the Kitchener-Waterloo-Cambridge-Guelph (KWCG) Integrated Regional Resources Plan (IRRP). This is the second IRRP cycle for this region which is expected to be completed by Q2 2020.

To date there do not appear to be any cost implications for WNH within the forecast period, nor do there appear to be any aspects of the DSP contingent on the outcome of this consultation.

There are no material impacts arising from the IESO review of WNH's REGI Plan and HONI's status letter of on Regional Planning.

2.1.7.3. Municipal Road Relocations

In addition to relocations due to roadway modifications, WNH is experiencing an increase in line relocations due to municipal construction of multi-use trails, sidewalks and bicycle lanes within the road allowances. This work tends to be scheduled with shorter notice periods, making forecasting of expenditures a greater challenge.

Also, as the number of assets from all parties located within road allowances increases, the resulting congestion is creating more requests for electrical lines to be relocated from overhead to underground. It is not unusual to have the municipalities then alter or cancel the project after preliminary designs and cost estimates have been completed.

WNH typically only recovers costs for 50% of labour and labour saving devices for overhead to overhead relocations; however, overhead to underground relocations normally have 100% cost recovery. The variability of costs and cost recovery from plan to construction tends to bring about a greater level of forecasting uncertainty with relocation work.

WNH works with the municipality to avoid these expenditures as much as possible, however they are mandated by regulation and code. Municipal relocation projects for 2021 can be found in **Section 4.2.2** - Material Investments. At the time of filing, WNH is unware of any changes to these plans, nor any plans for 2022 and beyond.

2.1.7.4. Long Term Load Transfer Customers (LTLT)

In 2017, WNH completed the elimination of long term load transfer customers with its neighbouring utilities, HONI Dx, Energy+ and KWHI as per the OEB's "Elimination of Load Transfer Arrangements Board File No.: EB-2015-0006".

As a result, WNH's service area increased by a net 11 sq. km to 683 sq. km. In addition to the City of Waterloo, Township of Woolwich and the Township of Wellesley, WNH now provides regulated electricity distribution services to approximately 127 customers in the Township of Perth East, Township of Mapleton, Township of Centre Wellington, Township of Guelph/Eramosa, and the City of Cambridge. A current WNH boundary map is provided in **Figure 1-2.**

WNH's Electricity Distribution Licence ED-2002-0575 was amended by "Waterloo North Hydro Inc. EB-2017-0245" as of June 29, 2017. There are no impacts on this DSP from LTLT customers.

2.1.8. (5.2.1h) Grid Modernization, Distributed Energy Resources, Climate Change

- *… identification of projects related to cost-effective grid modernization, distributed energy resources, and climate change adaptation and how these projects address the goals of the Long-Term Energy Plan.*

2.1.8.1. Grid Modernization

Table 2-4 lists three material investments in grid modernization that WNH is making in 2021. WNH continues to invest in automated switching devices (reclosers and Vista Gear) to enhance the capabilities of other grid modernization technologies such as OMS and FLISR. WNH has averaged over 1.64 million customer outage minutes saved annually since 2016 and saved customers 1.7 million minutes in 2019. These savings only occurred on the sections of the distribution system enabled with grid modernization technologies. Investments in the forecast years will allow WNH to expand the use of these technologies further into the distribution system allowing a greater number of customers to benefit. These activity aligns with the LTEP goal of “Improving Value and Performance for Consumers” and the OEB directive to “Strengthen Utility Accountability to Customers”.

Table 2-4: Material Investments in Grid Modernization

OEB Category	Project	Program
System Service	2021 Recloser Program	Grid Modernization
System Service	Vista Gear SCADA Control Deployment	Proactive Renewal
System Service	HSA Transformer Upgrade to On-Line Monitoring	Stations Equipment Upgrades

WNH is also investing in condition based, continuous on-line monitoring of its large grid connected power transformers. Being WNH’s single largest valued assets, continuous online monitoring will allow for more timely and less costly intervention if asset health unexpectedly deteriorates. This activity aligns with the LTEP goal of “Improving Value and Performance for Consumers”.

In addition, WNH is making a number of smaller (non-material) investments in grid modernization. WNH needs to continue to invest in wireless and fibre optic communications as the number of Smart Grid devices on the distribution system grows. Also included is an investment in SCADA controlled switched capacitors to improve voltage control on the distribution system. These activities align with the LTEP goal of “Innovating to Meet the Future”.

2.1.8.2. Distributed Energy Resources

Table 2-5 lists two smaller investments in Distributed Energy Resources (DERs) that WNH is making in 2021, both under the threshold of materiality. These investments are to facilitate the connection of generator customers, both REG and Load Displacement.

Table 2-5: Material Investments in Distributed Energy Resources

OEB Category	Project	Program
System Access	Load Displacement Generator Connections	Customer Connections
System Access	Net Metering	Customer Connections

These activities align with the LTEP goal of “Innovating to Meet the Future”.

2.1.8.3. Climate Change Adaptation

Table 2-6 lists 12 material projects that support Climate Change Adaptation.

WNH’s System Renewal programs replace assets that are old and in poor condition allowing the distribution system to be better able to withstand extreme weather conditions. Compared to the assets being removed from service, new assets incorporate higher design standards and stronger materials. This activity aligns with the LTEP goals of “Ensuring a Resilient Energy Supply” and “Improving Value and Performance for Consumers”.

Table 2-6: Material Investments in Climate Change Adaptation

OEB Category	Project	Program
System Renewal	Katherine St (RR23) - Lundy Rd to Crowsfoot Rd	Overhead Line Renewal
System Renewal	Sawmill Rd - Golf Course Rd to Katherine St	Overhead Line Renewal (8 kV)
System Renewal	Boomer Ln - Kressler Rd to Herrgott Rd	Overhead Line Renewal
System Renewal	Bridge St W - University Ave to Lexington Rd	Overhead Line Renewal
System Renewal	Randall Dr/Conrad Pl	Overhead Line Renewal
System Renewal	Downtown Maryhill (St. Charles St & Maryhill Rd	Overhead Line Renewal
System Renewal	Floradale Rd - Arthur St to Cedar Spring	Overhead Line Renewal - Failing Conductor
System Renewal	Golf Course Rd Voltage Conversion	Underground Line Renewal
System Renewal	Kumpf Dr - Randall to Northfield	Overhead Line Renewal
System Renewal	Maryhill Rd - Crowsfoot Rd to FC-8-826	Overhead Line Renewal - Failing Conductor
System Service	Overhead to Underground Service Conversions	Grid Resiliency
System Renewal	Bluevale Rd - Bridgeport to Mayfield Ave	Overhead Line Renewal

WNH's System Renewal program also incorporates voltage conversion where upgrading its 8.32 kV distribution system to 27.6 kV is practical. Distribution systems at higher voltages increase load transfer capability to improve reliability of supply and allows a higher penetration of DERs.

In addition, WNH is making a number of smaller (non-material) investments in System Renewal that support Climate Change Adaptation in a similar manner as mentioned above. These activities align with the LTEP goals of "Ensuring a Resilient Energy Supply" and "Ensuring a Flexible Energy System".

WNH's Grid Resiliency program in 2021 is focused on converting overhead customer services to underground in highly treed areas. Converting these assets supports reliability performance, resiliency and safety with the added benefits of incrementally reducing tree trimming costs. Customers also avoid the cost of repairing damage to their service entrance equipment which can result from storm related tree damage. This activity aligns with the LTEP goal of "Ensuring a Resilient Energy Supply" and "Improving Value and Performance for Consumers".

2.2. (5.2.2) Coordinated Infrastructure Planning with Third Parties

- *A distributor must demonstrate that it has met the OEB's expectations in relation to coordinating infrastructure planning with customers, the transmitter, other distributors, the Independent Electricity System Operator (IESO) or other third parties where appropriate. A distributor must provide the following for any regional planning process, any REG related investments or any other planning initiatives that require coordination.*

2.2.1. (5.2.2a) Summary of Infrastructure Consultations

WNH's infrastructure planning process involves consultations with a variety of stakeholders. Input from the following stakeholders has been taken into consideration by WNH in the development of this DSP;

- Customers;
- Municipal Governments;
- Development Community;
- Independent Electricity System Operator (IESO**);**
- Transmitter (HONI);
- Embedded Distributors: and
- Host Distributors

The following sections describe the third-party consultations in which WNH participated.

2.2.1.1. Customer Engagement

Customer engagement has always been important to the success of WNH. One of WNH's leading Corporate Values is "improving customer relations and loyalty" in which WNH recognizes its commitment to be of service to customers, employees and the community and its contribution to the success of each. WNH engages its customers through day-to-day contact and regular business activities.

WNH has differentiated Customer Engagement into two categories:

- Ongoing Communications;
- Consultations Specific to the Application.

A list of Customer Engagement Activities can be found in **Exhibit 1, Customer Consultation, Appendix 2-AC**. and **DSP Appendix L -** WNH Customer Engagement Reports.

On-Going Communications

Ongoing customer consultations at WNH take on many forms.

i) WNH meets with individual customers, builders and consultants to develop plans for the construction of WNH infrastructure to allow for the connection of the customer. Initiated by either party, the number and location of the meetings vary. WNH produces estimates, layout drawings or even detailed design drawings depending on the nature of the project. Often the municipality and other utilities (i.e. gas, water, telecom) are participants in the process. These consultations do not impact the DSP in a specific manner but enhances WNH's overall infrastructure planning process.

ii) WNH initiates face-to-face customer consultations specifically to solicit feedback on major renewal projects. Customers are invited to meet with WNH staff to review and discuss proposed project plans. These consultations do not impact the DSP in a specific manner but enhances WNH's overall infrastructure planning process. The feedback provided informs and helps shape, not only that specific project's final design, but also future projects.

iii) WNH has Key Accounts staff that help customers with cost savings, energy and demand reduction. They play a large role in assisting WNH customers with energy efficiency, energy planning, general customer communication and education. Initiated by either party, the number and location of the meetings vary. These consultations do impact the DSP in that these costs impact WNH's forecast O&M expenses.

iv) WNH has engaged UtilityPULSE, Simul Corporation to perform Electric Utility Customer Satisfaction Surveys (EUCSS). The UtilityPULSE survey reviewed responses from households and small businesses that pay or look after the electricity bills from WNH. The feedback from customers is evaluated and helps shape WNH's overall business plan and process. The survey has been performed every two years as part of WNH's overall commitment to Continuous Improvement. WNH's last completed a Customer Satisfaction Survey in 2018, and achieved an "A" rating in customer satisfaction. The survey results are provided in the **Appendix L –** WNH Customer Engagement Reports. Among other criterion, the UtilityPULSE Customer Satisfaction Survey measured WNH's customer satisfaction level based on the customer care provided and WNH's company image and management operations. Overall, WNH has met or exceeded Ontario industry customer service metrics.

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 February 2019 WNH commissioned Brickworks Communications to conduct an engagement survey of its customers. The purpose of this survey process was to obtain customer input regarding Waterloo North Hydro's business plans for the period 2021 to 2025, and to gather information from them about service and cost. WNH used the results of the customer engagement to shape the business plan, budget for 2021, and this DSP. Complete copies of the Brickworks Communication Reports are attached in **Appendix L** – WNH Customer Engagement Reports.

A) Phase One Engagement

Based on the experience from its 2016 COS process, WNH amended its process for its 2021 COS customer engagement. WNH determined that customer engagement would be most effective to be completed in two separate phases. Phase one would be a brief survey to gather high level insights, information and feedback from its customers prior to completing its Business Plan. WNH would then use the Business Plan to shape the 2020 and 2021 budgets and this DSP. The second phase would be a series of engagement consultations to ensure that WNH ‘got it right’ when developing its plan using the high level needs and preferences. WNH also used this opportunity to provide more education to customers on the Ontario electrical system, WNH’s role in the system and to clarify areas where the first survey resulted in opposing preferences from customers.

The first phase of consultation included an online survey that was open to all customer classes. WNH promoted the survey with an e-blast to its customer base as well as notifications on its website and social media. The result was 4,355 customers completed the online survey from February 5th - 22nd, 2019 with 96% being residential, 3% - GS<50 kW and 1% - GS>50 kW. From the results, both quantitative and qualitative, the Business Plan was developed based on key themes. It also indicated areas where more customer education was warranted.

The survey results identified that the number one customer priority is to have “Reliable” electricity, followed by “Safe” electricity.

Table 2-7: Key Themes from Phase One Engagement

Priority	Customer Preferences - Next 5 Years
1	WNH provides electricity that is "Reliable" (fewer outages)
2	WNH provides electricity that is "Safe"
3	WNH provides electricity at low cost (at the expense of reliability and customer service)
4	WNH invests in innovative solutions such as smart grid, battery storage, solar and smart home technologies
5	WNH provides excellent customer service

Quantitative results can be found in the Brickworks Communication Reports, **Appendix L** – WNH Customer Engagement Reports.

In addition to the specific questions provided, customers were also asked to provide open ended comments regarding any other areas of interest to them. There were 1,134 comments received in total. These comments were then summarized and grouped under common themes and highlighted in the following table:

Table 2-8: Qualitative Results Summary from Phase One Engagement

Topics	%
Cost is too high, don't want increases	19.2
Positive feedback - happy with WNH	11.5
Looking to improve environmental impact, focus on renewables	10.1
Interest in their own generation or alternatives (while reducing cost)	7.5
Delivery should be based on usage, not flat fee	6.5
Not happy with TOU pricing / consider changing / adding different rate for overnight EV charging	6.1
Delivery fee should already include upgrades, maintenance costs, should not require increases	4.3
Would like adjustments to billing practices (easier registration, quicker billing period etc.	4.3
Prefer underground	4.0
Feel that they are unable to change consumption or price - rentals, businesses, seniors	3.6
Would like discounts for certain groups of customers - students, seniors, rentals	3.4
Reduce power outages, do not like momentary outages, remove more trees to limit outages	3.2
Would like more updated communication channels - move away from telephone, better use of website or online tools	3.1
Want WNH App - check usage, pay bills, compare to neighbours	3.1
Miscellaneous improvement suggestions - remove smart meters, more outage protection around poles/transformers from animal contact and vehicles	2.8
Keep utility local, some would like regional amalgamation consideration	2.0
Concerned for privacy of information	1.9
Concerned about Hydro mismanagement, governance, wages	1.5
Issues or questions on survey itself	1.1
Had negative experience with WNH	0.7

WNH used both the qualitative and quantitative results to prepare the plan. Referring to **Table 2-7**, customers stated that overall, reliability and safety were their two highest priorities with cost being third; however, for those customers who felt that cost was important they rated it as very important.

Some areas where WNH wanted further clarification in the second phase included focus on innovation, renewables and generation, willingness to pay for underground services and customer service initiatives.

B) <u>Phase Two Engagement</u>

The second phase of consultation encompassed four core elements of customer engagement.

i) Online Survey: The online survey was promoted through social media, email blasts to customers for whom email addresses were available, as well as WNH's website. This survey was available to any WNH customer who wanted to participate.

ii) Random Telephone Surveys: Brickworks Communications conducted telephone surveys among Residential and General Service (GS<50 kW) customers to provide a generalizable assessment of WNH's system plan and rate implications. The telephone survey asked questions similar to those in the Online Survey. Customers were randomly selected by Brickworks Communications from a customer list provided by WNH. The outcome of the consultations resulted in findings on the needs and the preferences of WNH's Residential and General Service <50 kW customer base.

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

iv) Large Use Consultation Meeting: Senior team members from WNH met with representatives of its one Large Use customer. WNH's CEO presented its proposed capital and operating plans, its DSP and the rate implication for this rate class. WNH discussed specific implications and projects within the application that will impact the Large Use customer.

The online survey resulted in 2,393 completed responses and the telephone survey had 600 respondents. The online survey was completed between the days of November 14th and November 29th, 2019, whereas the telephone surveys were started on November 14th and were completed on November 24th, 2019.

The Mid-Market & Large Business Workshop held on November 28th 2019, resulted in 32 completed surveys which were completed in paper format and modified from the online version to eliminate questions that specifically related to residential customers and focused on areas of interest for business customers.

C) <u>Summary of Results and Highlights</u>

The summary and highlights completed by Brickworks Communications from these four elements are included here:

Results from both the online and telephone survey components reveal similar opinions with respect to most indicators, despite the extensive background information contained in the online survey in relation to the abridged text read in the telephone survey. For instance, findings from both surveys reveal a high level of understanding (somewhat & completely) of the role that Waterloo North Hydro plays in the electricity system, including where revenue comes from and what portion of their bill relates to WNH, including 98% of online and 97% of telephone respondents. However, more online participants said they were completely aware (53%) than telephone respondents (49%), while more phone customers said somewhat aware (48%) in relation to those online (45%). Among the 32 businesses that completed paper questionnaires, 18 said they were completely aware and 14 somewhat aware.

In a question only asked to the 32 businesses, 18 answered they somewhat and 14 very well understand the cost drivers that Waterloo North Hydro is responding to. Customers were presented with choosing among three options, including (a) service enhancements that they were told would increase costs, (b) having a lower priority on service while favoring lower cost alternatives and (c) continuing with current levels of customer service. Overall, the WNH client base prefers a continuation of current customer service levels, including 69% of telephone and a slightly lower 65% of online respondents. Next most named by 21% of telephone and 24% of online participants was decreasing costs with lower levels of customer service, while only 6% from both surveys want increased service (4% of phone and 6% of online participants were unsure).

As WNH currently exceeds regulated provincial standards in the area of answering calls

within 30 seconds, most customers do not want to see service levels decreased in order to save 15¢ per month or $1.80 per year. This includes two-thirds of telephone and 63% of online survey respondents. Only slightly more than a quarter or 26% of phone and 28% of online survey participants are willing to decrease service levels to lower costs; 7% and 9% respectively did not know or were unsure.

There is demand among customers for WNH to provide environmental alternatives and to focus on connecting or investing in renewable energy solutions or new technologies (at additional costs). Only 26% of telephone survey respondents want WNH to continue investing in traditional infrastructure, while a 65% majority from the phone poll want more money invested in renewables (26%), new technologies (6%) or both renewables and new technologies (33%) at additional costs. Ten percent did not know or were unsure. Among online participants there is a similar demand for investing in new technologies and renewables at additional costs – 64%. This includes 31% that want investment in both renewables and new technologies, 25% in renewables and 5% in new technologies. Only one-quarter want to continue investing in traditional infrastructure and 11% were unsure.

Among the 32 businesses, 18 want both investments in renewables and new technologies, six wanted more money in renewables, five wanted investments in new technologies, while only two said to continue investing in traditional infrastructure and one was unsure.

Despite the aforementioned demand for renewables and new technologies, a majority of customers are not willing to pay more for WNH to install more underground lines than they do today, if it means an increase in customer rates. Fifty-six percent of telephone respondents said they are not willing to pay more to increase the amount of underground distribution, while 26% are willing, but almost two in ten or 19% are undecided. Opposition was stronger among online participants as almost six in ten (59%) answered they would not be willing to pay more to increase underground lines, compared to one-quarter that are willing – 16% did not know.

Customers in both the online and telephone surveys rated their interest in ten improvements or upgrades, being told that there would be a cost impact associated with them.

Education rated highest, with more online participants favoring conservation than those by telephone safety. Automated outage notifications also rated highly, followed by an interactive website – with stronger results from the online component. Of mid-level importance was comparing consumption and automated alerts for usage, while results were lower for an online chat feature and alerts for bill due dates. Low importance was attached to automated alerts estimating bills and very low for extended office hours.

More customers responding to the online poll (75%) claimed to receive an e-bill than those to the telephone survey (38%). Fifteen of the 32 businesses receive an e-bill. After being told of the cost associated with traditional paper billing, they were asked what is preventing them from registering to receive an e-bill. The main mentions from telephone respondents related to not being aware of the cost savings (31%), closely followed by the perceived convenience of receiving a bill by mail (29%) and that a hard copy by mail serves as a reminder to pay (20%). Among online participants, most named was not being aware of the cost savings (31%), closely followed by the perceived convenience of receiving a bill by mail (26%) and that a hard copy by mail serves as a reminder to pay (20%). Among businesses, most named by five was not being aware of the cost savings, followed by three that responded convenience and three that it is a reminder to pay.

On the issue of tree trimming, customers support the status quo. Most (65% telephone & 63% online) back the current process of more frequent tree trimming with enough clearance to balance reliability, aesthetic, and environmental concerns. Twenty-four percent of telephone and 27% of online respondents want less frequent trimming, but more branches cut to ensure fewer outages or lower wait times to restore power, while only 4% (both surveys) want less trimming because of aesthetic or environmental reasons.

A) <u>System Renewal</u>

Slightly more than six in ten or 61% of telephone survey respondents feel the level of system renewal expenditures is just right to meet the objectives of safety, reliability and cost. Only 6% said it is too low, 11% too high, while 22% were unsure.

Among online participants, almost six in ten or 58% feel the level of expenditures is just right to meet the objectives of safety, reliability and cost. Only 5% said it is too low, 14% too high, while 23% were unsure.

Of the small businesses, 27 said the level is appropriate, three too low and two were unsure.

B) <u>System Service</u>

Among telephone respondents, 93% feel it is somewhat (46%) or very important (47%) to modernize the grid, compared to only 3% that feel it is unimportant – 4% did not know.

While a similar 92% of online participants said it is important to modernize, more answered very important (51%) compared to the telephone survey, while 41% answered somewhat important and 4% were unsure.

With respect to the GS > 50 kW businesses, 23 answered very important and nine somewhat important.

When asked to rank in order of priority preference five reliability outcomes, the highest scored was reducing the time to restore power during extreme weather, next by reducing outages during extreme weather, outages overall and then their overall length. Lowest scored was improving the quality of power, judged by momentary interruptions.

Among the 32 small businesses, reducing the overall number of outages ranked first, followed by the length of outages, the length of time to restore power during extreme weather, and the number of outages during extreme weather. Also scored lowest was improving the quality of power, judged by momentary interruptions.

C) <u>General Plant</u>

Two-thirds of customers responding to the phone survey feel the current level of expenditures is just right. Only 3% said too low, 10% too high, while two in ten were unsure. Sixty-five percent of online participants are of the opinion the level of general plant expenditures is just right, while 7% feel it is too low. Nine percent stated it is too high, while 19% were unsure. For businesses, 26 claimed it was appropriate, three too low and three did not know.

With respect to future capital expenditures, results show that 68% of telephone and 64% of online participants feel the overall level is just right, 7% phone (8% online) said it is too high, 7% too low (same for both), while 18% of phone and 21% of online respondents were unsure.

D) <u>Capital Investments</u>

For telephone respondents, 70% feel WNH has focused on the right areas for capital investments, only 3% do not. A significant 27% answered do not know. The number dips among online respondents as 64% feel WNH has focused on the right areas, while only 3% do not. However, more than three in ten or 32% answered do not know. Out of the 32 businesses, 28 stated WNH is focused on the right areas, while four were unsure.

When those that do not feel WNH is focused on the right areas or did not know were asked in a follow-up about what they think needs to be addressed, most were unsure (82% - phone & 86% online). Among those providing answers, most mentions related to renewables or environmental upgrades, equipment / general upgrades and lower prices.

After being read or presented with a background to rate increases, customers were then asked which of three statements best reflected their view on the topic. There is a sense that while rate increases are disliked they are necessary – 51% from the telephone and 53 % from the online survey hold this view. A core segment feel they are reasonable (32% telephone & 31% online), while few consider them unreasonable (13% telephone & 14% online) and the undecideds are low (4% telephone & 2% online). The same pattern held for businesses as 20 answered that while they don't like the idea, they are necessary, ten think them reasonable, only one said it is unreasonable and one was unsure.

Overall, there appears to be buy-in with the direction being taken by WNH as a strong majority including 84% of telephone and 83% of online participants feel WNH's investment plan is headed in the right direction. Results are even stronger on the perception among customers of how WNH is preparing for the future. Most of those responding by telephone or 88% said the utility is doing a good job in planning for the future as did 90% of online participants and all 32 businesses.

E) ***Large User Customer Consultation***

No formal documentation was prepared after the Large User Consultation Meeting however no issues were noted related to the rate increase specifically. The Large User customer representative was interested in the cost allocation methodology which was discussed at a high level and at a more detailed level in the final stages before filing submission.

F) ***Changes After Engagement***

After phase two of the customer consultation, WNH made adjustments to the capital expenditure plan. Please refer **Section 2.1.2** for a full discussion on the changes.

2.2.1.2. Municipal Government Consultations

WNH regularly consults with local municipal planning and economic development staff from the City of Waterloo, Township of Woolwich, Township of Wellesley and the Region of Waterloo. The purpose of the consultations is to share planning and development information that will aid in the timely, coordinated and cost effective delivery of services for both WNH and the municipalities. There are no final deliverables; this is an ongoing process of information exchange that informs WNH's current design and construction decisions or longer term system planning decisions. These consultations can be initiated by either party and vary in format and timing.

Some examples of these consultations are as follows;

a) With four municipal planning departments with which to interact, WNH receives on a weekly basis, development information to be reviewed and taken into consideration. A portion of these transmittals require WNH to respond with comment or action. Some develop into further discussions and meetings. These consultations have their greatest impact on current and following year investment plans.

b) On a monthly basis, WNH participates in the City of Waterloo Utilities Coordinating Committee. This is a standing committee that meets to discuss local development and includes other stakeholders such as the Region, Bell, Rogers, and Union Gas. These consultations have their greatest impact on current year investment plans.

c) Both the municipalities and WNH initiate ad hoc consultations normally regarding larger and longer term commercial and residential developments or relocations due to road alterations. These consultations can be as brief as one meeting or can last months to several years depending on the timing and scale of development. There may also be other participants such as customers, developers, and other agencies. Consultations with municipalities have helped shape System Access investments involving expansions and relocations for road works.

Without these ongoing consultations, WNH would always be in a reactionary state which would lead to inefficiencies and poor customer satisfaction. Consultations with municipalities have helped shape System Access investments involving expansions and road relocations projects in this DSP.

2.2.1.3. Development Community Consultations

a) On a quarterly basis, WNH participates in the City of Waterloo Home Builders Association meetings. Information on the direction of near and long-term development and growth trends is shared.

b) On an ad hoc basis during the normal course of business, WNH engineering staff consult with builders, developers and real estate companies. WNH uses these opportunities to gather information on the timing of near term developments and longer term trends. These consultations can be initiated by either party as the need arises.

c) On an annual basis WNH solicits information from the development community to feed into WNH's annual budget, long term load forecast and 5-year capital forecast. These consultations have an impact on near term investment plans.

Similar to the consultations with municipalities, there are no final deliverables; this is an ongoing process of information exchange that informs WNH's short term and long term System Access investment plans and ensure adequate resources are scheduled. Without them WNH would always be in a reactionary state which would lead to inefficiencies and poor customer satisfaction.

Consultations with developers have helped shape System Access investments involving residential subdivisions and multiunit apartment /condominium projects in this DSP.

2.2.1.4. Independent Electricity System Operator (IESO)

WNH has been undergoing long term consultations with the IESO in five areas:

- KWCG Integrated Regional Resources Plan (IRRP)
- Conservation and Demand Management (CDM)
- Wholesale Meter Services
- Ontario Power System Restoration
- Outage Planning

KWCG Integrated Regional Resources Plan (IRRP)

WNH has been a full and active member of the Kitchener-Waterloo-Cambridge-Guelph (KWCG) Region Study Team since its inception in 2010. The study team consists of Kitchener-Wilmot Hydro Inc.(KWHI), Energy+, Guelph Hydro Electric Systems Inc. (Alectra), HONI Distribution (HONI Dx), HONI Transmission (HONI Tx), and the Independent Electricity System Operator (IESO)

The first cycle of Regional Planning started in 2010 and concluded in 2015 with the publication of the Regional Infrastructure Plan (RIP) and the Integrated Regional Resources Plans (IRRP). Led by the IESO (formally the OPA), WNH participated in all meetings, discussions and alternatives development; and shared with stakeholders' information regarding WNH's distribution system capabilities and constraints, load forecasts, expansion and enhancement plans. The deliverables are in the form of final reports that can be found in **Appendix C**- KWCG IRRP Report (2015) and **Appendix D** - KWCG RIP Report (2015) of this DSP.

In 2018, WNH fully participated in the KWCG Region Needs Assessment Study Team. The "Assessment Report" was prepared for the purpose of identifying potential needs in the KWCG area; review and reaffirm needs/plans identified in the previous RIP; identify and assess system capacity, reliability, operation, and aging infrastructure needs; and also identify additional needs during the next phases of the planning process. The deliverable is in the form of a final report provided in **Appendix E** - KWCG Needs Assessment Report (2018) of this DSP.

Currently WNH is participating in the second cycle of regional planning which is underway for the Kitchener-Waterloo-Cambridge-Guelph (KWCG) Region. The IESO issued a KWCG IRRP Scoping Assessment Outcome Report in 2019 which can be found in **Appendix F** - KWCG IRRP Scoping Assessment Outcome Report (2019). The next IRRP for the region is anticipated to be completed in Q2 2020.

Hydro One's Regional Planning Status letter which provides further details for the KWCG Region is attached in **Appendix G** - KWCG Regional Planning Status Letter.

WNH's report on REG Investments and the Comment Letter from the IESO are included in **Appendix H** and **Appendix I** respectively.

Conservation and Demand Management (CDM)

Over the forecast period, WNH worked with the IESO to deliver CDM programs emanating from the 2015 to 2020 Conservation First Framework and Ontario's Long Term Energy Program (LTEP 2013). Annually the IESO would validate WNH's achievement toward its mandated goal. The deliverables from the IESO were the IESO's Verified Annual LDC CDM Program Results Report (the last one WNH received was for 2017) and Participant and Cost Reports for data up to April 2019.

On March 20, 2019, the Minister of Energy, Northern Development and Mines issued a directive cancelling the Conservation First Framework. WNH continues to work to close out projects by the end of 2020 and expects its projects to have delivered 90.8 GWh's or 110.2% of the 2020 target. Future consultations with the IESO on CDM related projects are unknown at this time. It is also unknown at this time if the IESO intends to issue any final report validating the achievement of WNH's CDM efforts.

Wholesale Meter Services

All of WNH's points of supply with HONI transmission, HONI distribution, Energy+ and Kitchener-Wilmot Hydro Inc. are registered with the IESO in the wholesale market. WNH is also registered with the IESO as a Wholesale Meter Service Provider. This results in various and frequent consultations with the IESO on matters of meter operations, maintenance and settlement in order to maintain wholesale meter operation and remain compliant with the IESO Wholesale Market Rules. These are ongoing consultations; there are no final deliverables.

Ontario Power System Restoration

As a registered Market Participant WNH works with the IESO and all other market participants to maintain a viable Ontario Power System Restoration Plan (OPSRP). The OPSRP provides a framework to ensure that the IESO and market participants can collectively recover Ontario's integrated power system and re-establish interconnected operation. Coordinated by the IESO, WNH participates along with all market participants in annual OPSRP reviews, updates, training and mock exercises to practice their roles and responsibilities. The IESO delivers an annual updated OPSRP report.

Outage Planning

On almost a daily basis, WNH and IESO operating staff work together to coordinate planned outages on transmission facilities. All grid connected LDC's and transmitters are required to isolate grid or grid-connected equipment for maintenance or repair. At times WNH is the requesting party and at other times it is HONI or other grid connected LDC's. All parties work with the IESO to coordinate activates so that work can proceed in a safe and efficient manner at minimal risk to the transmission system. These are ongoing consultations; there are no final deliverables.

2.2.1.5. Transmitter (HONI)

WNH owns and operates grid connected transformer stations supplied by Hydro One Networks (HONI) 115 kV and 230 kV transmission lines. HONI is WNH’s only transmitter. WNH regularly consults with HONI to share planning and operational information that will aid in the timely, coordinated and cost effective delivery of services for both parties. The value of the information may be immediate and considered in current design, construction or operational decisions or longer term to be used in system planning. These consultations can be initiated by either party and vary in format and timing.

Currently and through the forecast period, there are no transmission capacity constraints to deter new load or connections of Renewable Energy Generation. Most of WNH’s engagement with HONI will be over operational issues; especially supply point reliability.

Some examples of consultations with HONI are;

a) On a regular basis WNH operations and stations staff and their HONI counterparts communicate and coordinate over daily operations, planned and emergency maintenance. These communications can be initiated by either party, have their greatest impact on O&M and resulting actions are coordinated as much as possible to minimize equipment outage requirements. These are ongoing consultations; there are no final deliverables.

b) On an as needed basis, WNH senior engineering and operations staff initiate consultations with more senior HONI staff, mainly over supply point reliability concerns. Transmission reliability has been and will continue to be a concern over the forecast period. Deliverables from these consultations also come in the form of raising HONI’s awareness over transmission supply and reliability concerns and encouraging HONI to prioritize on reliability centric investments.

c) On an annual basis, senior staff from both organizations attend HONI’s Large Customer Conference. Both parties use this opportunity to share information, concerns and challenges on transmission supply and reliability issues. WNH takes from these meetings information to improve the development of WNH's mid and long term supply plans. There are no final deliverables from these consultations.

WNH consulted with HONI and other stakeholders for a midterm regional planning "Needs Assessment". The report was prepared for the purpose of identifying potential needs in the KWCG region; review and reaffirm needs/plans identified in the previous RIP; identify and assess system capacity, reliability, operation, and aging infrastructure needs; and also identify additional needs during the next phases of the planning process. The deliverable is in the form of a final report that can be found in **Appendix E** - KWCG Needs Assessment Report (2018).

2.2.1.6. Embedded Distributors

Hydro One Networks (HONI) is registered as an Embedded Distributor to WNH on the Elmira TS 33M2 feeder. WNH consulted with HONI regarding any forecast impacts by load or Renewable Energy Generation connections on the 33M2 feeder from Elmira TS. Hydro One responded by saying that each connection request will be assessed individually as per the established process between the two parties. WNH does not foresee any impacts from the Embedded Distributor on this DSP. No investments to support this Embedded Distributor have been included in this Application.

WNH also engaged HONI in a customer consultation regarding the development of the proposed embedded distributor rates. Hydro One has reviewed the material provided by WNH. Based on the cost allocation model and other evidence provided, HONI has communicated to WNH that it has no objections with the proposed cost allocation methodology used to develop the embedded distributor rates.

2.2.1.7. Host Distributors

WNH is embedded to three host distributors at <50 kV (Dx) at three points of supply listed in **Table 1-9**. On an ad hoc basis, WNH consults with Hydro One Distribution (HONI Dx), Kitchener-Wilmot Hydro Inc. (KWHI) and Energy+ on issues such as supply point reliability and capacity. These communications can be initiated by either party and their value is derived from sharing planning and development information that will aid in the timely, coordinated and cost effective delivery of services for both WNH and the host distributor. The value of the information may be immediate and considered in current design and construction decisions or longer term to be used in system planning. These consultations can be initiated by either party and vary in format and timing.

WNH and the host distributor counterparts also communicate and coordinate over daily operations, planned and emergency maintenance. These are ongoing consultations and there are no final deliverables.

2.2.2. (5.2.2b) Regional Planning Process Final Deliverables

- *… 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.*

WNH has been a full and active member of the Kitchener-Waterloo-Cambridge-Guelph (KWCG) Region Study Team since its inception in 2010. The first cycle of Regional Planning started in 2010 and concluded in 2015 with the publication of the Regional Infrastructure Plan (RIP) and the Integrated Regional Resources Plans (IRRP). WNH participated in all meetings, discussions and alternatives development, and shared with stakeholders, information regarding WNH's distribution system capabilities and constraints, load forecasts, expansion and enhancement plans. These final reports can be found in **Appendix C** and **Appendix D**.

In 2018 The KWCG Region Study Team published a "Needs Assessment Report". The report was prepared for the purpose of identifying potential needs in the KWCG area; review and reaffirm needs/plans identified in the previous RIP; identify and assess system capacity, reliability, operation, and aging infrastructure needs; and also identify additional needs during the next phases of the planning process. This final report is provided in **Appendix E**.

Currently WNH is participating in the second cycle of regional planning which is underway for the Kitchener-Waterloo-Cambridge-Guelph (KWCG) Region. The IESO issued a KWCG IRRP Scoping Assessment Outcome Report in 2019 which can be found in **Appendix F**. The next IRRP for the region is anticipated to be completed in Q2 2020.

Hydro One's Regional Planning Status letter which provides further details for the KWCG Region is attached in **Appendix G.**

WNH's report on REG Investments and the Comment Letter from the IESO are included in **Appendix H** and **Appendix I** respectively.

2.2.3. (5.2.2c) Relevant Material Documents provided to other Participants

- *in the process, for example forecast load at existing (and proposed, if any) points of interconnection.*

WNH's load forecast data at points of interconnection were shared with the IESO and all participants in the current cycle of Kitchener-Waterloo-Cambridge-Guelph (KWCG) Regional Planning process. The IRRP report is anticipated to be completed in Q2 2020.

- *Forecast renewable generation connections and any planned network investments to accommodate the connections.*

This information is provided in WNH's REGI Plan 2019. A copy can be found in **Appendix H**.

- *Investments involving grid modernization equipment and/or systems that could have an impact on the operation of assets serving the regionally interconnected utilities.*

There are no grid investments that would have an impact on the regionally interconnected utilities.

- *The results of projects or programs involving the study or demonstration of innovative processes, services, business models, or technologies, and on the projects or programs of this nature planned by the distributor over the forecast period.*

There are no results of projects or programs involving the study or demonstration of innovative processes.

2.2.4. (5.2.2d) REG investments IESO Comment Letter

- *… in relation to REG investments included in the distributor's DSP, along with any written response to the letter from the distributor.*

WNH has consulted with the IESO regarding its Renewable Energy Generation Investments (REGI) Plan. The REGI Plan and the IESO's letter of comment can be found in **Appendix H** & **Appendix I** respectively.

Based on the IESO's evaluation and response to WNH's REGI Plan, there is no need for WNH to respond to the IESO. There is also no need for WNH to co-ordinate with other distributors and/or transmitters or others on implementing the REG Investments plan.

WNH REG Investments are not a part of any Regional Infrastructure Plan.

2.3. (5.2.3) Performance Measurement for Continuous Improvement

WNH evaluates its performance through measures that are aligned with and support the achievement of the four key OEB performance outcomes as established in the Renewed Regulatory Framework for Electricity (RRFE) namely: Customer Focus, Operational Effectiveness, Public Policy Responsiveness and Financial Performance. The measures are also aligned with and support WNH's Corporate Mission, Vision, Values and Strategic Imperatives as noted in **Section 1.3.2**.

This section presents measures contained in the OEB Electricity Utility Scorecard, WNH's Corporate Scorecard and additional performance measures used to monitor the efficiency and effectiveness of WNH's operational and capital programs.

All measures presented in this section are regularly reviewed by senior management and provide feedback as to the effectiveness of WNH's plans in achieving these outcomes. WNH considers both the absolute value of the measure and any significant trend in evaluating its own performance.

Referring to **Section 3.1.2.3**, and **Figure 3-1**, reliability and performance targets feed into WNH's asset management and capital expenditure planning processes. Performance categories that do not meet minimal performance thresholds are flagged for action to bring the performance back into compliance.

WNH also looks for opportunities to improve the asset management and capital expenditure planning process itself in order to achieve better outcomes. Recent examples include; a more detailed and disciplined asset data collection process to improve data quality; Improved reporting to support better and more timely analytics, and introduction of risk based asset management software to improve asset health analytics and prioritization of capital expenditures.

2.3.1. WNH Corporate Scorecard Performance Measures

Methods and Measures (5.2.3 a & d)

Tables 2-9a, 2-9b and **2-9c** present measures contained in WNH's Corporate Scorecard along with a record of performance from 2016 to 2019. In addition to senior management review, these performance measures are also presented and reviewed quarterly at WNH Board of Directors meetings.

There are three areas where performance did not meet the minimum target. An explanation for each is provided including remedial action taken.

Table 2-9a: WNH Performance Measures

Performance Outcomes	Performance Categories	Drivers	Measures	OEB Target	WNH Target	2016 Actual	2017 Actual	2018 Actual	2019 Actual
Customer Focus *Services are provided in a manner that responds to identified customer preferences*	Service Quality	Regulatory / Customer	New residential services connected on time	90%	90%	100%	100%	100%	100%
			Scheduled appointments met on time	90%	90%	99.9%	99.7%	99.9%	84.2%
			Telephone calls answered on time	65% (within 30 seconds)	90% (within 30 seconds)	90.8%	75.7%	92.7%	90.7%
	Customer Satisfaction	Customer	First contact resolution	Determined by the Utility	> 95%	99.92%	99.90%	99.87%	99.82%
			Billing accuracy	98%	< 1 cancelled bill per 1,000 bills produced (99.9%)	99.73%	99.97%	99.97%	99.89%
			Customer satisfaction survey results	N/A	Min. 90.0% of customers satisfied	92.0% in 2016	92.0% in 2016	96% in 2018	96% in 2018

1) 2019 Service Quality – WNH did not meet the OEB target of 90% for all scheduled appointments met. This was due to locate services changing over from WNH internal staff to outsourcing with a private contractor. The Contractor was unable to keep up with the demand of requests within the desired timeframe. WNH has worked with the contractor to bring the performance into compliance. The issue has since been rectified and WNH does not expect a reoccurrence.

Table 2-9b: WNH Performance Measures

Performance Outcomes	Performance Categories	Drivers	Measures	OEB Target	WNH Target	2016 Actual	2017 Actual	2018 Actual	2019 Actual
Operational Effectiveness *Continuous improvement in productivity and cost performance is achieved, and distributors deliver on system reliability and quality objectives*	Safety	Regulatory / Corporate / Customer	Public awareness	N/A	80%	2016 - 82%	2017 - 82%	2017 - 82%	2019 - 82%
			Annual number of serious electrical incidents (numbers are in the year of occurrence)	1	0	1	6 (2) See Section 2.3.3.1 for clarification	1	1
			Level of compliance with Ontario Regulation 22/04	Compliant	Compliant	Compliant	Compliant	Compliant	Compliant
			Accident frequency per 200,000 hours worked	N/A	0	0	0	0	0
	System Reliability	Regulatory / Corporate	Customer hours of interruption (SAIDI)	0.62	0.62	0.71	0.76	0.92	0.85
			Average number of times that power to a customer is interrupted (SAIFI)	1.13	1.13	1.15	1.50	1.32	1.29
	System Efficiency	Regulatory / Customer	Distribution system loss (%)	< 5%	< 4%	3.42%	3.09%	3.32%	3.01%
	Asset Management	Regulatory / Corporate	Distribution system plan implementation progress (over the forecast period)	N/A	100%	23.05%	41.81%	61.36%	82.07%
			Percentage of OEB mandated inspections completed	100%	100%	100%	100%	100%	100%
			Percentage of scheduled maintenance completed	100%	100%	100%	100%	100%	100%
	Employees	Corporate	Employee engagement Index (every three years)	N/A	>80%	2016 - 86.0%	2016 - 86.0%	2018 - 80.0%	2018 - 80.0%
			Employee Attendance # of days absent	N/A	< 4.0	3.29	3.63	4.29	3.18
			Percentage of training & development	N/A	4.0%	5.3%	4.5%	4.0%	4.4%
			Percentage of succession plans in place for key management positions	N/A	100%	100.0%	100.0%	100.0%	100.0%

2) System Reliability - WNH has not met its performance target with respect to SAIDI and SAIFI. WNH has and continues to focus a portion of its asset inspection programs and capital expenditures to bring its system reliability inline with OEB targets. Specifically, WNH's introduction of FLISR and increased number of remotely controlled switching devices in the field have started to yield results. More detailed information can be found in **Section 2.3.3.2** and **Appendix K** – Distribution System Reliability Report.

Table 2-9c: WNH Performance Measures

Performance Outcomes	Performance Categories	Drivers	Measures	OEB Target	WNH Target	2016 Actual	2017 Actual	2018 Actual	2019 Actual
Public Responsiveness *deliver on obligations mandated by regulation and code (e.g., legislation and regulatory requirements imposed further to Ministerial directives to the OEB)*	Regulatory	Regulatory	Percentage of regulatory filings completed on schedule	100%	100%	100%	100%	100%	100%
			Completion of scheduled rate filings	100%	100%	100%	100%	100%	100%
	Conservation & Demand Management	Regulatory / Customer	Net cumulative energy savings (percent of target achieved)	82.38 GWh (6 year target)	82.38 GWh (6 year target)	28.73 GWh 34.9%	43.10 GWh 52.3%	72.41 GWh 87.9%	87.49 GWh (106.2%)
	Connection of Renewable Generation	Regulatory / Customer	Renewable generation connection impact assessments completed on time	90%	100%	80.0%	100%	100%	100%
			New micro-embedded generation facilities connected on time	90%	100%	100%	100%	100%	100%
Financial Performance *Financial viability is maintained: savings from operational effectiveness are sustainable*	Cost Control	Corporate	Efficiency assessment	3	3	3	3	3	3
			Preventable losses as a percentage of revenues	N/A	< 0.5%	0.00%	0.08%	0.04%	0.06%
			Controllable costs per customer	Annual Increase GDP IPI [FDD] - 0.3% Productivity Factor	Annual Increase CPI - 0.3% Productivity Factor	$239.25	$240.14	$263.17	$258.95
			Controllable costs per MWh	Annual Increase GDP IPI [FDD] - 0.3% Productivity Factor	Annual Increase CPI - 0.3% Productivity Factor	$9.02	$9.41	$10.00	$10.11
	Financial Ratios	Corporate	Liquidity: current ratio (current assets/current liabilities)	N/A	1.0 to 1.25	1.33	1.41	1.38	1.20
			Leverage: total debt (includes short term and long term debt) to equity ratio	<= 60% Debt	< 57% Debt	54.3%	53.7%	53.1%	52.4%
			Profitability: return on equity (Corporate ROE)	8.52% +/- 3%	8.52% +/- 3%	9.5%	8.04%	8.01%	7.93%

3) 2016 Connection of Renewable Generation, Connection Impact Assessment - WNH did not meet the OEB target of 90%. Electricity distributors are required to conduct Connection Impact Assessments (CIAs) within 60 days of receiving authorization from the IESO. WNH completed four of five CIAs within the prescribed time limit for a rate of 80.0%. The one exception was a result of miscommunication involving an agreement with another distributor. WNH modified its procedures and improved its monitoring. This situation has not reoccurred.

2.3.2. Customer Focused Performance

2.3.2.1. Service Quality

Methods and Measures (5.2.3a)

Service Quality measures includes the following: New Residential/Small Business Services Connected on Time, Scheduled Appointments Met-On-Time and Telephone Calls Answered on Time. WNH monitors these measures monthly and takes action if any indicator falls below target. WNH also reports these measures as part of its RRR filings.

Historical Performance (5.2.3c)

Table 2-10: Service Quality - Historical Performance

Measure	Driver	Target	2016	2017	2018	2019	2016-2019 AVG.
New Residential / Small Business Services Connected on Time	Regulatory	90%	100%	100%	100%	100%	100%
Scheduled Appointments Met on Time	Regulatory	90%	100%	100%	100%	84%	95.9%
Telephone Calls Answered on Time	Regulatory	65%	90.8%	75.7%	92.7%	90.7%	87.5%

Table 2-10 illustrates WNH's record of exceeding targets in these areas. WNH expects that trend to continue through the forecast years.

How Historical Performance has affected the DSP (5.2.3d)

There are no changes forecast in the DSP due to the historical performance of these indicators.

2.3.2.2. Customer Satisfaction

Customer satisfaction measures includes the following First Contact Resolution, Billing Accuracy and Customer Satisfaction Survey Results. WNH monitors these measures monthly and takes action if any indicator falls below target. WNH also reports these measures as part of its RRR filings. **Table 2-11** illustrates WNH's record of exceeding targets in these areas.

Historical Performance (5.2.3c)

Table 2-11: Service Quality - Historical Performance

Measure	Driver	Target	2016	2017	2018	2019	2016-2019 AVG.
First Contact Resolution	Corporate	90%	99.92%	99.90%	99.87%	99.82%	99.88%
Billing Accuracy	Corporate	98%	99.73%	99.97%	99.97%	99.89%	99.89%
Customer Satisfaction Survey Results	Corporate	90%	92.0% in 2016	92.0% in 2016	96.0% in 2018	96.0% in 2018	94.0%

How Historical Performance has affected the DSP (5.2.3d)

There are no changes forecast in the DSP due to the historical performance of these indicators.

2.3.2.3. Conservation & Demand Management

Methods and Measures (5.2.3a)

WNH has been offering Conservation and Demand Management (CDM) programs since 2011. Engagement and consultation with stakeholders including the IESO, customers, trade allies, associations, government and non-government organizations have occurred frequently and on an ongoing basis as part of engagement, promotion, and delivery of the CDM programs. WNH closely monitors and reports on Net Cumulative Energy Savings to ensure targets are met.

On March 20, 2019, the Minister of Energy, Northern Development and Mines issued a directive cancelling the Conservation First Framework. WNH continues to work with its customers to close out projects by the end of 2020 under the wind down plan approved by the IESO.

Under the 2015 to 2020 Conservation First Framework, Waterloo North Hydro (WNH) was allocated 82.38 GWh's of energy savings. Through the engagement of WNHs customers in energy efficiency programs, by the midpoint of the framework, WNH had achieved 55.98 GWh's or 68.0% of the target. By the end of 2018 WNH had achieved 72.41 GWh's or 87.9% of the target, and WNH projects to achieve 90.76 GWh's or 110.2% of the target by the end of 2020. WNH energy efficiency savings will persist at an annual rate of 99% over the forecast period.

How Historical Performance has affected the DSP (5.2.3d)

Conservation and Demand Management programs have had an impact of reducing WNH's kW demand and kWh energy sales. There are no rate-funded CDM programs in this DSP for the 2021 – 2025 forecast period.

2.3.2.4. Connection of Renewable Energy Generation

Please refer to the following sections for more detailed information of REG.

- **Section 1.3.9** of this DSP
- **Appendix H –** Renewable Energy Generation (REG) Investment Plan

Methods and Measures (5.2.3a)

WNH uses two measures which it also reports to the OEB.

- Renewable Generation Connection Impact Assessments Completed on Time
- New Micro-Embedded Generation Facilities Connected on Time

Historical Performance (5.2.3c)

Table 2-12: Connection of REG Performance

Year	REG CIA's Completed on Time	New Micro FIT Connected on Time
2016	80%	100%
2017	100%	100%
2018	100%	100%

How Historical Performance has affected the DSP (5.2.3d)

The connection of REG has not materially impacted this DSP.

2.3.3. Asset and/or System Operations Performance

2.3.3.1. Safety

Methods and Measures (5.2.3a)

Maintaining a high level of public and worker safety are key components of WNH's corporate values and strategic imperatives. Both are monitored on an ongoing basis. All incidents and accidents are reported to the President & CEO and the Senior Executive Team. WNH's Safety record is reported to the WNH Board at every meeting.

Safety related measures used by WNH to monitor its operations performance are illustrated in **Table 2-13**.

Historical Performance (5.2.3c)

Table 2-13: WNH Safety Measures - Historical Performance

Measure	Driver	Target	2016*	2017*	2018*	2019*	2016-2019 AVG.
Level of Public Awareness	Regulatory	90.0%	82.0% 2016	82.0% 2017	82.0% 2017	82.0% 2019	82.0%
Number of Serious Incidents	Corporate	1	1	1	6 (3)	1	2.3 (1.5)
Compliance to Ontario Reg. 22/04, Component B	Regulatory	C	C	C	C	C	C
Accident frequency per 200,000 hours worked	Corporate	0	0	0	0	0	0.0%
Incident Rate per 1,000 km of line (Target)	Regulatory	Target	0.450	0.356	0.351	0.772	48.2%
Incident Rate per 1,000 km of line (Performance)	Regulatory	See line above	0.618	0.618	3.645 (1.22)	0.605	61.4%
Lost Time Injuries	Corporate	0%	0	0	0	0	0.0%
Non Lost Time Injuries	Corporate	0%	4	3	0	0	1.75
Group 835 LTI (average)	Corporate	0	0.6	0.62	0.56	0.61	0.60

* Note: Years listed in **Table 2-13** refer to the years listed in the OEB scorecard. The incidents occurred in the prior year.

WNH has been averaging one Serious Electrical Incident (SEI) per year over the historical period with the exception of 2017 (2018 OEB score card) when the number of serious electrical incidents rose to (6). The Electrical Safety Authority's (ESA) criteria at the time included motor vehicle accidents and other incidents beyond the control of the LDC. Of the six incidents, three were beyond the control of WNH; two of these were as a result of motor vehicle accidents hitting a pole and a transformer and the third was a customer owned overhead conductor that failed. Of the three within the control of WNH, two were the result of #4 and #6 ACSR primary overhead conductors failing and falling to the ground. The conductor failure was as a result of age and metal fatigue. Repairs were made and both lines involving these incidents were rebuilt in 2019. The third incident was the result of a failed connection which caused an un-energized neutral conductor to fall to the ground. The connector and conductor were repaired.

Based on ESA's new criteria which came into effect in 2018, the 2017 score would have been three.

WNH's Electrical Safety Community Outreach Program is the main vehicle by which WNH promotes and delivers public safety messaging to the community it serves. This program has a variety of facets, the main ones being:

- elementary school safety program;
- children's day camps and boy scout meetings;
- local summer camps and safety farm days;
- electrical awareness program for first responders;
- contractor electrical safety program;
- additional Public Engagement including bill inserts, print ads, social media, WNH website and radio.

WNH also partners with a number of organizations to provide cost effective and quality programs including, KWHI, Energy+, Alectra, ESA, IHSA, MOL, TSSA and others.

Table 2-14 provides a summary of the main activities that WNH tracks.

Table 2-14: WNH Public Safety Activities

Activities	2016	2017	2018	2019	Comments
Safety demonstrations given to schools	135	145	143	164	Electrical Safety Presentations provided by request. Over 3,000 children participated. 2018 & 2019 Safety Poster Contest started.
First responders	9	8	0	2	Electrical Safety Presentations provided by request 2016 Presented to Waterloo Regional Police Services 2017 & 2019: Presented to Waterloo Regional Fire Fighters
Any other group	1	4	5	3	Electrical Safety Presentations given to other groups, including 200 participants per year at Farm Safety Events. Presentations at Woolwich Emergency Preparedness Open house with 160 participants per year.
Safety awareness events hosted or sponsored by WNH	1	1	1	1	Contractor Safety Event in 2016 & 2018. Joint Utility Safety Meeting in 2017 & 2019. Both events are a combined effort with other local utilities.

How Historical Performance has affected the DSP (5.2.3d)

Prior to the 2017 incidents WNH did have a program to rebuild lines with failing # 4 & # 6 ACSR conductor with an annual capital investment of approximately $255,000. After the 2017 incidents, WNH increased its inspection and System Renewal investments targeted at these conductors. In 2021 WNH will be investing $850,000 in this program.

2.3.3.2. System Reliability

This section provides a high level overview of the WNH's System Reliability. More detail information can be found in **Appendix K** – Distribution System Reliability Report.

Methods and Measures (5.2.3a)

WNH monitors distribution system reliability on a close and continuous basis. WNH considers quantitative metrics such as System Average Interruption Duration Index ("SAIDI"), System Average Interruption Frequency Index ("SAIFI"), and Customer Average Interruption Duration Index ("CAIDI") as well as more qualitative feedback from customer consultations in its operations, maintenance and capital plans. Although not specifically a performance metric in the OEB score card, WNH also monitors and considers Momentary Average Interruption Frequency Index (MAIFI) and Customer Minutes of Interruption Saved (CMIS) as part of its overall focus on reliability.

Events impacting reliability are recorded, analyzed by cause and geospatially referenced to identify patterns in frequency and location of events. Reliability events are symbol-coded by cause and colour coded by year for better recognition of clusters and patterns over time. Annual performance is analyzed and recommendations for action are developed and considered for either more immediate O&M action or longer term planned capital investments.

Annually WNH produces a Distribution System Reliability Report on distribution reliability performance. This report captures distribution system outage details including sustained and momentary interruptions by feeder, cause code and location. Metrics are in place to identify worst performing feeders which aids in the prioritization of maintenance and capital improvement investments. Supplementary maps are included to illustrate root cause clustering and trending. The full report is provided in **Appendix K**. At a summary level, the Report provides information on the following;

- Customer Sustained Interruption minutes by year and by cause code
- Major events

- Normalized Comparisons
- Top Contributing Events
- Cause Code Observations with spatial trending maps
- Momentary Interruptions
- Historical Comparisons
- Top Contributing (worst performing) Feeders
- Annual Reliability Indices
- Summary of Recommendations and status

WNH analyzes its reliability indices with and without the inclusion of Major Event Days (MED) data and with or without Loss of Supply (LOS). This allows WNH to separately identify chronic and acute reliability concerns as often they have different drivers and solutions.

Historical Performance (5.2.3c)

Table 2-15 provides the results of WNH's 2016-2019 reliability performance including all interruptions.

Table 2-15: WNH Historical Customer Outage Minutes (All Inclusive)

Date	CMI	SAIDI	SAIFI	CAIDI	MAIFI
2016	9,577,516	2.87	2.99	0.96	8.16
2017	2,928,893	0.86	1.61	0.54	4.02
2018	7,161,955	2.09	1.86	1.12	4.79
2019	3,891,102	1.13	1.84	0.61	3.19
Average	5,889,867	1.74	2.08	0.81	5.04

Table 2-16 provides the results of WNH's 2015-2019 reliability performance exclusive of Loss of Supply and Major Event Days.

Table 2-16: WNH Historical Customer Outage Minutes (Excluding LOS & MED)

Date	CMI	SAIDI	SAIFI	CAIDI	MAIFI
2016	2,361,038	0.71	1.15	0.62	8.16
2017	2,583,472	0.76	1.50	0.51	4.02
2018	3,156,156	0.92	1.32	0.70	4.79
2019	2,936,432	0.85	1.29	0.66	3.19
Average	2,759,274	0.81	1.31	0.62	5.04

Although not an OEB Target, WNH monitors its momentary interruption performance (MAIFI) due to its impact on customers. From **Table 2-15**, it can be observed that MAIFI has been reduced substantially over the historical period. WNH believes this is a result of the grid modernization investments made in distribution reclosers.

WNH's reliability targets for 2016 - 2020 SAIDI and SAIFI are presented in **Table 2-17**. These targets were set in 2016 and based on WNH's 2011- 2015 reliability performance. In addition, WNH set range targets for SAIDI and SAIFI to be no more than that of the previous 2011-2015 period; SAIDI (0.47-0.75) and SAIFI (0.85-1.59).

Table 2-17: WNH Reliability Performance

	OEB TARGET	DEAD BAND RANGE	
Exclusive of Supply and MEDs	2016 - 2020	MIN	MAX
SAIDI (Duration)	0.62	0.47	0.75
SAIFI (Frequency)	1.16	0.85	1.59

Comparing WNH's performance results in **Table 2-16** to the targets in **Table 2-17,** it can be observed that WNH's reliability performance did not meet the OEB targets for SAIDI and SAIFI.

Analysis of the results suggests the following;

1) WNH’s outage management system (OMS) went into service in 2015. This technology has improved the accuracy of recording of both customers and interruption minutes over the historical period. WNH suspects that this has also worsened its baseline reliability performance measures.

2) The implementation of grid modernization technology by WNH has saved approximately 1.64 million customer outage minutes annually. This has also had the effect, in some outage events, to reduce the customer outage minutes below the major event day (MED) threshold. Where in the past, the entire outage minutes for such an event would have fallen under a MED event and not contributed to the performance record, the customer outage minutes are now reduced and add to the performance record. WNH suspects that this has also worsened its baseline reliability performance measures.

3) WNH has made a conscious decision to increase the number of line safety patrols prior to restoring power during an outage with an unknown cause. This was as a result of safety concerns where incidents of motor vehicle accidents or damaged equipment created situations where the public could have come in contact with energized conductors. The patrols increase public safety; however, they also result in longer outage durations. This change in operating practice has also worsened WNH’s baseline reliability performance measures.

How Historical Performance has affected the DSP (5.2.3d)

Referring to **Table 2-7**, Customer Engagement results pointed to reliability as foremost in the minds of WNH Customers. WNH is concerned about its reliability performance and its impact on customers. WNH is proposing investments included in this DSP specifically targeted at meeting customer expectations OEB reliability targets.

Over the forecast period WNH will invest in automated switching devices and electronic fault indicators to enhance the capabilities of other grid modernization technologies such as OMS and FLISR. WNH has averaged over 1.64 million CMIS annually since 2016 and achieved 1.7 million CMIS in 2019. These savings only occurred on the sections of the distribution system enabled with these technologies. Investments in grid modernization over the forecast years will allow WNH to expand the use of these technologies further into the distribution system allowing a greater number of customers to benefit.

2.3.3.3. System Losses

Historical Performance (5.2.3c)

WNH reviews its distribution system losses regularly and under the OEB's Reporting and Record Keeping Requirements (RRR), reports its actual distribution losses annually.

WNH's loss factor has been ranging between 3.2% – 3.6%, well below the OEB's recommended threshold of 5% as set out in the OEB's document "Ontario Electricity Distributor Practices Relating to Management of System Losses (June 23, 2008)". WNH's loss factor is also consistently at or below the Ontario average. The results can be found in the annual OEB Yearbook of Ontario Electricity Distributors (Yearbook). Please refer to **Section 1.3.6** of this DSP for more detailed information.

How Historical Performance has affected the DSP (5.2.3d)

WNH's System losses are already below the provincial average. There are no specific loss reduction investments being made for the forecast period, however this measure will benefit marginally as a result of System Renewal investments. Loss reduction has not materially impacted this DSP.

2.3.3.4. Asset Management

Methods and Measures (5.2.3a)

WNH utilizes the three measures listed in **Table 2-18** to track asset management activities.

Annually WNH performs a capital investment planning exercise to set the work program and expenditure plan for the upcoming year. The exercise takes into account WNH's five-year plan as well as developments that occurred over the previous 12 months that need to be considered. WNH's plan is adjusted to needs current at the time and may vary substantially from the plan filed with the OEB.

Requirements of the OEB's Distribution System Code (DSC) outline the minimum inspection standards and intervals required. Specifically, Table C-1 of the DSC identifies the maximum intervals, in years, for visual patrols, which for most urban facilities is 3 years, rural facilities is 6 years and stations is 1 month. WNH ensures that all OEB prescribed inspections are completed annually.

Historical Performance (5.2.3c)

Table 2-18: Asset Management Measures

Performance Categories	Drivers	Measures	OEB Target	WNH Target	2016 Actual	2017 Actual	2018 Actual	2019 Actual
Asset Management	Regulatory / Corporate	Distribution system plan implementation progress (over the forecast period)	N/A	100%	23.05%	41.81%	61.36%	82.07%
		Percentage of OEB mandated inspections completed	100%	100%	100%	100%	100%	100%
		Percentage of scheduled maintenance completed	100%	100%	100%	100%	100%	100%

WNH targets to complete its annual plan and achieve 100% of its 5-year plan by the end of 2020.

How Historical Performance has affected the DSP (5.2.3d)

To support WNH's Asset Management Plan and provide improved forecasting of capital expenditures, asset inspections and asset condition analysis have become more detailed. This will place upward pressure on O&M costs over the forecast period.

2.3.3.5. Employees

Methods and Measures (5.2.3a)

WNH tracks the measures in **Table 2-19** as part of its corporate governance.

High employee engagement is a measure of the employee's satisfaction with the company, their position and the work that they perform. Engaged employees are more likely to perform at a higher level, contribute more, remain with the company longer and provide better customer service.

Poor employee attendance negatively impacts operations and administration costs.

WNH's investment in training is made to facilitate a safer, more knowledgeable, skilled, efficient and effective workforce.

WNH senior management develop and review succession plans on a regular basis. This is a risk mitigation measure intended to facilitate business continuity in the event of loss of staff.

Historical Performance (5.2.3c)

Table 2-19: WNH Employee Measures

Performance Categories	Drivers	Measures	OEB Target	WNH Target	2016 Actual	2017 Actual	2018 Actual	2019 Actual
Employees	Corporate	Employee engagement Index (every three years)	N/A	>80%	86.0%	86.0%	80.0%	80.0%
		Employee Attendance # of days absent	N/A	< 4.0	3.29	3.63	4.29	3.18
		Percentage of training & development	N/A	4.0%	5.3%	4.5%	4.0%	4.4%
		Percentage of succession plans in place for key management positions	N/A	100%	100%	100%	100%	100%

How Historical Performance has affected the DSP (5.2.3d)

WNH will continue to track these measures so as to minimize their impact on OM&A costs. There are no changes to the DSP as a result of their historical performance.

A) Operational Staffing Levels

This section provides a high level overview of WNH's staffing levels both historical and Forecast from 2016 – 2021. More detailed information on staffing can be found in this application's **Exhibit 4, Section 2.4.3.1** WORKFORCE PLANNING AND EMPLOYEE COMPENSATION.

Methods and Measures (5.2.3a)

WNH measures and monitors staffing levels and staff turnover rates because of their impact on operational performance and OM&A costs.

WNH has been frustrated for some time in its ability to hire the necessary fully qualified and experienced trades and technical staff. For this reason, WNH generally hires into training positions and develops its own staff. WNH hires approximately 3 years in advance of impending retirements of trades and technical staff in order to train and provide experience to new staff before existing staff leave. The continuity and transfer of knowledge does not entirely make up for the skills deficit WNH experiences when staff retires; however, it does leave WNH in a position to still carry on effective operations.

As a means of supporting this recruitment program, WNH hires co-op apprentice power line maintainers and co-op technical/engineering students for each 4-month term. These opportunities provide apprentices and engineering students with valuable work experience, return value to WNH for the work they perform and provides WNH an opportunity to evaluate them as potential future employees. Those that are not recruited for permanent positions at WNH, leave having been introduced to the industry and with valuable work experience. Many have gone on to fill roles at other utilities in the industry. WNH has found its recruitment program to be highly successful and directly aligned with WNH's Strategic Imperatives (Employee Relations and Development, Organizational Effectiveness).

WNH utilizes a mixture of permanent staff, part-time staff and contract services to execute its investment plans in a cost effective manner. WNH maintains staffing levels to perform most of the O&M work; approximately 75% of annual capital overhead construction and approximately 95% of all capital engineering work. In underground capital construction 100% of the civil work and 80% of the electrical installation is completed by contracted services. In stations, nearly 100% of all O&M is performed by WNH staff. Staffing levels must also allow for on-call response work for emergency and inclement weather. Overall, contracted services are utilized where they can be most effective in both cost and execution of work.

Historical Performance (5.2.3c)

WNH staffing measures are provided in **Tables 2-20** and **Table 2-21**. WNH staffing levels decreased since 2016 as people have retired or left the organization. The reduction was due in part to positions that already had succession staff in place and in part due to positions that became vacant and were not refilled.

In 2021, staffing levels are forecast to increase over 2020, due to: the hiring of replacement (succession) staff to prepare for upcoming retirements; the addition of an Asset Management Position in the engineering department; the addition of two new Key Account representatives and one Corporate Communications Specialist.

Table 2-20: WNH Historical Staffing Levels

Measure	2016 COS	2016 Actual	2017	2018	2019	2020	2021	2021 vs 2016 COS
Full Time	123.9	121.0	117.9	112.4	111.5	115.3	121.0	-2.9
Students/Contract	8.3	8.6	7.1	11.3	10.5	7.1	7.4	-0.9
Total	132.1	129.6	125.1	123.8	122.0	122.4	128.4	-3.7

Between 2016 and 2019, WNH experienced a staff turnover of 8 to 13 FTEs annually, or an annual rate of 8% – 10%. Approximately 45% of the turnover was due to retirements with the other 55% leaving the organization for other opportunities.

Table 2-21: WNH Historical Staff Turnover

Measure	2016	2017	2018	2019	Ave
Retirements	6	5	4	6	5.3
Resignations	6	7	6	7	6.5
Total	12	12	10	13	11.8
FTE's	129.6	125.1	122.8	122.0	124.9
% Retirements	4.6%	4.0%	3.3%	4.9%	4.2%
% Resignations	4.6%	5.6%	4.9%	5.7%	5.2%
% Staff Turnover	9.3%	9.6%	8.1%	10.7%	9.4%

Table 2-22: WNH Forecast Retirements

Measure	2020	2021	2022	2023	2024	2025	AVE
Forecast Retirements	10.0	0.00	4.0	2.0	2.0	2.0	3.3

Table 2-22 illustrates the number of WNH employees eligible to retire between 2020 and 2025. The rate of retirements during this period are forecast to be below that of the historical period.

How Historical Performance has affected the DSP (5.2.3d)

Depending on the position, training periods for new staff are normally 1 to 3 years ahead of impending retirements. This increases the number of FTEs and associated administration costs. In addition to the costs of directly refilling a vacated position, additional costs are generated as internal staff look for opportunities in the vacated position. In a domino effect, there may be several staff to train for every employee that leaves the company.

Both the historical and forecast OM&A expenditures reflect these added expenses.

2.3.4. Public Policy Responsiveness

WNH has a clear and consistent record in complying with all obligations and requirements in fulfilling its role as a Local Distribution Company in the Province of Ontario.

2.3.4.1. Regulatory

Methods and Measures (5.2.3a)

WNH measures are presented in **Table 2-23**.

Historical Performance (5.2.3c)

Table 2-23: Public Responsiveness

Measures	OEB Target	WNH Target	2016 Actual	2017 Actual	2018 Actual	2019 Actual
Percentage of regulatory filings completed on schedule	100%	100%	100%	100%	100%	100%
Completion of scheduled rate filings	100%	100%	100%	100%	100%	100%

How Historical Performance has affected the DSP (5.2.3d)

This measure has not materially impacted this DSP.

2.3.5. Cost Efficiency and Effectiveness

- *Cost Efficiency & Effectiveness with Respect to Planning Quality and DS Plan Implementation.*

2.3.5.1. Cost Control

Methods and Measures (5.2.3a)

The total costs for Ontario's local electricity distribution companies are evaluated by the OEB to produce a single efficiency ranking. The electricity distributors are divided into five groups based on the magnitude of the difference between their respective actual and predicted costs. WNH also utilizes Controllable Cost per Customer and Controllable Cost per MWh as measures to better understand its performance.

Historical Performance (5.2.3c)

Table 2-24: Historical OEB Efficiency Assessment

Measures	OEB Target	WNH Target	2016 Actual	2017 Actual	2018 Actual	2019 Actual
Efficiency Assessment	3	3	3	3	3	3
Controllable costs per customer	Annual Increase GDP IPI [FDD] - 0.3% Productivity Factor	Annual Increase CPI - 0.3% Productivity Factor	$239.25	$240.14	$263.17	$258.95
Controllable costs per MWh	Annual Increase GDP IPI [FDD] - 0.3% Productivity Factor	Annual Increase CPI - 0.3% Productivity Factor	$9.02	$9.41	$10.00	$10.11

WNH has consistently ranked in the OEB's Efficiency Assessment Group #3 over the historical period. A Group 3 distributor is defined as having actual costs within +/- 10 percent of predicted costs. Group 3 is considered "average efficiency", meaning costs are within the average cost range for distributors in the Province of Ontario. WNH's goal is to continuously improve and find efficiencies in its capital and OM&A programs; however, WNH expects its efficiency assessment will remain in Group 3 over the forecast period.

Of note, when the 2017 Scorecard was published, WNH had made a request to the OEB to correct a material misstatement WNH had made in the data used for capital additions in 2016. The error has been verified with OEB staff and corrected on the 2017 and 2018 Benchmarking Report, however, the OEB has not corrected WNH's Scorecards since 2017 as a matter of policy. This error placed WNH in efficiency assessment Group 4 instead of Group 3 for 2016. WNH scorecards are a matter of public record and can be found on the OEB Website.

How Historical Performance has affected the DSP (5.2.3d)

WNH's customers clearly indicated that they are very satisfied with WNH's overall performance and that cost is also very important to them. WNH will continually take measures to improve efficiency. This DSP was developed with that goal in mind.

Controllable Cost per Customer will continue to be tracked as a customer-centric performance measure. Upward pressure on this metric will continue as costs increase and customer growth weakens over the forecast period.

WNH can expect Controllable Cost per MWh to increase as peak demand is mitigated through customer conservation and demand management initiatives, load displacement generation and load shifting through time-of use rates. It is WNH's opinion that the Controllable Cost per MWh measure will become less relevant in the future.

2.3.5.2. Financial Ratios

Methods and Measures (5.2.3a)

WNH has a strong record of financial performance and has developed a sustainable investment plan articulated in this DSP. **Table 2-25** provides three of the measures WNH utilizes to track financial performance.

Historical Performance (5.2.3c)

Table 2-25: Historical OEB Financial Ratios

Measures	OEB Target	WNH Target	2016 Actual	2017 Actual	2018 Actual	2019 Actual
Liquidity: current ratio (current assets/current liabilities)	N/A	1.0 to 1.25	1.33	1.41	1.38	1.20
Leverage: total debt (includes short term and long term debt) to equity ratio	<= 60% Debt	< 57% Debt	54.3%	53.7%	53.1%	52.4%
Profitability: return on equity (Corporate ROE)	8.52% +/- 3%	8.52% +/- 3%	9.5%	8.04%	8.01%	7.93%

How Historical Performance has affected the DSP (5.2.3d)

More financial information can be found in **Exhibit #1, Section 2.1.2** EXECUTIVE SUMMARY AND BUSINESS PLAN, Part 7 - Financial Performance**.**

2.3.5.3. Planning Quality & DSP Implementation

Methods and Measures (5.2.3a)

WNH takes a number of measures to monitor and control work programs to ensure they are executed in an efficient and timely manner. First is the regular monitoring of the work programs. Weekly meetings are conducted between Engineering and Operations staff to plan and review the progress of annual capital work programs and communicate issues that may impact on schedule or cost. Similarly, weekly meetings are also held between senior department management and their staff to review capital and maintenance programs in greater detail.

WNH also monitors capital project and maintenance program spending. Actual costs are compared to estimates and variances exceeding designated thresholds require further investigation and explanation by staff. WNH uses KPI's and prebuilt material assemblies in the formation of individual capital project estimates and designs to improve efficiencies and reduce variances. WNH has set variance targets for annual capital expenditures over $50,000 and O&M expenditures over $5,000:

1. On a project level, variances between actual and estimated capital <10%;
2. On department level, total actual vs budgeted expenditures < 2%;
3. Total annual capital program < +/- 2%;
4. 100% completion of projects required to be compliant with regulations.

Programs are expected to be completed in the year for which they were budgeted unless carryovers are approved. Projects carried over into following years could occur due to initial planning; approved changes in project scope; unforeseen projects with higher priority; or project delays due to third parties.

As part of WNH's continuous improvement program, variances that exceed these targets are investigated and lessons learned provides feedback for improvement.

All capital project costs are checked by the project designer at the end of the project for accuracy and against the design estimate. In addition, variances greater than 10% are reviewed by the project Supervisor to provide an explanation for the magnitude of the variance so that future improvements can be made. At the program level, management often needs to alter plans during the course of the year to reflect changing scopes of work and customer demands. It is not unusual for program expenditures to vary by more than 10% from budget. The department level senior management responsible for multiple programs have a target +/- 2% of budget for year-end actual expenditures. Overall corporate expenditures also have an expected target of +/- 2%.

Planned maintenance programs are expected to be completed within the budget year. WNH's target for this measure is also +/- 2% of budget.

Historical Performance (5.2.3c)

Table 2-26: Historical Actual to Plan

CAPEX	2016 - 2019 PLAN CAPEX	2016 - 2019 ACTUAL CAPEX	Variance	% Variance
GROSS	$ 81,260,438	$ 86,380,308	$ 5,119,870	6.3%
Contributed Capital	$ 12,528,310	$ 22,294,574	$ 9,766,264	78.0%
NET	$ 68,732,128	$ 64,085,734	$ (4,646,395)	-6.8%

Table 2-26 provides a comparison of total gross and net Plan CAPEX vs respective actuals between 2016 and 2019. Much of the variance in capital expenditures and contributed capital between plan and actual resulted from the Region of Waterloo Light Rail Transit project.

Following 2016, WNH made adjustments in subsequent years to reduce a portion of its capital expenditures and mitigate the impact on customer's rates. Ultimately over this period, WNH came within 6.3% of the 2016-2019 gross capital Plan expenditures and 6.8% below 2016-2019 net capital Plan expenditures.

How Historical Performance has affected the DSP (5.2.3d)

WNH has demonstrated a reasonable approach to monitoring and pacing capital expenditures to minimize the impact on rates. WNH plans to continue this approach and improve upon it where necessary.

2.3.6. Other Performance Measures

2.3.6.1. System Capacity

This section provides a high level overview of the ability of WNH's distribution system to adequately supply its existing customers and to connect new load and generation customers through the forecast period. More detail information can be found in the following sections of this DSP;

- **Appendix H -** WNH Renewable Energy Generation (REG) Investment Plan.
- **Appendix J** - WNH System Capacity Study.

Methods and Measures (5.2.3a)

The ability of WNH's distribution system to adequately supply its existing customers and to connect new load and generation customers is contingent on the following;

- Supply capacity from grid connected 230 kV and 115 kV transformer stations;
- Supply capacity from < 50 kV points of supply;
- Capacity of WNH's station and distribution equipment to supply the required load
- Ability of WNH's distribution system to redistribute load throughout the system to minimize constraints.

WNH works with the IESO and HONI to ensure there is adequate supply from the transmission system. WNH also works with 3 neighbouring LDCs; Hydro One Distribution (HONI Dx), Kitchener-Wilmot Hydro Inc. (KWHI) and Energy+, to ensure adequate supply from their < 50 kV points of supply. A description of WNH's distribution system can be found in **Section 1.3.8** of this DSP.

WNH's distribution system is summer peaking and WNH uses the annual summer peak to determine allowable capacities and constraints on its system. Transformer stations and their associated switchgear and feeders are WNH's most critical assets when it comes to supplying load. WNH constantly monitors station, bus and feeder loadings through SCADA. All key assets have normal and emergency capacity limits which are alarmed when they are exceeded. On a proactive basis, system operators monitor system conditions and will make operational changes to prevent potential overload conditions. If an overload condition does arise, system operators are alerted by SCADA and take measures to alleviate the problem.

WNH also monitors customer loads and has the ability to measure if a customer's service becomes routinely overloaded and needs to be upgraded. Distribution transformer capacity is also monitored for signs of overload.

The rerouting of load on a distribution system is a normal part of system operations and is needed to prevent overloading of equipment, lowering losses, improving voltage levels and freeing up available capacity to connect new customers. Load imbalances normally occur due to seasonal load fluctuations, unbalanced load growth and equipment outages. Automated switching devices included in WNH's Grid Modernization plan allow the system to be reconfigured as needed. When that ability becomes constrained, WNH invests in Contingency Enhancement investments such as tie lines to improve capacity utilization.

The station and feeder loadings indicate the efficiency and effectiveness of WNH's asset utilization planning and contingency capability.

Historical Performance (5.2.3c)

WNH's distribution system did not experience any lack of supply issues at its points of supply over the historical period. There were no material capacity constraints over the historical period. Where loadings on stations and feeders approached normal limits, operational action was taken to rebalance the load. WNH did make investments in Contingency Enhancement tie lines to improve system operations.

The results of WNH's System Supply and Capacity Study, which can be found in **Appendix J** of this DSP, indicate that the distribution system has adequate capacity to operate over the forecast period. This includes suppling WNH's forecasted load and generation growth. There is no need for additional station facilities during the period of the DSP under present conditions, however, WNH will need to work with the IESO and Energy+ for added supply capacity just beyond this forecast period.

<u>How Historical Performance has affected the DSP (5.2.3d)</u>

Based on load growth leading up to 2016, WNH had forecast the investment of a new grid connected transformer station in the 2022-2023 timeframe. This investment has since been deferred beyond the current forecast period due to slowing growth in peak demand, customers and increased penetration of embedded generation; however, WNH will need to closely monitor and analyze the impact of the aforementioned trends on remaining system capacity in order to make a timely decision.

Investments in Contingency Enhancement tie lines are included in the forecast expenditures to improve capacity utilization of the distribution system.

2.3.6.2. Power Quality

Power quality is a measure of the fitness of electric power supplied to customers. Power quality determines the ability of customer loads to function in their intended manner without significant loss of performance or loss-of-life.

The quality of electrical power may be described as a set of parameters such as:

- Voltage Fluctuations; Sags, Swells, Unbalance
- Transient Voltages and Currents;
- Harmonic Content in the Waveforms for AC power.

WNH investigates 100% of all customer inquiries regarding Power Quality.

i) Voltage Fluctuations

WNH endeavours to maintain steady state voltage limits, under normal operating conditions, at the Customer's delivery points, as specified in the latest edition of the Canadian Standards Association (CSA), C235, **Table 2-27**.

Methods and Measures (5.2.3a)

Table 2-27: CSA Standard CAN3-C235-83

Nominal Voltage	Voltage Variation Limits			
	Extreme Conditions			Extreme Conditions
		Normal Conditions	Normal Conditions	
SINGLE PHASE				
120/240	106/212	110/220	125/250	127/254
240	212	220	250	254
480	424	440	500	508
600	530	550	625	635
THREE PHASE 4W				
120/208	110/190	112/194	125/216	127/220
240/416	220/380	224/388	250/432	254/440
277/480	245/424	254/440	288/500	293/508
347/600	306/530	318/550	360/625	367/635
THREE PHASE 3W				
240	212	220	250	254
480	424	440	500	508
600	530	550	625	635

In addition to the above standard, WNH requires three-phase customers to limit their load unbalance to within 10% between phases. At no time shall the customer's voltage unbalance exceed 5% between phases.

WNH takes appropriate actions to mitigate power disturbances found to be detrimental to the customer and will use WNH's Conditions of Service and appropriate industry standards such as IEEE 1547 (Standard for Interconnecting Distributed Resources with Electric Power Systems) and good utility practice. Where supply voltages consistently lie outside the indicated limits for normal operating conditions but within the indicated limits for extreme operating conditions, improvement or corrective action is taken on a planned and programmed basis. Where supply voltages consistently lie outside the indicated limits for extreme operating conditions, improvement or corrective action should be taken as soon as practical. The urgency for such action will depend on many factors such as the location and nature of load or circuit involved and the extent to which limits are exceeded with respect to supply voltage levels and duration.

Historical Performance (5.2.3c)

Table 2-28 provides historical information on WNH Customer Voltage investigations. All voltage concerns reported by customers were investigated and 100% were resolved in one of two manners;

- determining that there was a problem with the incoming supply at the customer's service entrance and taking corrective action; most common of which are transformer tap changes, connection repairs or replacement of the service conductors supplying the customer, or
- determining that there was no problem with the incoming supply and that the problem existed on the customer's side of the service entrance; most common of which are the customer's main circuit breaker fuses or other equipment or wiring. WNH normally provides advice and information to the customer and their electrician to help identify the problem.

Table 2-28: Customer Voltage Investigations

Year	Total Power Quality Investigations	Customer / Owner Issue	%	WNH Issue	%
2016	115	24	21%	91	79%
2017	109	19	17%	90	83%
2018	115	21	18%	94	82%
2019	120	23	19%	97	81%
Total	459	87	19%	372	81%
Average	115	22	19%	93	81%

How Historical Performance has affected the DSP (5.2.3d)

The costs of voltage investigations and remediation's place upward pressure on O&M costs, however they have not had a material impact on this DSP.

ii) Transient Voltages and Currents

Transient overvoltages are short duration, high magnitude voltage peaks with fast rising edges, commonly referred to as surges. Often described as a “spike”, transient voltages can reach up to 6.0 kV on a low-voltage consumer network, with no more than millisecond duration. These power quality issues occur infrequently. Often the source of such events are:

- Lightning Strikes
- Switching Transient
- Customer owned equipment.

Methods and Measures (5.2.3a)

WNH possesses the equipment and trained staff to investigate these issues and works with the customer to help resolve the problem. Recording analyzers are installed and time stamped events are investigated and normally tracked to a particular event or operation of a piece of equipment.

Historical Performance (5.2.3c)

Occurrences involving transient voltages and currents are infrequent. WNH did not have any power quality investigations involving transients during the historical period.

How Historical Performance has affected the DSP (5.2.3d)

Incidents of transient voltage and current have not affected this DSP.

iii) Harmonic Content

Harmonics in an electrical power system refers to a voltage or current at a multiple of the fundamental frequency of the system, produced by the action of almost any electronic device such as computers, inverters, rectifiers, and electronic ballast lighting. Harmonic frequencies in the power grid are a frequent cause of power quality problems resulting in increased heating in the equipment and conductors, misfiring in variable speed drives, and torque pulsations in motors. These power quality issues are almost entirely customer driven and very difficult for any LDC to mitigate.

Methods and Measures (5.2.3a)

To ensure that the distribution system is not adversely affected by harmonics WNH uses as the guideline “IEEE Standard 519 (IEEE Recommended Practice and Requirements for Harmonic Control in Electric Power Systems - latest edition)”. The voltage harmonic distortion limits are 3% on any individual frequency and 5% on total harmonic distortion. WNH possesses the equipment and trained staff to investigate these issues and works with the offending party to mitigate the problems as they arise.

Historical Performance (5.2.3c)

Occurrences involving Harmonics are infrequent. WNH did not have any Power Quality investigations involving Harmonics during the historical period.

How Historical Performance has affected the DSP (5.2.3d)

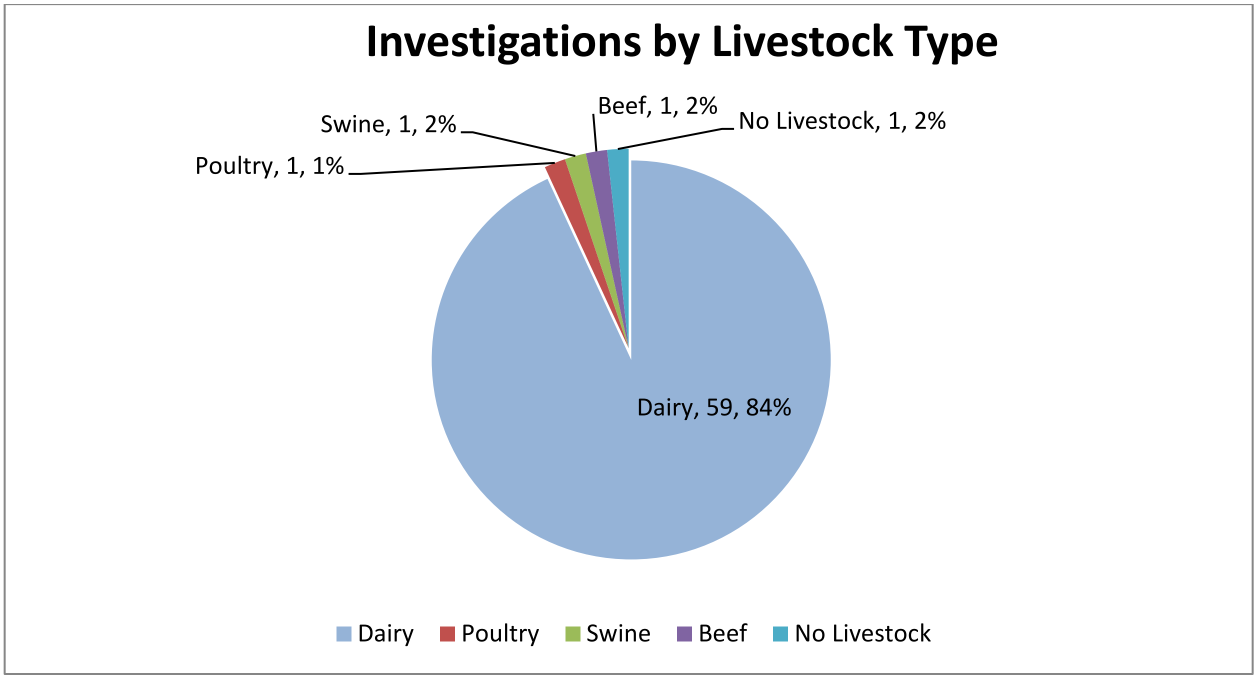
Incidents of Harmonic Content issues are uncommon. They have not affected this DSP nor WNH’s asset management and capital expenditure planning process.

2.3.6.3. Stray Voltage

WNH has a large service area, 90% of which is rural. WNH annually contacts its approximately 900 customers with livestock operations to inform them of WNH services to investigate and remediate stray voltage problems. WNH possesses the equipment and trained staff to investigate these issues and works to mitigate the problems as they arise.

The customer information package WNH provides includes general information on stray voltage and an application form to initiate a utility investigation. Applications for stray voltage investigations are received for a variety of livestock, however, the majority of requests come from dairy farms. The chart below depicts the number of investigations completed between 2010 and 2019 for each livestock type.

Figure 2-5: Investigations by Livestock



Methods and Measures (5.2.3a)

All customer concerns are investigated. WNH follows the "Farm Stray Voltage Distributor Investigation Procedure" as outlined in **Appendix H**. If testing identifies values above the OEB guidelines, WNH will install a solid-state decoupling device (Neutral Isolator) to remedy the problem at no cost to the customer.

Historical Performance (5.2.3c)

WNH completed eight Stray Voltage Investigations in 2019. Two farms tested above the OEB threshold and the problems were resolved with neutral conductor repairs and Neutral Isolator installations.

Figure 2-6 illustrates the distribution of investigations since 2016. In total WNH has completed 70 investigations, 22 during the historical period.

Figure 2-6: Stray Voltage Investigations Completed (2016 – 2019)

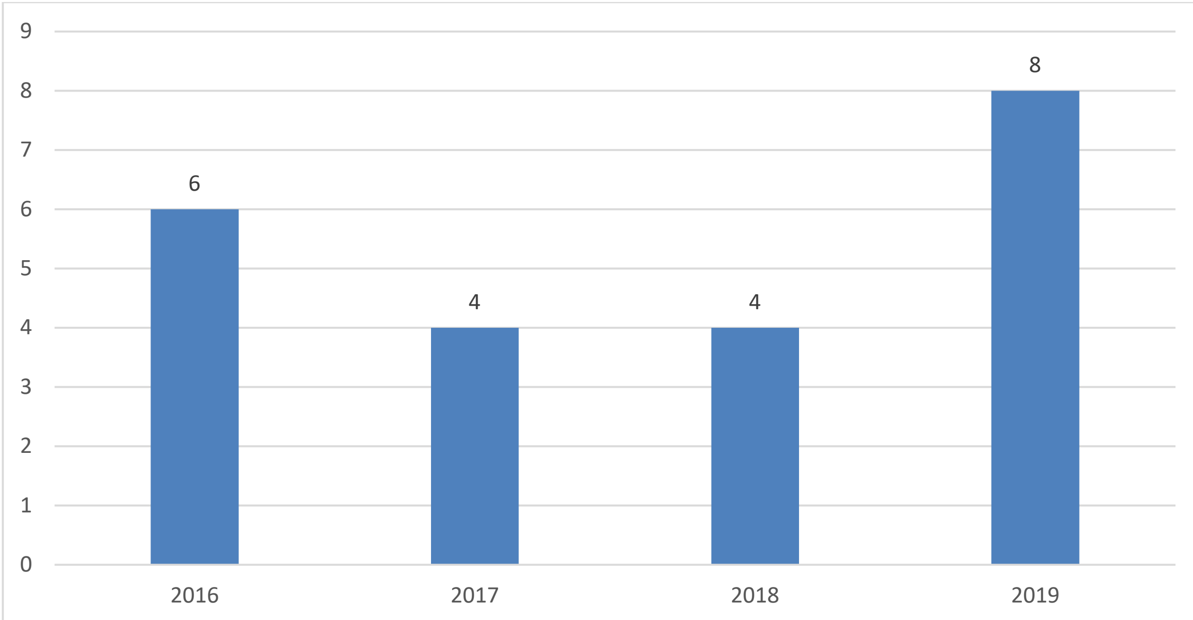
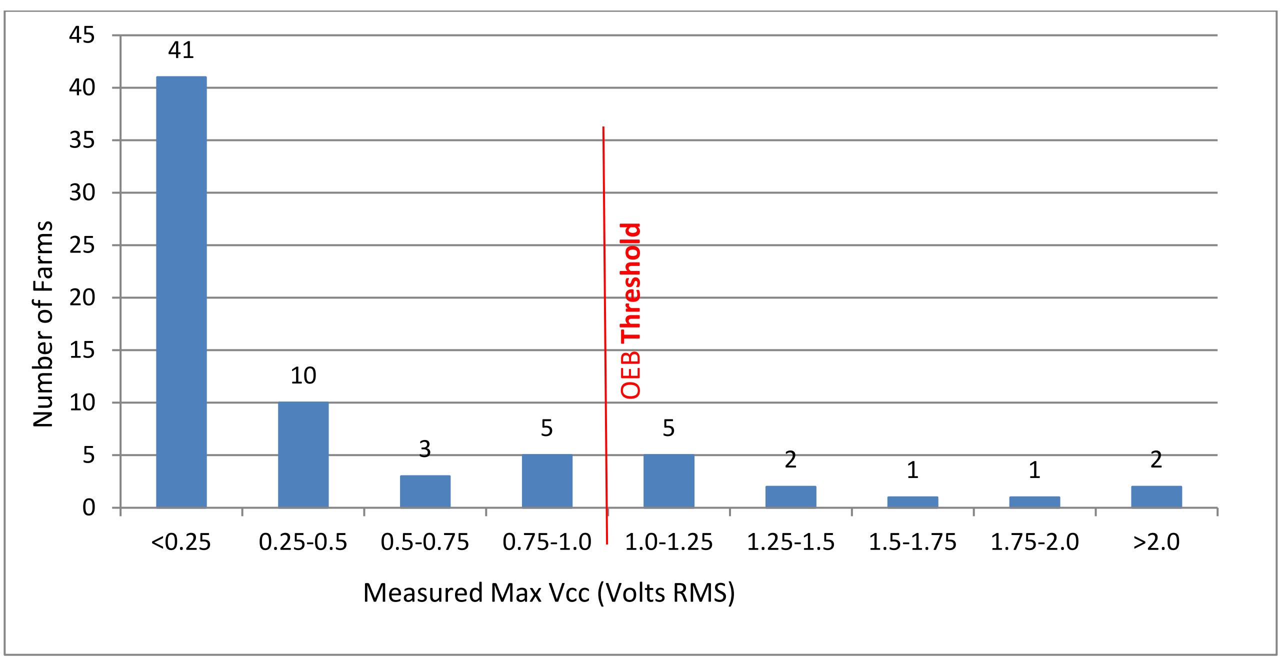


Figure 2-7 illustrates that of the number of investigations completed, only 16% found levels above the OEB threshold.

Figure 2-7: Distribution of Max Contact Voltage (2016 – 2019)



The low frequency of stray voltage incidents in WNH's service territory is representative of the good condition of WNH's neutral and grounding systems and its load balancing efforts on the distribution system.

How Historical Performance has affected the DSP (5.2.3d)

The incidents of Stray Voltage problems are low and often the result of defects on customer premises. The costs to investigate and mitigate are not material and have not affected this DSP.

2.3.6.4. Customer Bill Impacts

Methods and Measures (5.2.3a)

WNH takes the impact of its operations and investments on customer bills very seriously. Annually O&M and Capital investment plans are constructed from the ground up. The senior management team is integral in the development, review and approval of all investment plans. WNH considers customer feedback and rates at neighbouring LDC's when evaluating the impact of proposed rate increases. An analysis of bill impacts for all customer classes at the distribution, delivery and total bill level informs the decision making process before the final investment plan is approved by WNH senior management and the WNH Board of Directors.

Historical Performance (5.2.3c)

For historical performance of bill impacts please refer to:

- **Exhibit #1, Section 2.1.4** Administration, Bill Impacts;
- **Exhibit #1, Section 2.1.6** Application Summary.

How Historical Performance has affected the DSP (5.2.3d)

For how historical performance of bill impacts have affected the DSP please refer to

- **Exhibit #1, Section 2.1.4** Administration, Bill Impacts;
- **Exhibit #1, Section 2.1.6** Application Summary.

2.3.7. (5.2.3b) Unit cost metrics for capital expenditures and O&M

- *Unit cost metrics for capital expenditures and O&M per customer, kilometer of line, and peak capacity as outlined in Appendix 5-A.*

Methods and Measures (5.2.3a)

Cost Metrics

Table 2-29a provides the cost metrics as outlined in Appendix 5-A. Total Cost was calculated combining WNH's total capital expenditures and total operating and maintenance (O&M) costs for the year.

Historical Performance (5.2.3c)

The large decreases in cost-related metrics in **Table 2-29a** are due to the abnormally high level of capital expenditures in 2016 due to the LRT project. More normalized results can be obtained by using a 2017–2020 average found in **Table 2-29b**. Here it can be observed from the metrics that costs have increased, however annual increases have been less than 2% and O&M related costs have been under 1%.

Table 2-29a: OEB Appendix 5-A Metrics

Metric Category	Metric	Measures		% Change 2016-2020	% Annual Change
		2019	2016 - 2020 Avg.		
Cost	Total Cost per Customer	$ 478	$ 506	-26%	-5.3%
	Total Cost per km of Line	$ 16,766	$ 17,650	-26%	-5.1%
	Total Cost per MW	$ 101,891	$ 102,954	-22%	-4.3%
CAPEX	Total CAPEX per Customer	$ 343	$ 372	-34%	-6.8%
	Total CAPEX per km of Line	$ 12,053	$ 12,963	-33%	-6.7%
O&M	Total O&M per Customer	$ 134	$ 134	4%	0.7%
	Total O&M per km of Line	$ 4,713	$ 4,687	4%	0.9%

Table 2-29b: OEB Appendix 5-A Metrics

Metric Category	Metric	Measures		% Change 2017-2020	% Annual Change
		2019	2017 - 2020 Avg.		
Cost	Total Cost per Customer	$ 478	$ 469	5.1%	1.3%
	Total Cost per km of Line	$ 16,766	$ 16,377	6.2%	1.6%
	Total Cost per MW	$ 101,891	$ 97,104	2.4%	0.6%
CAPEX	Total CAPEX per Customer	$ 343	$ 334	6.2%	1.6%
	Total CAPEX per km of Line	$ 12,053	$ 11,654	7.4%	1.8%
O&M	Total O&M per Customer	$ 134	$ 135	2.4%	0.6%
	Total O&M per km of Line	$ 4,713	$ 4,722	3.5%	0.9%

Figure 2-8, Figure 2-9 and **Figure 2-10** illustrate the table Appendix 5-A metrics over the 5-year historical period 2016 to 2019.

Figure 2-8: Historical Costs per Customer

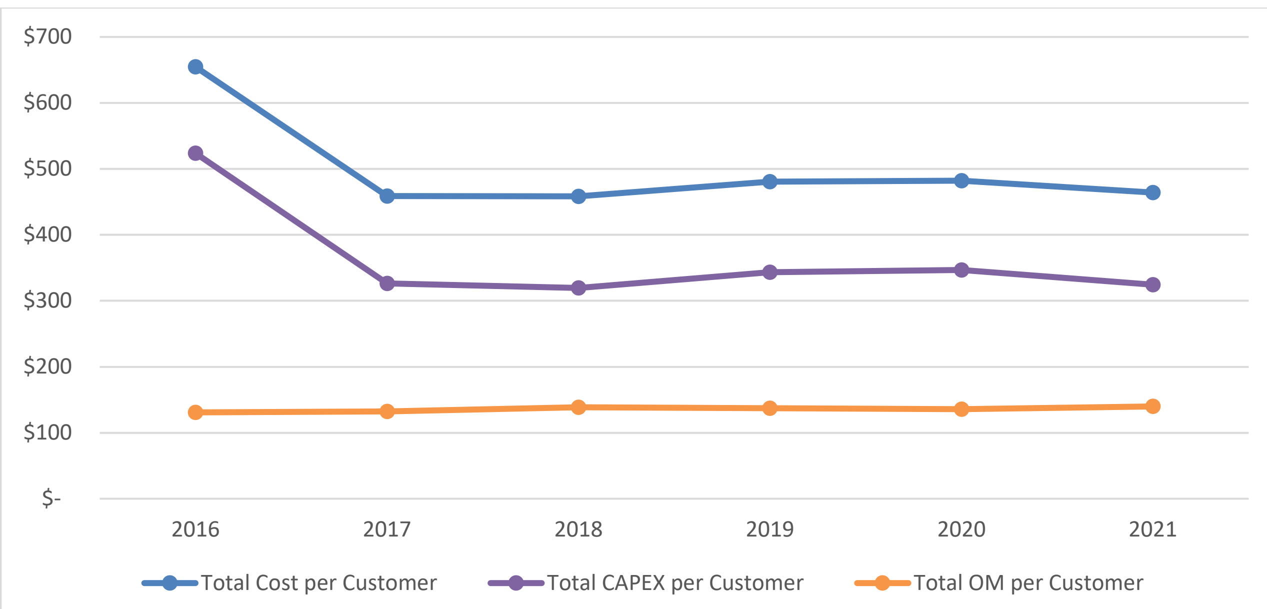


Figure 2-9: Historical Total Costs per km of Line

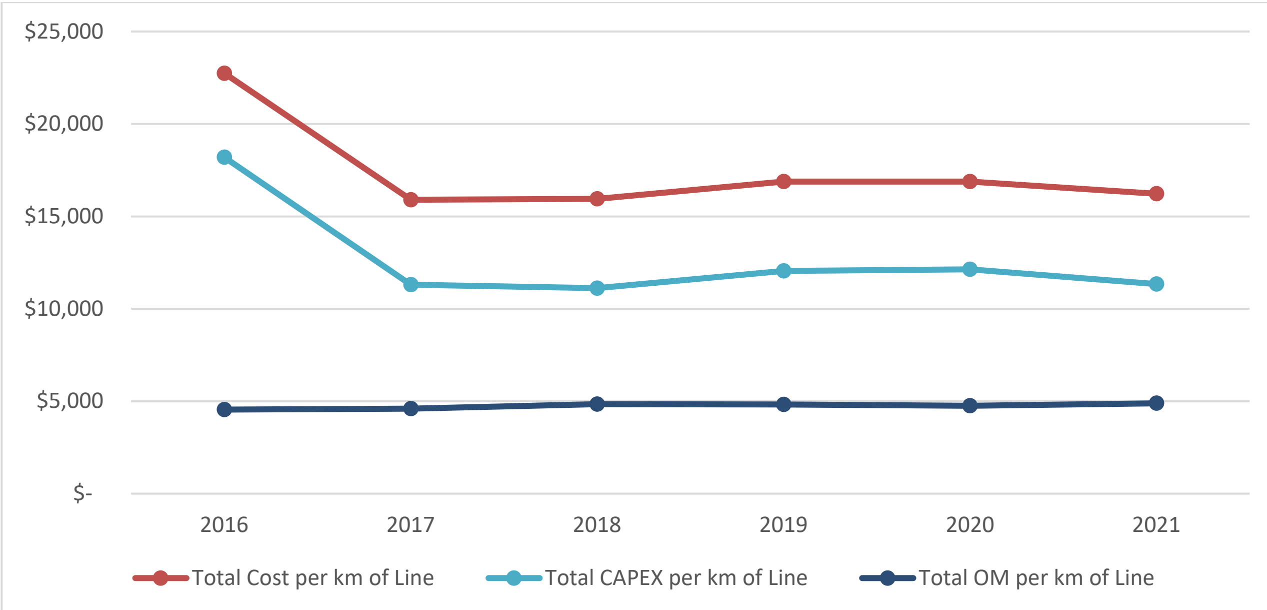
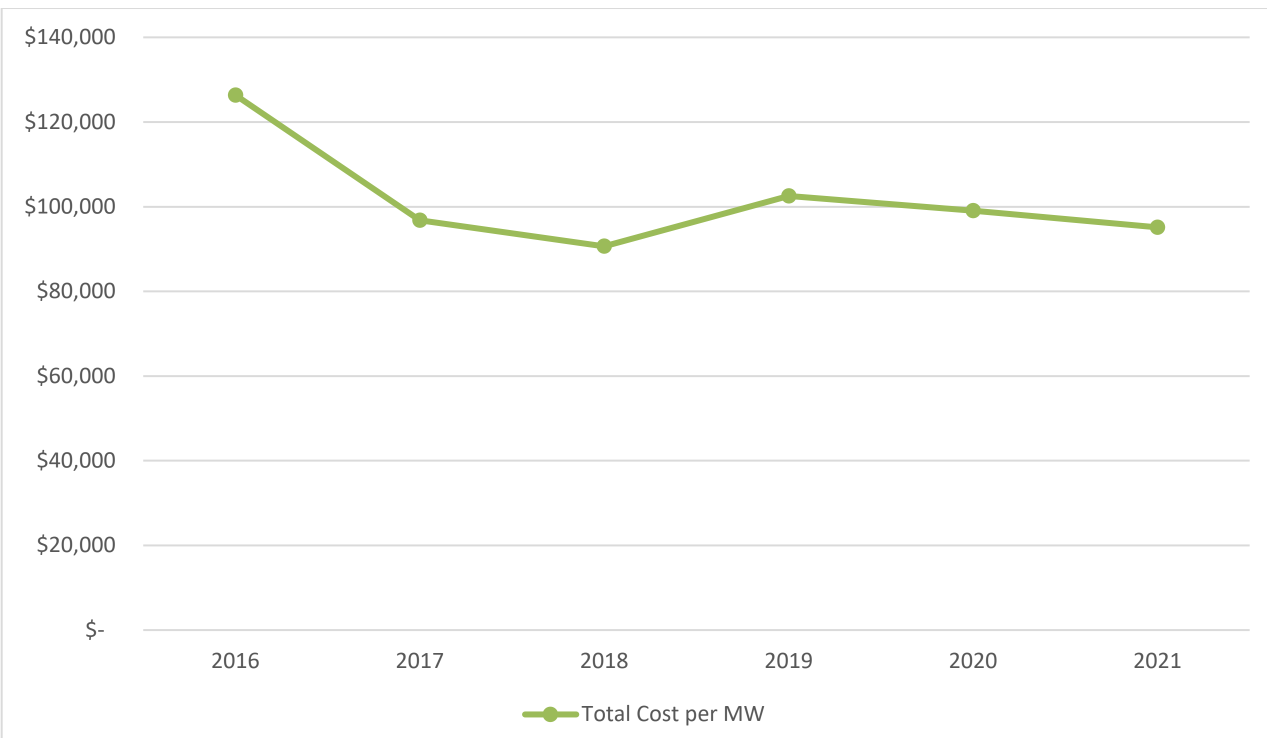


Figure 2-10: Historical Total Costs per MW



How Historical Performance has affected the DSP (5.2.3d)

WNH's historical performance has demonstrated the utility's ability to control O&M costs in spite of upward mounting pressures. WNH has incorporated these same measures and controls in developing this DSP.

It is important to note that WNH has an asset population that is continually growing in size and deteriorating in condition, placing upward pressures on capital and O&M expenditures. WNH will continue to seek productivity and efficiency improvements in both of these areas.

2.4. (5.2.4) Realized Efficiencies Due to Smart Meters

- *A distributor is required to document capital and operating efficiencies that it has realized as a result of the deployment and operationalization of smart meters and related technologies (e.g., Advanced Metering Infrastructure (AMI) communications networks, Operational Data Storage) in its networks. Both qualitative and quantitative descriptions and support should be provided.*

WNH utilizes the SENSUS FlexNet® Metering and Communication network as its Advanced Metering Infrastructure (AMI) solution. The functionality of this AMI has been used in the following manner.

1) Power Outage / Restore messages received through the AMI provides faster and more accurate situational awareness of distribution system operational status leading to faster power outage detection and restoration.

    a) AMI information feeds WNH's Outage Management System (OMS) and combined with geospatial information for each meter and the distribution system electrical connectivity model contained in WNH's ESRI Geographical Information System (GIS), provides the WNH control centre with information on the location and extent of any power outage. This awareness occurs before the first customer call is received and provides better information to be passed on to the customer.

    b) This information also in turn feeds WNH's Fault Location, Identification and Service Restoration (FLISR) system which formulates a restoration plan which SCADA automatically executes. Distribution feeders are reconfigured and the power outage area is minimized, allowing operations to focus on the remaining outage areas. This entire operation is normally performed in under a minute.

    c) Post FLISR, the AMI information continually provides the control centre with the power status of each customer. Individual customers not restored along with the outage area are readily identified and targeted for an on site visit from restoration staff.

2) AMI meters can be remotely interrogated (via pinging) to diagnose power related issues without deploying a crew. The AMI transmits alerts for sags, swells, single phase fail and instrument transformer overload situations. This may lead to an on site assessment and recommendations for corrective action such as transformer tap changes, conductor sizing, conductor run lengths, transformer size etc. For single phase failures and instrument transformer overload alerts, fusing and instrument transformers sizes are checked and corrected if needed. This helps reduce unaccounted for energy losses.

   Through WNH's OMS, system operators also ping customer meters on a restored feeder to determine if any customers remain without power. After an alarmed or reported power outage when none of the adjacent meters are reporting a power outage, the customer is called by the on duty system operator and walked through common problems such as resetting the customers circuit breaker. This provides faster restoration and reduces truck rolls.

3) The information provided by the AMI also provides outage area information which is displayed on WNH's public website outage map. WNH's Outage Management System (OMS) provides customers with real-time information on WNH's distribution system, and shows both planned and unplanned outages. The system displays the area(s) impacted by outages geographically overlaid on a map of WNH's service territory, and shows customers the status of each outage i.e. under investigation, crews dispatched, etc., as well as the number of customers impacted by each outage, and the estimated time of restoration. This reduces the amount of trouble calls and phone line stress to the call center. Table 2-30 illustrates the annual number of visits made to WNH's outage map.

Table 2-30: WNH Power Outage Map Usage

Year	Number of Outage Map Visits
2016	42,000
2017	29,000
2018	45,600
2019	38,000
Average	38,650

4) Meter data has always been used to monitor distribution transformer loading, however in its hourly format, AMI data allows WNH to better calculate loading profiles to improve proactive upgrading of the transformers. This leads to fewer low voltage complaints and transformer failures due to overloading.

5) AMI data is more detailed in providing better customer energy use data throughout the day. This enables customers to better manage their energy consumption. Through WNH's My Portal, information on their electricity consumption including a customer's monthly, daily and hourly usage can be accessed from a personal computer, tablet, or mobile phone 24 hours a day, seven days a week.

6) AMI data is imported into WNH's Synergi load flow software to provide more timely and accurate distribution system analysis.

WNH does not have quantitative data to support the incremental savings of these efficiencies. WNH's data and information system do not support such detailed tracking.

Distributors are required to deploy "metering inside the settlement time frame" (MIST) to applicable general service => 50 kW customers by Dec 31, 2020. WNH forecasts that this work will be completed by August 20, 2020.

3. (5.3) ASSET MANAGEMENT PROCESS

3.1. (5.3.1) Asset Management Process Overview

- *This section provides 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.*

3.1.1. (5.3.1a) Asset Management Objectives & Corporate Goals

- *A description of the distributor's asset management objectives and related corporate goals, and the relationships between them, including an explanation of how the distributor ranks asset management objectives for the purpose of prioritizing investments.*

WNH's Mission, Vision, Corporate Values and Strategic Imperatives **(Section 1.3.2)** define the organization, how it operates and provides guidance to its strategic planning and asset management processes.

WNH's Strategic Imperatives were developed and ranked **(Table 3-1)** by the WNH Board of Directors and senior management through a series of collaborative strategic planning sessions. Formalized in 2003, these imperatives have been revisited and reaffirmed over time and have guided WNH's asset management and investment planning processes.

To provide alignment with its Corporate Values and Strategic Imperatives, WNH manages its assets while recognizing realistic service and performance goals. Customer expectations for the delivery of safe, reliable electricity at a reasonable price have to be respected. The following considerations are critical to WNH's asset management strategy:

- Activities should demonstrate good stewardship in the long term up-keep and growth of the distribution system;
- Service delivery should be safe, fair and consistent within all customer groups;
- Performance measures should demonstrate progress towards and/or achievement of the goals within reasonable budget considerations;

- Maintenance plans should be consistent with good utility practice and capture specific items from the annual assessments and any specific customer needs;
- Capital budgets should justify proposed expenditures and be flexible to respond to new priorities;
- The asset management strategy should create opportunities for improved efficiencies;
- The asset management strategy should find the right balance between capital investments and O&M costs so that the total cost over the life of the asset is minimized;
- Annual reviews of asset management goals, strategies and outcomes should be performed.

Table 3-1: WNH Strategic Imperative Ranking and Weighting

Priority	Corporate Strategic Imperatives	Relative Weighting for Investment Prioritization	% Scale
1a	Supply	5.0	100%
1b	Reliability	4.5	90%
2a	Health, Safety	4.0	80%
2b	Environment	3.5	70%
3	Customer Service	3.5	70%
4	Employee Relations and Development	3.0	60%
5	Productivity and Cost Reduction	2.8	56%
6	Organizational Effectiveness	2.5	50%
7	Financial Performance	2.2	44%
8	Shareholder and Community relations	1.0	20%
9	System Aesthetics	0.5	10%

WNH's Strategic Imperatives form the foundation for WNH's asset management objectives. For asset management purposes, seven of these imperatives have been adopted as WNH's Asset Management Objectives and are part of WNH's investment prioritization process.

1a) Electrical Supply – Electrical Supply is the foremost consideration in WNH's management of assets. Adequate electrical supply allows our local economy to sustain itself and allows local government and business leaders to attract business to the Region in what is a very competitive global economy. Opportunities lost due to inadequate electrical supply do not only impact future WNH revenue growth but also community jobs, tax base and secondary development.

1b) Reliability – Reliability is a prominent consideration as it is the key measure of how well WNH is fulfilling its mandate to supply electricity to its customers. The importance of electrical supply reliability has been a consistent message WNH has received from all of its stakeholders through its many consultations. Reliability is an important contributor, both for business and for residential customers, to the prosperity of the community.

2a) Health and Safety – WNH owes a legal and moral duty to its workers, customers and the public to carry out its business in a safe and responsible manner.

2b) Environment – WNH is committed to environmental stewardship through conservation and sustainable business practices.

3) Customer Service – WNH has customer service level expectations and targets that are both adopted and imposed. There are many inputs that contribute to the ultimate service provided to customers. Each of WNH's strategic objectives can, in isolation, have positive or negative influences. WNH believes it is important to consider the effect of its combined objectives on customer service in order to provide better insights and balance to WNH's investment decision making process.

5) Productivity and Cost Reduction – WNH understands that its own success and that of its customers depends upon the affordability of the services it delivers. WNH actively investigates opportunities to improve value and lower the costs of its operations without sacrificing service levels. Although cost pressures such as labour and material inputs,

regulatory requirements and service levels continue to increase, WNH continues to focus on improvement in this area.

6) Organizational Effectiveness – WNH considers organizational effectiveness as a key factor in supporting: cost reduction; health, safety and environmental improvements; timeliness of service delivery; O&M execution; and capital investment planning.

9) System Aesthetics – WNH's consultations have provided various stakeholder groups in the community an opportunity to express their support for more aesthetically pleasing forms of distribution construction. WNH adheres to service levels as prescribed in its Conditions of Service, overarching regulations, adopted standards and good utility practice. Although not ranked as high as other strategic objectives, aesthetics is taken into consideration on all projects, and when balanced with other strategic objectives positive outcomes, can be realized.

3.1.2. (5.3.1b) Components of the Asset Management Process

- *Information regarding the components (inputs/outputs) of the asset management process used to prepare a capital expenditure plan, including the identification and description of the data, primary process steps, and information flows used by the distributor to identify, select, prioritize and/or pace investments*

3.1.2.1. Asset Management Process Overview

Asset management is the management of physical infrastructure throughout its entire life cycle with the goal of optimizing total life cycle costs and performance. WNH's AMP utilizes a total life cycle approach in managing its major assets. Please refer to **Section 3.3** for more information on WNH's total life cycle approach.

Asset management enables WNH to realize value from assets in the achievement of its organizational objectives. Asset management supports the realization of value while balancing financial, environmental and social costs, risk, quality of service and performance related to assets.

The benefits of asset management can include, but are not limited to the following:

a) improved financial performance: reducing costs or mitigating cost increases without sacrificing the short or long-term realization of organizational objectives;

b) informed asset investment decisions: improving decision making and effectively balancing costs, risks, opportunities and performance;

c) managed risk: reducing risk of catastrophic asset failure; maintaining public safety, good will and reputation; minimizing environmental and social impact, reducing the risk of fines and penalties;

d) improved services and outputs: assuring the level of distribution system performance and capacity can support services that consistently meet or exceed the expectations of customers and stakeholders;

e) demonstrated social responsibility: improving the organization’s ability to reduce emissions, conserve resources, adapt to climate change and demonstrate environmental stewardship;

f) demonstrated public policy responsiveness: transparently conforming with legal, statutory legislative and regulatory requirements;

g) enhanced reputation: through improved customer satisfaction, stakeholder awareness and confidence;

h) improved organizational sustainability: effectively managing short and long-term effects, expenditures and performance, can improve the sustainability of operations and the organization;

i) improved efficiency and effectiveness: reviewing and improving processes, procedures and asset performance can improve efficiency and effectiveness, and the achievement of organizational objectives.

To achieve WNH’s asset management goals and objectives, the AMP utilizes a systematic approach which:

1. collects, tabulates and assesses information on
   a. physical assets,
   b. current and future system operating conditions and
   c. business and customer service goals and objectives.

2. plans, prioritizes and optimizes expenditures on
   a. system-related modifications,
   b. renewal and operations and maintenance, and
   c. general plant facilities, systems and apparatus.

3.1.2.2. Asset Management Process Inputs & Outputs

WNH's systematic approach to asset management is supported by the following processes which inform the AMP:

- robust inspection, testing and maintenance programs;
- extensive consultations with customers and other stakeholders;
- system planning and system capacity analysis;
- asset condition assessments supported by health index frameworks and asset management tools;
- asset condition depreciation trending;
- system performance trending;
- automation of tasks for data collection, asset reporting etc.;
- change management to ensure data integrity.

Specifically, the inputs into the AMP are as follows:

- customer needs and preferences;
- public policy responsiveness directives;
- key information pertaining to major assets (Asset Register), including age, location, demographics, physical characteristics;
- probability of failure and typical useful life data;
- asset health scores;
- risk factors;
- system capacity utilization and constraints;
- historical reliability performance data – equipment failures, outages, worst performing feeders;
- asset condition and reliability performance targets.

The outputs of the AMP process are as follows.

- Prioritized one-year Capital and O&M investment plan;
- Five-year Capital and O&M investment plan.

3.1.2.3. Primary Process Steps

Figure 3-1 illustrates the primary process steps in WNH's asset management process, capital expenditure process, and their contribution to the development of WNH's Capital and O&M investment plan.

A) Asset Register

WNH maintains a register of its largest and most significant assets. Depending on the asset class, available data can include one or more of the following quantities: age, condition, location, inspection data, test data, operational performance and health rating. This data is maintained in various software data bases such as Geographic Information System (GIS), Operational Data Store (ODS), Customer Information Systems (CIS), Enterprise Resource Planning (ERP), Power Interruption Logging and Reporting (PILAR), Transdat and numerous Excel data files.

Individual asset information is kept current as part of ongoing inspection, testing, maintenance and capital replacement programs. For asset management purposes, WNH's distribution assets are categorized in the major groups found in **Table 3-2**.

B) O&M Programs

WNH has well-established comprehensive inspection, testing and maintenance programs to provide for on-going asset condition assessment. These O&M programs have been developed and refined over time from manufacturers' recommendations; historical findings; industry practices; WNH's past experience and prescribed requirements.

These programs are executed at various times and by various means. They yield asset condition information upon which the Asset Register information is updated and asset condition assessments are performed. Further information on WNH's O&M programs is provided in **Section 3.3.1.3** WNH Inspection and Maintenance Programs.

Figure 3-1: WNH Asset Management and Capital Expenditure Process

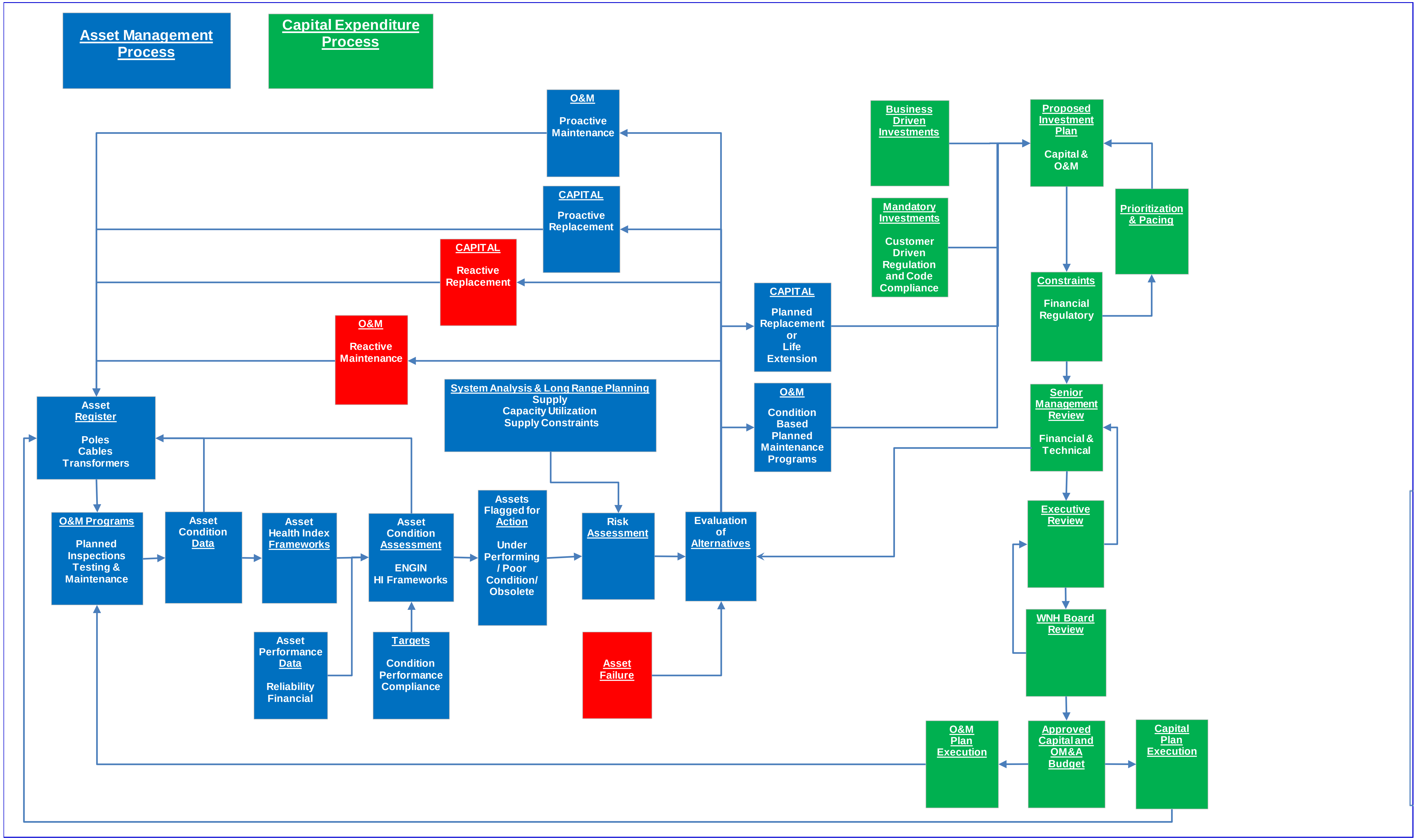


Table 3-2: WNH Major Asset Registry

Major Asset Categories		
Transformer Stations		Distribution Transformers
Transformers		Polemount
Switchgear		Padmount
Circuit Breakers		Submersible
Protection Systems		Vault
Feeders		Fleet
Batteries		Large Vehicles
Distribution Stations		Medium Vehicles
Transformers		Small Vehicles
Switchgear		Rolling Stock
Circuit Breakers / Reclosers		Meters
Protection Systems		Residential
Feeders		Commercial & Industrial
Poles		<50 kW
Wood		>=50 kW
Concrete		Large user >5000 kW
Steel		Wholesale
Underground Cable		Information Technology Software & Hardware
Primary XLPE		Corporate Systems, ERP including AP/AR, GL, Payroll ODS/ CIS / HR / Doc Mgmt. / Email /Web
Primary TRXLPE		Servers & Peripherals
Secondary		Computers / Desktop / Laptops / Tablets
Reclosers		Operational Technology Systems
Capacitors		SCADA / ODS / OMS / GIS / AMS

C) Condition Assessments

WNH developed, with the aid of METSCO, Asset Condition Assessment Frameworks that apply condition based metrics and targets to the asset condition data to develop Health Index scores for each asset.

In 2019, WNH also started to use METSCO's Asset Analysis, Prioritization and Optimization Tool (ENGIN). Moving towards a fully risk-based approach, inputs for this tool include asset condition, probability of failure, number of customers impacted, risk factors, budget and resource constraints, schedule, remaining useful life of the asset, reliability data, availability of temporary measures and other consequences of failure. Not yet fully developed, WNH has utilized this tool to perform asset analysis and develop Health Index scores for its pole and cable replacement program. This tool will be extended to WNH's other major distribution asset categories and is expected to provide full risk based analysis by the end of 2022.

These tools flag–for-action assets that are underperforming or at high risk of failure and assign individual health condition scores. The assets are also categorized into Health Condition Categories ranging from very good to very poor. This assists with the identification, selection and prioritization of renewal investments while also bringing improved standardization to asset condition assessment and asset health grading.

More specific information of asset condition assessments can be found in **Appendix A –** WNH Asset Condition Assessment Report.

D) Evaluation of Alternatives

For assets flagged-for-action, alternatives are developed and evaluated. Outputs from this analysis form either a condition based maintenance solution or a capital investment solution involving asset replacement or life extension.

Depending on the type of asset and the nature of the degradation factor, maintenance is always a first consideration if it will provide a satisfactory outcome; meaning, that the maintenance activity will reduce the risk of failure to allow the asset to remain in service in a cost effective manner. The maintenance activity may be performed immediately or scheduled as part of a planned maintenance program.

If maintenance is not an option, then WNH selects one of a number of capital replacement options.

- Assets that fail while in service are normally assigned to WNH's Reactive Renewal Program. Not all asset failures create a power outage. Depending on the asset, type of failure, and contingency alternatives, assets could be replaced immediately or switched out of service for further evaluation and action.

- Assets in service and identified as in immediate danger of failure are assigned to WNH's Proactive Renewal Program. Depending on the condition, assets are planned for replacement anywhere from next day to 12 months.

- Assets in service and in very poor or poor condition are assigned to WNH's System Renewal Plan. Depending on the condition and risk assessments, assets are normally replaced anywhere from 1 to 2 years.

- Assets in Fair condition are monitored and may be revaluated in the upcoming 2 to 5 years to determine their rate of degradation. This may require additional inspection and testing.

- All assets are revaluated as new inspection, testing, performance and financial data become available. Replacement of assets evaluated in Good and Very Good condition generally fall outside the current 5-year renewal plan.

As part of developing any replacement option, asset refurbishment (Life Extension) is always considered. Refurbishment is normally labour intensive and generally not cost effective for low-unit-cost assets such as poles, wire, and insulators. Additionally, some assets are not appropriate candidates for refurbishment as compliance with Ontario Reg. 22/04 may not be attainable. Refurbishment becomes a more viable option with high cost specialized assets such as station circuit breakers, switchgear, tap changers and power transformers.

E) Mandatory Investments

All investments required to be compliant with code or regulations are automatically selected for WNH's capital investment plan. These investments normally fall into the category of System Access and include customer connections, expansions, third party requests, regulatory changes or mandated initiatives. The level of expenditure is driven by growth forecasts, various consultations, historical activity and public responsiveness measures along with O&M and capital plans from WNH's Proposed Investment Plan.

F) Selection, Prioritization and Pacing of Investments

Senior Engineering and Operations management have the responsibility for Asset Management at WNH and are an integral part of the evaluation and development of all proposed capital and O&M investments. Along with the WNH Executive, this is an iterative process culminating in a balanced investment plan that is recommended to the WNH Board of Directors for approval.

Further information on WNH's Selection, Prioritization and Pacing process can be found in **Section 3.3.1.4** - Asset Replacements Prioritized and Scheduled to align with Budget Envelopes, and **Section 4.2.2** - Processes, Tools and Methods used to identify, select, prioritize and pace the projects/programs.

3.1.2.4. Asset Capacity Utilization / Constraint Assessment

Maintaining an adequate and reliable electrical supply are WNH's top strategic imperatives and Asset Management Objectives are key in supporting Ontario's Long-Term Energy Plan (Ensuring a Resilient Energy Supply). Maintaining adequate capacity throughout WNH's distribution system goes hand in hand with these objectives.

WNH's SCADA and AMI systems continuously collect and monitor data on infrastructure assets such as supply points; transformer stations, distribution stations, station busses, feeders, reclosers, distribution transformers and larger embedded generators. Data collected includes loading, voltage, device temperatures, online transformer DGA and more. Capacity limits programmed into SCADA warn operators of approaching limits or exceedances.

Collected data informs WNH's System Analysis and Long Range Planning process which is part of WNH's overall Asset Management and Capital Expenditure Process. The magnitude and trending of loading data is analyzed. Engineers employ load flow analysis on a connectivity model of WNH's distribution system comparing modeled against actual performance. Generation levels and trends are also monitored for potential impacts on the distribution system. If existing or impending system supply or capacity constraints are identified, plans are developed along with expenditure and scheduling recommendations.

The plans developed through WNH's System Analysis and Long Range Planning process then undergo a risk assessment, evaluation of alternatives assessment and are selected, prioritized and paced along with WNH's other proposed capital investments.

Please refer to **Appendix J** – WNH System Supply and Capacity Study for a full asset capacity utilization and constraint assessment.

3.1.2.5. Historical Period – Customer Interruptions due to Equipment Failure

Good reliability performance is consistently at or near the top of WNH's customers' stated preferences. It is one of WNH's top two Strategic Imperatives and Asset Management Objectives. Good reliability also helps support the achievement of the OEB's key performance outcome of Operational Effectiveness as established in the Renewed Regulatory Framework for Electricity (RRFE).

Table 3-3 summarizes WNH's record of CMI due to Defective Equipment from 2016 to 2019. Defective equipment accounted for 9.3% of all CMI from 2016 – 2019.

Table 3-3: Defective Equipment CMI (2016 - 2019)

Year	Total CMI	Cause Code "5" Total CMI	% CMI	Total Events	Cause Code "5" Total Events	% Events
2016	9,580,465	266,817	2.8%	811	97	12.0%
2017	2,930,075	535,964	18.3%	739	111	15.0%
2018	7,156,980	803,865	11.2%	786	132	16.8%
2019	3,891,102	576,266	14.8%	791	107	13.5%
Total	23,558,622	2,182,912		3,127	447	
Avg.	5,889,656	545,728	9.3%	782	112	14.3%

Waterloo North Hydro's "Distribution System Reliability Report" which can be found in **Appendix K** of this DSP, provides a consolidated view of WNH's reliability performance over the period covering 2016 – 2019 inclusive.

3.1.2.6. Worst Performing Feeder

Annually, WNH analyses and ranks feeder performance and focuses on worst performing feeders. More specifically, WNH utilizes sustained outage information, cause codes, historical data and other pertinent information combined with data and geospatial analysis to identify under performing assets or groups of assets that require attention. It is uncommon, even for a worst performing feeder, that the entire feeder contributes equally to the degradation in reliability.

Table 3-4 summarizes WNH's worst performing feeder experience since 2016. Annually, WNH reviews feeder reliability data on a 1-year, 3-year and 5-year basis. Outcomes from this process can drive activities that range from minor to material. **Table 3-4** is colour coded to illustrate a feeder's ranking in any particular year.

Table 3-4: Worst Performing Feeders (2016 - 2019)

Feeder #	2016	2017	2018	2019	3-Year Average	5 Year Average
HS22	56,289	376,305	269,864	476,499	374,223	242,664
3F68	29,779	95,748	144,302	216,539	152,196	100,257
HS20	118,855	215,197	136,402	49,337	133,645	105,488
HS11	8,321	5,849	180,538	183,445	123,277	100,694
3F61	10,337	331,633	24,170	11,919	122,574	77,722

Worst Performing Feeder Ranking	1st	2nd	3rd	4th	5th
Colour Code					

Minor maintenance activities would normally be driven by annual performance and can include locational insulator washing, animal guarding, tree trimming or connection repairs.

More moderate actives would normally be driven by annual or 3-year performance and could include installation of grid modernization technologies, replacement of individual assets such as switches, poles, cables, or the re-insulation of line sections.

Lastly, significant capital renewal investments may have to be made to bring sections of the worst preforming feeders up to current construction standards. This is normally driven by 3-year feeder performance data.

Although WNH monitors 5-year performance data, the time frame is generally considered too long for the past data to remain relevant. This can be due to recent feeder configuration changes, grid modernization investments and reliability issues that were previously addressed.

Waterloo North Hydro’s “Distribution System Reliability Report” which can be found in **Appendix K** of this DSP, provides a consolidated view of WNH’s reliability performance over the period covering 2016 – 2019 inclusive.

3.1.2.7. Reliability Risk / Consequence of Failure Analysis

WNH assesses reliability risk using two different methodologies.

For condition based distribution investments (System Renewal), WNH has started to utilize METSCO's ENGIN which takes the probability of asset failure developed from standardized failure curves aligned with the typical useful life of the asset. The consequences of failure are determined by examining the number of customers and load impacted by an asset failure. This information comes from WNH's distribution system connectivity model. The product of probability of failure and customers impacted provides a risk factor that is used to help prioritize asset replacement. For this DSP, this methodology is being used for poles and underground primary cable. For other distribution assets, the asset Health Index score is used as a proxy for probability of failure. The lower the health index the higher the probability of failure.

For System Service investments focused on reliability (worst performing feeders), WNH examines the feeder's historical reliability, the expected improvement to be made by the investment and the number of customers impacted. The product of reliability improvement and customers impacted provides a risk factor that is used to help prioritize asset replacement.

Further discussions on risk can be found in the following sections;

- **Section 1.3.7;**
- **Section 3.3.2;**
- **Section 4.2.1.**

3.2. (5.3.2) Overview of Assets Managed

3.2.1. (5.3.2a) Description of features of the Distribution Service Area

- *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 DSP.*

Section 1.3 of this DSP provides a fulsome description of WNH's distribution service area.

3.2.2. (5.3.2b) Description of system configuration

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

Please refer to **Section 1.3.8** of this DSP.

3.2.3. (5.3.2c) Asset type profile and condition

- *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.*

Detailed information on distribution system assets managed by WNH including information such as asset type, age, quantity, and condition can be found in **Appendix A** – WNH Asset Condition Assessment Report.

Unless otherwise stated, the information contained in this report is current as of December 31, 2019.

3.2.4. (5.3.2d) Capacity of Existing System Assets

- *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*

Appendix J - WNH System Supply and Capacity Study provides a full assessment of the degree to which the capacity of WNH's distribution system assets are utilized relative to equipment rating and planning criteria. Data provided is current as of Dec 31, 2019.

Overall, WNH supply and capacity levels are adequate to sustain the forecasted load growth to the end of 2025. Capacity levels that are nearing limits are noted and mitigation measures are being taken in the DSP. These measures are mostly about rebalancing of feeder loads to improve utilization of existing assets.

3.3. (5.3.3) Asset Lifecycle Optimization Policies and Practices

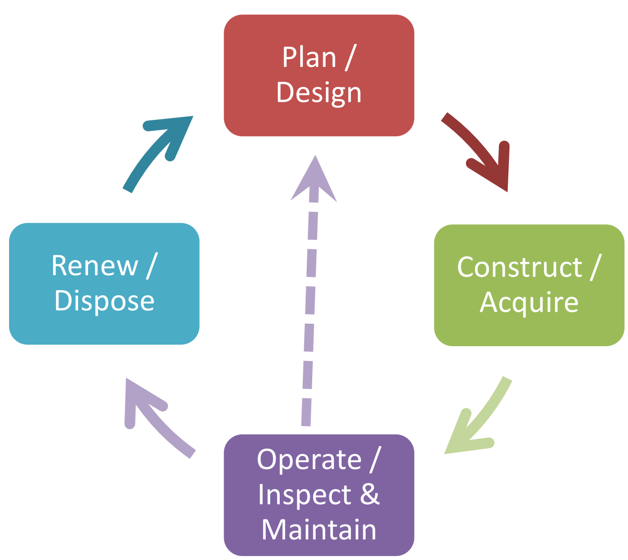
3.3.1. (5.3.3a) Asset Lifecycle Optimization Policies and Practices

- *A description of asset replacement and refurbishment policies, including an explanation of how (e.g. processes, tools) system renewal program spending is optimized*
- *A description of routine system operations and maintenance (system operating and maintenance (O&M)) activities carried out to sustain required distribution system performance to the end of the subject asset's service life. Including but not limited to preventative inspection and maintenance policies, practices and programs (can include references to the Distribution System Code (DSC))*
- *A description of how asset replacements are 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*

3.3.1.1. (5.3.3a bullet-1a) Asset Replacement and Refurbishment Policies

WNH's Asset Management Strategy uses a full lifecycle approach to managing its distribution assets which is illustrated in **Figure 3-3**.

Figure 3-3: WNH Asset Lifecycle Process



WNH is also focused on evidence-based decision making to support and optimize system renewal investment decisions.

Plan / Design – Annually, WNH prepares a one-year capital budget and a five-year capital investment plan which are informed by inspection and maintenance findings, regular asset condition assessments (ACA), operational performance, regulatory compliance, customer consultations, load growth and corporate business needs. These factors are evaluated against WNH business plans, strategic imperatives, reliability targets, health index targets, and asset utilization limits. Risks are identified and investments are prioritized. WNH attempts to optimize its investment portfolio by selecting investments which provide the greatest reduction in risk per investment dollar. Financial and resource constraints inform the pacing of investments over the combined six-year period.

During the design stage, standards, material specifications, input from operational performance, inspections and maintenance findings all inform the design process to improve and optimize project spending.

Construct / Acquire - After the planning and design phase is completed, the asset is constructed and/or acquired and placed into service. Costs to place assets into service are reviewed and compared to estimates. Material variances are analyzed in an effort to inform and improve the design process. See **Section 2.3.5.3** Planning Quality & DSP Implementation for more detail.

Operate, Inspect and Maintain – The longest phase of the asset life cycle, this stage is focused on asset performance and condition assessments. Data collection is ongoing through the asset lifecycle and maintained in an asset register. Regular review and analysis of asset data health and performance informs the planning and design stage to improve the next cycle of asset additions or replacements. Analysis also informs the disposal/ decommissioning stage by helping develop trending data to estimate asset EOL.

Renew / Dispose - Assets reach EOL based on a combination of factors such as health, performance, risk and functional obsolescence. Not all assets end their lifecycle in the same manner or at the same time. Review and analysis of asset data health and performance at EOL informs the planning and design stage to improve the next cycle of asset additions or replacements.

Assets reach EOL based on a combination of technical and economic factors including; asset performance; condition; age; probability of failure; criticality or consequence of failure; maintenance options; replacement and refurbishment cost and lead time options. A determination must be made from one of several options. WNH utilizes a three-part strategy to minimize the lifecycle cost of an asset.

1. Asset Maintenance – normally maintenance has been conducted on the asset prior to EOL to prevent this stage from occurring. Additional maintenance at EOL stage is not often effective in extending life and many assets do not have viable maintenance options.

2. Asset Refurbishment – As part of developing any EOL option, asset refurbishment (Life Extension) is always considered. Many distribution assets such as wire, insulators, lightning arrestors and poles for example do not lend themselves to refurbishment. Assets such as distribution transformers can be refurbished but generally not in a cost effective manner. Additionally, some assets are not appropriate candidates for refurbishment as compliance with Ontario Reg. 22/04 may not be attainable. Refurbishment becomes a more viable option with high cost specialized assets such as station circuit breakers, switchgear, tap changers and power transformers. WNH has performed cost effective life extending refurbishments on assets such as station transformers, switchgear, circuit breakers, tap changers, voltage regulators, switchgear and fleet. The savings that accrue from the refurbishment of assets are highly dependent on the type of asset, asset condition and performance. Refurbishments also involve extensive feasibility discussions with third party vendors or suppliers.

3. Asset Replacement - for most WNH assets, replacement is the only option. WNH utilizes one of the following replacement strategies depending on the asset function, asset condition, and the cost effectiveness of each strategy.

    a. "Do not replace", is always an option to be considered. The asset's function may have become surplus or redundant. Retirement of 4.16 kV stations, voltage regulators, and capacitor banks due to new higher distribution voltages is but a few examples.

    b. Proactive Replacements are planned asset replacements based on the technical and economic factors previously mentioned. WNH utilizes two types of proactive replacement strategies:

        i. Like for like replacements are performed if functional or performance requirements have not changed during the past asset lifecycle. Many of WNH's System Renewal investments fall into this category.

        ii. When new standards, performance or functionality requirements do not allow for a like-for-like replacement, replacement assets must be modified or upgraded. This makes up the majority of WNH's System Renewal investment as the 30 to 60-year-old assets being replaced today do not meet current day requirements.

    c. Reactive Replacement (Run to Failure) maximizes an asset's value, however it also can also have negative impacts on reliability and safety. This strategy is used mainly for low value, low risk distribution assets where like-for-like replacement is possible and incidents of failure are low. When incidents of asset failure accelerate or cluster and become a cause for concern, a switch to a proactive replacement strategy is employed. Assets that are commonly run to failure include distribution transformers, pole line hardware, lightning arrestors, meters, underground cable in duct.

All of these considerations inform the Planning/Design stage and help optimize the new lifecycle of asset investments.

3.3.1.2. (5.3.3a bullet-1b) System Renewal Program Spending Optimization

WNH strives to achieve an optimal System Renewal Investment Plan by addressing those assets that are in the poorest health and have the largest potential impact of failure.

WNH has developed Asset Condition Assessment Frameworks that apply condition based metrics and targets to asset condition data to develop Health Index scores for each asset.

Where feasible, assets in the poorest condition ranked by their Health Index score are geospatially grouped into constructible projects. WNH also reviews inspection and maintenance data, repair history, seasonal or site specific impacts and the condition of related assets to develop a full assessment of the scope of the project and the renewal requirements. Potential projects are selected and prioritized based on the lowest overall evaluation.

Projects are then costed and the impact of failure for each project is calculated based on the total customer demand (kW) potentially impacted by the project. WNH then calculates the ratio of project cost to customer impact. This identifies projects that are most effective at reducing risk on an investment dollar basis.

The System Renewal spending is optimized by selecting projects that have the highest ratio of customer impact to project cost.

3.3.1.3. (5.3.3a bullet-2) WNH Inspection and Maintenance Programs

WNH asset condition assessments are based on well-established comprehensive inspection, testing and maintenance programs. These O&M programs have been developed and refined over time from manufacturers' recommendations, industry best practices, historical findings, WNH's past experience and prescribed requirements. These programs are executed at various times and by various means which are described further in this section. For the most part, asset condition assessment data is collected in electronic format. and then downloaded and reviewed. The asset register is updated and the data informs WNH's asset management process as described in **Section 3.1.2.3**, Primary Process Steps.

Generally, relatively simple, low-hazard level deficiencies are remediated at the time of inspection to eliminate a return trip. This may include replacement of broken guy guards or missing phase markers, replacement of missing signs etc.

Critical deficiencies presenting an imminent risk of asset failure, risk to public safety or reliability are also corrected at the time of inspection if possible. If not, they are reported to the Line Superintendent to schedule immediate corrective action.

The remaining deficiencies are reviewed and prioritized through WNH's proactive maintenance program which will prioritize corrective action based on cause, severity and hazard level. Recurring deficiencies are also identified and channelled into either an enhanced maintenance or capital replacement program.

3.3.1.3.1. WNH Inspection Programs

Requirements of the OEB's Distribution System Code (DSC) outline the minimum inspection standards and intervals required. Specifically, Table C-1 of the DSC identifies the maximum intervals for visual patrols, which for most urban facilities is 3 years, rural facilities is 6 years. For stations the intervals are 1 month, 6 months, 1 year or 3 years depending on the type of station. In addition, WNH has grid connected Transformer Stations which have inspection requirements identified in the OEB Transmission System Code.

WNH's service area is comprised of one urban area, serving the City of Waterloo, and two rural areas, serving the Township of Wellesley and the Township of Woolwich. WNH further divides its urban area into 3 equal parts and its total rural area into 6 equal parts as illustrated in **Figure 3.4**. These sections form the basis for WNH's implementation of systematic and routine visual patrols in compliance with the OEB minimum inspection requirements.

Each year WNH will inspect one urban and one rural section of its service territory. Visual patrols of the major distribution facilities, are comprehensive and the level of detail exceeds the patrol inspection requirements as defined in the Appendix C of the DSC.

Figure 3-4: WNH OEB Inspection Areas

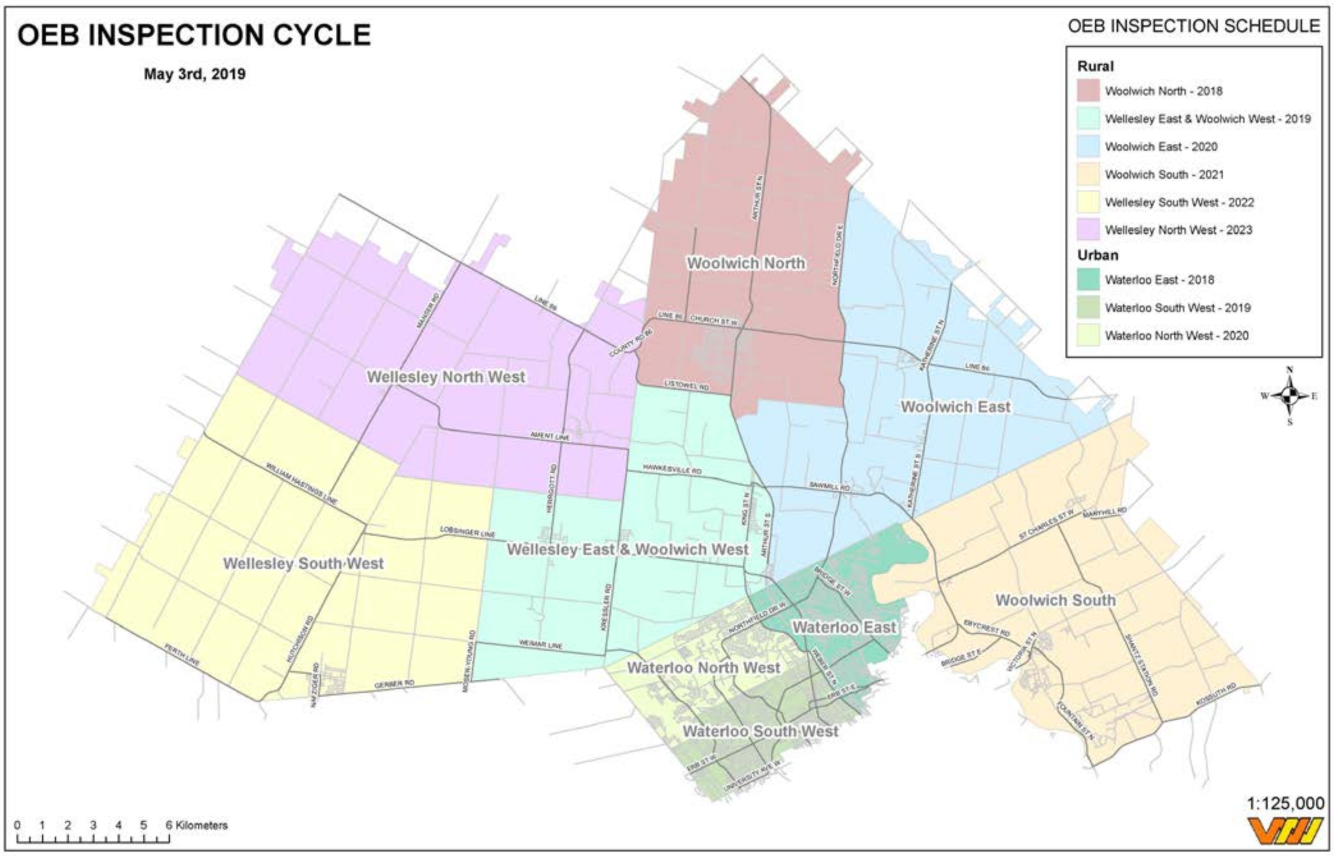


Table 3-5 to **Table 3-9** inclusive provides samples of WNH's inspection schedules.

Table 3-5: Inspections – Overhead and Underground Lines

OVERHEAD AND UNDERGROUND LINES	FREQUENCY
OEB Inspections (Urban)	3 year
OEB Inspections (Rural)	6 year
Inspection of major overhead crossings of Highway 85 Expressway	Annual
Inspections of overhead crossings of rivers and railways	Annual
Inspections of overhead and underground plant located adjacent to schools and playgrounds	Annual
Inspections of pole mounted capacitor banks	Annual
Infrared Thermography	Annual

Table 3-6: Inspections – Municipal and Rural Distribution Stations (DS)

DISTRIBUTION STATIONS INSPECTIONS	FREQUENCY
All Station Equipment (e.g. Transformers, switchgear, reclosers, capacitor banks, fencing, lighting, radio/RTU)	Monthly
Infrared Thermography	Annual

Table 3-7: Inspections – Transformer Stations (TS)

GRID CONNECTED TRANSFORMER STATION INSPECTIONS	FREQUENCY
All Station Equipment (e.g. transformers, switchgear, reclosers, batteries, fans & pumps, fencing, lighting, radio/RTU)	Monthly
Infrared Thermography	Annual

A) Inspection of Overhead Systems

WNH currently inspects approximately one-third of the urban region and one-sixth of the rural regions annually. The visual patrol serves as a condition-based assessment of overhead assets, including poles and their supports and attachments, pole-mounted distribution transformers, switches and other protective devices, conductor, grounding and surrounding vegetation. The inspection further serves to confirm the existence of other assets on the overhead distribution system such as third party communications equipment. Inspections are conducted by WNH PLMs or a qualified PLM contractor. Staff are provided with GIS based maps of the region and electronic tablets for identification and location of assets during the visual patrol. During the inspection, PLMs identify and record deficiencies or concerns regarding the condition of an asset. **Table 3-8** presents typical deficiencies, which may be routinely identified.

Table 3-8: Typical Overhead Deficiencies

ASSET	DEGRADATION FACTORS
Pole	Rotting, cracked, feathering, insect damage, leaning, wood pecker holes
Cross Arm	Rotting, twisted, bolt pulling through
Insulator	Flashed, broken, loose / tipped down
Arrester	Blown, flashed over
Switch	Loose, flashed over, porcelain insulators
Grounding	Not connected, exposed ground rod, damaged conductor
Guying	Loose, broken, damaged, anchor pulled, strain insulator broken
Guy Guard	Missing, cracked
Conductor	Frayed, broken strands, tie wire broken, corrosion
Cable Guard	Loose, exposed conductor, corrosion, grounding
Transformer	Rusted, leaking, cracked bushings, overheating
All	Vegetation / Overgrown, interference
All	Burning, tracking, lightning damage

Crossings

Inspections and condition assessments of all overhead circuits crossing major four-lane highways, railway lines and rivers are performed annually. The greater frequency reflects the greater risk that is associated with these parts of the distribution system. Crossings typically have longer spans and taller poles making them more susceptible to wind and ice loading damage. Along major roadways there is greater exposure to salt contamination and corrosion. River crossings also tend to be more remote making deterioration or storm damage less likely to be observed. All crossings are uniquely identified in WNH's GIS system. Their inspection process is the same as that described in the previous section.

Parks, Playgrounds & Schoolyards

The inspection of overhead line assets in or near parks, playground and schoolyards is performed annually. The greater frequency reflects the greater risk associated with children in these areas. Visible hazards such as broken ground wire, missing guy guards, damaged riser conduits, indications of tampering or climbing are identified. Such deficiencies are documented and remediated at the time of inspection if possible. Those deficiencies for which corrective action could not be immediately performed are addressed through WNH's proactive maintenance program.

Capacitors

Capacitor banks are visually inspected on an annual basis. PLMs look for signs of tracking, burning, tank swelling or overheating along with the condition and operation of fused switches and hot-line clamps. Those deficiencies for which corrective action could not be immediately performed are addressed through WNH's proactive maintenance program.

Load-Break Switches

All load-break switches on the WNH distribution system are inspected according to the DSC inspection requirements. PLMs identify switch deficiencies such as lightning damage overheating, burning, blade and mechanism operation, grounding and ground mat condition.

Those deficiencies for which corrective action could not be immediately performed are addressed through WNH's proactive maintenance program.

B) Inspection of Underground Systems

Unless otherwise noted the inspection frequency for underground systems is derived from Appendix C of the DSC whereby approximately one-third of urban area and one-sixth of rural area are scheduled to be inspected annually.

The visual inspections identify obvious structural/mechanical and hazardous conditions that may exist with accessible underground distribution system assets and the vegetation surrounding these assets. These assets include distribution transformers, switching cubicles and vault rooms. The data collection and reporting processes are the same as those previously described for the Overhead System Assets. **Table 3-9** presents typical deficiencies, which may be routinely identified.

Table 3-9: Typical Underground Deficiencies

ASSET	DEGRADATION FACTORS
Note (1)	The items below are in addition to the physical inspections all equipment receives for signs of damage, overheating, wear, tampering or vandalism.
Transformer (Tx)	Rusted, leaking, cracked bushings, overheating, misaligned with pad, locks
Tx Concrete Pad	Concrete deterioration, settlement or misalignment
Tx Below Grade Vaults	Concrete deterioration, settlement or misalignment, water, foreign materials, locks, vault lid security
Elbows & Bushings	Tracking, seating, cleanliness
Arrester (Elbow)	Blown, flashed over
Switches (Gas Insulated)	Tracking, flashover, seating, cleanliness
Switches (Solid Dielectric)	Tracking, flashover, cleanliness
Grounding	Connection, exposed ground rod, damaged or missing conductor
Conductor Terminator & Bushings	Tracking, jacket condition
All	Vegetation / Overgrown, interference
All	Burning, tracking, lightning damage

Distribution Transformers

WNH's underground distribution system incorporates mostly pad-mounted distribution transformers but also includes a small population of submersible transformers. In addition to the inspection frequency, WNH's condition assessments are also based on Appendix C of the DSC, as reflected in the reporting form, 'Inspection of Underground Transformer and Switching Units. This form provides a guideline for the condition assessment and allows for documentation of deficiencies (or lack thereof) concerning the physical condition, placement of pad, locks and locking mechanisms, grading, access changes, phasing indicators, nomenclature, inadequate signage, indications of tampering and internal/external apparatus such as cracked elbow connectors.

Switching Cubicles

As with distribution transformers, the frequency of inspection and condition assessments are based on the DSC's Minimum Inspection Requirements for switching kiosks and includes at a minimum, identification of deficiencies concerning paint, locking mechanisms, accessibility and the structure. The full list of deficiencies for which WNH, and more generally LDCs, should be aware is available in Appendix C of the DSC.

Vault Rooms

Inspection of vault rooms occurs on an annual basis and is performed in conjunction with infrared thermography. The greater frequency of inspection reflects the greater risk associated with vault rooms due to their location adjacent to or inside of buildings, near schools or higher traffic areas and the risk of exposure to energized equipment should unauthorized access be gained inside the vault room. Inspection points include those associated with transformers and switches in addition to accessibility, ventilation, overheating, rodent and water damage. Deficiencies with the vault room itself are reported to the building's owner who is responsible for all of the structural elements of the room. Deficiencies and condition assessments of the electrical equipment inform WNH's asset management plan.

C) *Inspection of Stations*

As with the overhead and underground distribution system, WNH performs comprehensive station inspections and condition assessments, the more important of which are described in **Table 3-10**.

Table 3-10: Typical Station Deficiencies

ASSET	DEGRADATION FACTORS
Note (1)	Every TS is somewhat unique in the equipment on site. Not all stations have the features listed below.
Note (2)	The items below are in addition to the physical inspections all station equipment receives for signs of damage, overheating, wear, tampering or vandalism.
Switchyard	Lightning & wind damage, insulator tracking, connections
Transformer	Oil level and temperature, winding temperature, bushings, fans, pumps, silica gel breathers, oil leakage, containment
Tap Changers	Operational counts, oil level, oil leakage
Switchgear	Audible signs of corona, SF6 gas pressure
Protections	Displays, flags,
Battery, Chargers, Inverters	Fluid levels, cell gassing, voltage
Building	Security, physical damage, water ingress, rodents
Grounding (all exposed)	Broken or missing conductor, overheating, connections
Auxiliary Equipment	Note (2)
Capacitor Banks	Audible signs of corona, connections
Site	Fence integrity, security cameras, soil erosion, vegetation management

Transmission Connected Transformer Stations

WNH incorporates the requirements of the OEB's DSC, Transmission Code, manufacturer recommendations, and industry best practices as the basis for its TS inspection program. Under the direction of the Protection & Control (P&C) Supervisor, TS inspections are performed by P&C Technologists on a monthly and yearly basis.

WNH has developed detailed inspection criteria to collect data and provide guidance during the monthly inspection process. All station equipment is inspected for signs of damage, deterioration, or tampering. Records of inspection are maintained electronically for asset registry purposes while reporting forms are largely paper-based.

All records of inspection are reviewed by the P&C Supervisor. The asset register is updated and the data informs WNH's asset management process as described in **Section 3.1.2.3**, Primary Process Steps. Critical deficiencies presenting an imminent risk of asset failure, risk to public safety or reliability are reported immediately and addressed through WNH's proactive maintenance program.

Distribution Stations

WNH incorporates the requirements of the OEB's DSC, manufacturer recommendations, and industry best practices as the basis for its DS inspection program. Under the direction of the P&C Supervisor, DS inspections are performed by P&C Technologists on a monthly and yearly basis.

Although these stations are smaller, they typically have the same major equipment as the transformer stations. **Table 3-10** provides a list of the typical inspection points at DS stations, although not all stations will have the same equipment. The inspection process is the same as described previously for the transformer stations.

3.3.1.3.2. WNH Maintenance Programs

WNH has an extensive maintenance program for its various assets. WNH employs three maintenance strategies in its programs.

A) Reactive Maintenance (RM)

When assets have failed or are found to be near failing during inspections, reactive maintenance becomes an option to employ in order to restore the asset to a safe and operable state. Normally unplanned and sporadic in nature, reactive maintenance is often associated with longer customer interruptions, collateral damage to nearby equipment and after hours call out of staff.

Reactive maintenance is aligned with the Asset Management strategy of Run-to-Failure which is used for equipment with low consequences of failure.

When assets have failed and reactive maintenance is not an option, Reactive Replacement of the asset is normally employed.

B) Preventative Maintenance (PM)

Preventative maintenance activities are schedule or time driven and are normally employed on assets where condition based monitoring is cost prohibitive, or feasible. Simple and low cost to set up, the preventative maintenance strategy is most commonly used at WNH. **Table 3-11** and **Table 3-12** provides a summary of WNH's preventative maintenance schedules for overhead and underground distribution lines.

C) Condition-Based (Predictive) Maintenance (CBM)

Condition-based or predictive maintenance is based on asset condition and is normally used on high value assets such as station equipment due to the cost of applying and asset monitoring equipment. CBM provides more timely condition information so that maintenance activities can intercede before failure occurs.

Table 3-11: WNH Maintenance Programs – Overhead Lines

OVERHEAD LINES	FREQUENCY
Load break switches (1/6 population)	Annual
Infrared Thermography	Annual
Pole Testing (fibre strength) approx. 10% of all poles > 30 years of age	Annual
Insulator Washing	Annual as needed

Table 3-12: WNH Maintenance Programs – Underground Lines

UNDERGROUND LINES	FREQUENCY
Pad mounted Switching Cubicles	Annual
Pad mounted Transformers	Annual
Infrared Thermography	Annual

In addition, WNH complies with inspection and reverification standards identified in the OEB Transmission Code for grid connected transformer stations.

D) <u>Maintenance of Overhead Systems</u>

Generally, deficiencies discovered during regularly scheduled inspections are corrected to remediate the deficiency either at the time of inspection, or as soon as possible following inspection. If further corrective action is required, or cannot be performed concurrently with the inspection, the Line Superintendent is notified to allow for the required lead-time to procure materials or coordinate with third parties. Additionally, corrective action to remediate minor deficiencies may also be performed during the visual patrol. This may include replacement of broken guy guards or missing phase markers. Remaining deficiencies are reviewed by the Line Superintendent and prioritized for corrective action.

All maintenance performed is documented for review and analysis by the Line Superintendent and archived. Through analysis of maintenance data (further elaborated below), recurring deficiencies may be identified and channeled into a capital program for asset replacement.

Assets in immediate need of maintenance or replacement are brought to the attention of the Line Superintendent

Crossings

The type of deficiencies found at crossings and the maintenance performed to remediate the deficiencies is no different than in other parts of the overhead distribution system. Crossings however are unique in the challenges they present to complete the work. River crossings have accessibility challenges due to terrain and seasonal conditions. Some require specialized equipment for access. Work on highway crossings can require extensive coordination of police and Ministry of Transportation (MOT) staff if road closure is required. Deficiencies are documented, reviewed by the Line Superintendent and prioritized for corrective action. Remediation is scheduled allowing time for coordination with appropriate authorities and seasonal conditions.

Parks, Playgrounds & Schoolyards

If possible, deficiencies are remediated during the time of the visual patrol. Corrective action is documented to allow for subsequent review and/or reporting. Remaining deficiencies are also documented, reviewed by the Line Superintendent and prioritized for corrective action. Critical deficiencies are reported immediately and typically remediated within one week, allowing for coordination with appropriate parties; non-critical deficiencies may be remediated in coordination with other maintenance programs.

Load-Break Switches

Preventative maintenance of load-break switches includes replacement of nomenclature, phase markers, arresters, replacing porcelain insulators with composite insulators and replacement or repair of switch components; also included is cleaning, lubrication and testing of switching operation. Preventative maintenance activities are documented on the appropriate reporting form, as well as surrounding or non-related deficiencies which required corrective action.

Preventative maintenance to address critical deficiencies is typically performed within 24 hours of the inspection and entails either refurbishment or complete replacement of the switch, depending on the nature of the deficiency. Refurbishment is the preferred methodology where peripheral or secondary components to the switch are critically deficient, for example a corroded connector with the potential to burn the line. In the event of extensive damage, the switch will need to be replaced. WNH has also implemented an annual program to replace the worst performing load-break switches, as found through inspection and maintenance activities.

Vegetation Management

Vegetation management, or tree trimming, is a preventative maintenance program scheduled on a 2 and 5-year cycle, where one of each of 2 urban zones and 5 rural zones of the distribution system is completed annually. This work represents approximately 80% of the annual vegetation management program. This activity is executed according to the previously established Ontario Hydro guidelines and completed by qualified contractors that have specialized knowledge of growth rates of various vegetation.

Approximately 20% of the annual program is comprised of reactive line clearing work to trim or remove trees in proximity to power lines, in response to storms, customer requests or as identified by WNH staff observations. Such requests are documented via customer request sheets or work orders and prioritized following an inspection. Vegetation that has caused an interruption is deemed critical and addressed immediately whereas tree growth with the potential to cause an outage is addressed within one week. WNH takes additional preventative maintenance initiatives in their vegetation management program including tree-trimming during the implementation of capital build/rebuild projects.

Infrared Thermography

Infrared (IR) thermography is completed annually on the three phase portion of the overhead distribution system by a qualified contractor. This non-destructive, non-invasive condition assessment of three-phase conductors, primary and secondary connections, and tie-points at distribution equipment allows for deficiencies (thermal anomalies) to be identified. Throughout this process, severe thermal anomalies, representing dangerous overheating with potential to disrupt supply or damage equipment, are reported on a daily basis to the Line Superintendent. Critical deficiencies are generally remediated within 24 to 48 hours, allowing for customer and/or outage coordination where applicable.

A summary report, following completion of IR thermography, is prepared and outlines fault locations, severity of the fault (prioritized based on thermal anomaly) and notes and recommendations. In addition to the severe thermal anomalies previously identified, the report also identifies intermediate and minor hot spots. Maintenance to address the faults, as noted in the report, is subsequently prioritized and scheduled based on potential impact of failure and fault severity (temperature rise above ambient temperature). Remediation work may be grouped together based on deficiency location as a cost savings measure. All anomalies are remediated within the calendar year in which they were first identified. The Line Superintendent subsequently documents the date of remediation on the original summary report.

Insulator Washing

Insulator washing is typically performed annually on 27.6 kV and 44 kV insulators in areas known to have high salt contamination, for example at expressway crossings, as identified through previous washings and general reporting. The frequency of insulator washing may be prompted by other environmental factors such as industrial contamination.

Insulator washing is performed by a qualified contractor who, during the washing, will also report general insulator concerns such as broken or damaged insulators. Because of the contractor's experience and qualifications, they are able to prioritize deficiencies whereby critical concerns, such as those resulting in an outage, are immediately reported to WNH's Control Room and internally remediated within 24 hours. Less critical damage is reported to the Line Superintendent and remediated within one week.

Pole Testing

WNH has a Wood Pole Testing Program in place whereby poles are tested for baseline fibre strength. Poles chosen for testing are determined by age, risk to public safety and potential impact on system reliability. GIS produced maps are provided to qualified testing contractors to identify and locate the poles to be tested. Results are provided in an electronic database, analyzed and determinations made as to the action required. On average WNH annually tests approximately 10% of the wood pole population greater that 30 years of age.

Poles with remaining fibre strength less than 50% are scheduled for immediate replacement. Depending on the location of the pole and complexity of the work, replacement may take from several days to several weeks.

Poles with remaining fibre strength between 50% and 60% are normally scheduled to be replaced in within the next 12 - 24 months. If the replacements can be combined into larger constructible projects or added to an existing planned project, WNH will perform a detailed structural analysis on the poles to determine if they can remain in service for up to an additional 24 months. This improves design and construction efficiency while providing an opportunity to upgrade to current standards. Poles that can be replaced like-for-like will normally be replaced within the current or following budget year.

Poles with remaining fibre strength between 60% and 75% are scheduled to be retested in 3-5 years. During the testing procedure a detailed visual inspection is also completed. Serious observed defects may require replacement of the pole regardless of the fibre strength testing results.

Poles with remaining fibre strength greater than 75% are scheduled to be retested in 5 years if > 35 years of age, 10 years otherwise.

This pole testing program is in addition to the general patrol and inspection of the overhead system previously noted. Inspection and testing data is archived for analysis and development of future inspection programs.

E) Maintenance of Underground Systems

Distribution Transformers

While maintenance is performed on padmount and submersible distribution transformers during inspections, it is generally limited to renumbering elbow tags for visibility, installing new exterior or interior nomenclature where absent or remediation of critical deficiencies, provided this can be done safely at the time. Where such remediation of critical deficiencies cannot be done, due to outage coordination requirements with a customer for example, corrective action is scheduled for the earliest opportunity; until then, the distribution transformer is secured.

Deficiencies are prioritized by the Line Superintendent and scheduled along with other corrective maintenance work. Corrective action is documented and archived. Through analysis of maintenance data, recurring deficiencies may be identified and channelled into a capital program, as required, for asset replacement.

Switching Cubicles

Remediation of critical deficiencies involving access and security such as temporarily securing lids with broken hinges or locks, are performed at the time of inspection to provide adequate safety and/or reliability until replacement can be coordinated. Deficiencies of a lower priority, as identified during the inspection and condition assessment, are documented and further archived within the inspections database. A report of outstanding deficiencies is subsequently prepared whereby deficiencies are categorized according to the corrective action required and channelled into maintenance programs for rehabilitation, such as painting, or into a capital program for replacement.

Vault Rooms

Deficiencies specific to vault rooms are documented and reported to the Line Superintendent for prioritization and remediation, typically as soon as possible allowing for coordination and outage scheduling. Deficiencies involving security such as door and lock conditions are dealt with immediately.

Infrared Thermography (IR)

IR thermography on the underground distribution system is completed annually in conjunction with the overhead system and includes identification of thermal anomalies in transformer vault rooms, pad-mounted transformers and switching cubicles, and underground risers.

As with the IR thermography of the overhead system, severe deficiencies presenting an immediate safety or reliability concern are reported on a daily basis to the Line Superintendent and remediated within 48 hours, or at the earliest opportune time, allowing for outage coordination where required. Following a review of the summary report outlining IR thermography activities and thermal anomalies, corrective action to remediate intermediate and minor deficiencies is prioritized and scheduled based on the severity of a deficiency.

F) Maintenance of Substations

WNH has well established and comprehensive preventative and condition-based maintenance programs that provide the basis for condition assessment and remediation, with respect to Transformer Stations and Distribution Stations. In addition to satisfying the reporting requirements of the OEB's DSC, the IESO mandates additional requirements for grid connected Transformer Stations that are met by WNH.

Deficiencies that have been identified during the inspection and condition assessment of stations are documented and categorized as critical or non-critical, whereby the former impact health/safety and reliability, and the latter have the potential to impact these items or the equipment itself. Critical or non-critical minor deficiencies may be remediated during the inspection, provided materials are on-hand or as warranted. Those not remediated at the time are subsequently reviewed by the P&C Supervisor and compiled into a single deficiency list. Critical deficiencies are addressed at the earliest opportunity, accounting for material lead-times or outage coordination. Conversely, non-critical deficiencies are addressed within one year or coordinated with preventative maintenance activities for the station to mitigate outage time, if required. Following remediation, specific information about corrective action taken and the completion date is documented.

The decision of whether corrective action is best exercised through maintenance or capital replacement is made through analysis by the P&C Supervisor and the Stations Engineering Supervisor. The majority of results and actions are recorded in electronic format as P&C Technologists utilize laptops during preventative maintenance.

These programs provide for continuous system improvement and performance reliability, ensuring long term capacity, supply availability and reliability to meet customer demands. These programs further contribute to the effective and successful management of these assets.

Table 3-13 and **Table 3-14** provide a summary of major components and intervals of planned maintenance on TS and DS assets.

Table 3-13: WNH Maintenance Programs – Stations (TS)

	INTERVAL				
TRANSFORMER STATION MAINTENANCE	1 YEAR	2 YEAR	4 YEAR	5 YEAR	10 YEAR
Transformer & Line Switches			X		
Bus					X
Protections Transformer/Line/CBF		X			
Bus Protections		X			
Bank and Tie Breakers		X			
Feeders (breakers/cables/protections)			X		
Battery Banks	X				
Sustained Alarms		X			
Full SCADA Check		X			
IR Thermography	X				
Transformer Oil Testing (DGA & Oil Condition)	X				
Painting					X
Vibration Analysis (Tx oil cooling fans and pumps)	X				

Table 3-14: WNH Maintenance Programs – Stations (DS)

TRANSFORMER STATION (DS) MAINTENANCE	INTERVAL				
	1 YEAR	2 YEAR	4 YEAR	5 YEAR	10 YEAR
Transformers & Line Switches				X	
Bus Inspection					X
Station 24/48 Battery Banks	X				
Breakers / Reclosers/ Protections				X	
Capacitor Banks & Switches				X	
SCADA/Local Alarms		X			
Feeders				X	
Transformer Oil Testing (DGA & Oil Condition)	X				
IR Thermography	X				
Painting					X

Although WNH follows IESO mandated fixed maintenance frequencies with TS assets, WNH also utilizes condition-based parameters for a predictive maintenance approach. These parameters include;

- transformer online dissolved gas analysis, oil condition;
- tap changer oil condition, vibration analysis, operations counter
- cooling pumps & fans vibration analysis

Infrared Thermography

IR thermography of all stations is completed annually and coordinated with thermography of the overhead and underground distribution system, following the IR processes previously described for preventative maintenance on the overhead and underground system. Following the IR thermography inspection, a report is produced outlining inspection activities, thermal anomalies and recommendations. The report is reviewed by the P&C Supervisor and recommendations may be implemented for remediation of anomalies or, if more extensive, coordinated with Stations Engineering

Vegetation Management

Vegetation control around transformer stations, rural distribution stations and transformer enclosures is carried out annually under the direction of the P&C Supervisor by WNH stations staff or a qualified contractor. The main activities consist of the control of vegetation in the station granular material to reduce step potential hazards, the prevention of climbing access into station yards and the creation of clear sight lines along station fence lines for security reasons.

Insulator Washing

Insulator washing is typically performed on selected 27.6 kV and 44 kV station structures in areas known to have high salt contamination (mostly from roadway spray), as identified through previous inspections. The work is coordinated with the annual overhead lines insulator washing program.

Vibration Monitoring

In addition to regular visual inspections, WNH performs annual vibration analysis to assess the condition of oil cooling fans and oil circulation pumps associated with grid connected transformers. Vibration analysis aids in the prediction of impending failures that can directly lead to derating of the transformers. WNH contracts this specialized work with a third party. A report is produced outlining anomalies and recommendations. The report is reviewed by the P&C Supervisor and recommendations may be implemented for remediation of anomalies or, if more extensive, coordinated with Stations Engineering.

Transformer Oil Testing

Transformer oil condition and dissolved gas analysis (DGA) is performed on all power substation transformers on an annual basis. Oil sampling is coordinated by the P&C Supervisor using internal staff. WNH contracts the specialized work of oil testing and analysis with a third party. A report is produced outlining anomalies and recommendations. The Stations Engineering Supervisor reviews the report and provides direction for remediation of anomalies.

3.3.1.4. (5.3.3a bullet-3a) Asset Replacements Prioritized and Scheduled to align with Budget Envelopes

WNH's Processes, Tools and Methods used to identify, select, prioritize and pace the projects/programs is provided in **Section 4.2.2**.

Initial annual budget envelopes are based on historical and planned expenditures. Annually, capital investment plans are constructed from the ground up based on the most current customer requirements, asset condition, distribution system performance, and corporate business needs. **Section 4.2.2** describes WNH's capital planning process in detail. **Figure 3-1** illustrates WNH's Asset management and Capital Expenditure Process workflow.

After completing the prioritization process, the portfolio of selected projects is compared to the budget envelope. WNH then goes through an iterative process to examine its ability to resource and finance the plan and the impact on customer bills.

If the planned expenditures are greater than the budget envelope, WNH examines the risk of deferring projects into later years and possibly creating a greater risk and liability in future expenditures. The option of increasing the budget envelope is also examined with an analysis of bill impacts for all customer classes at the distribution, delivery and total bill level.

Conversely, if planned expenditures are less than the budget envelope, projects from future years may be pulled forward if it assists in the pacing of overall capital plan expenditures. Alternatively, if all available resources are committed, WNH may go forward with a lower capital budget.

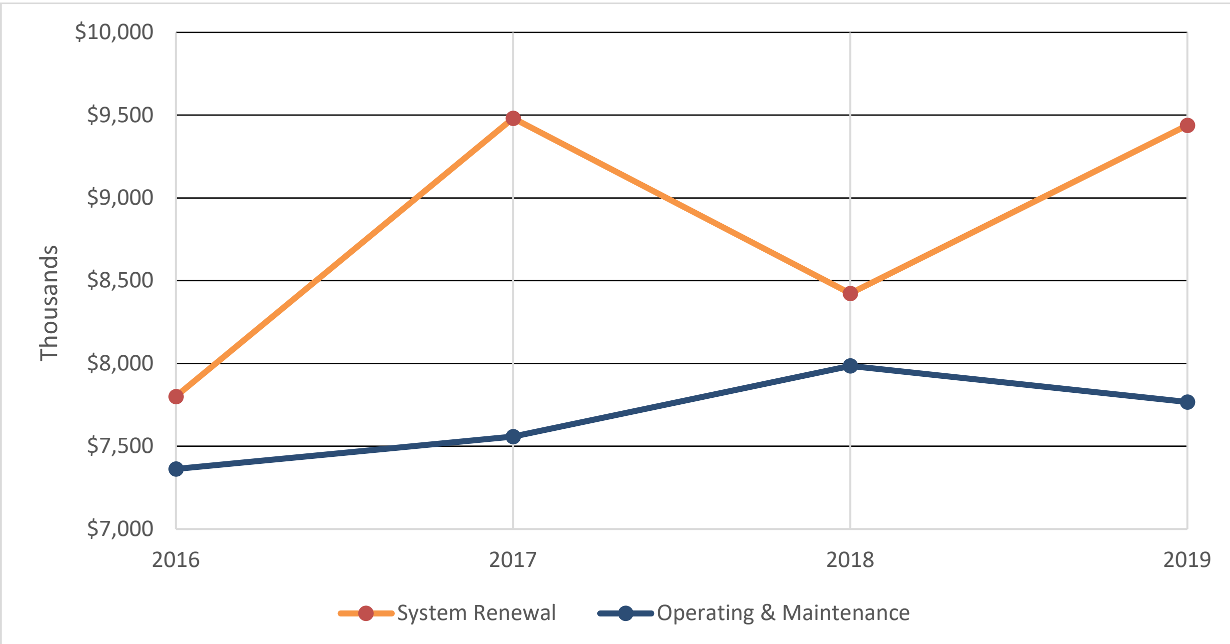
There may be several iterations of examining the aforementioned options before a final budget envelope and investment plan is approved by the WNH Executive. The output of this stage is a one-year capital budget with project detail and a five-year capital expenditure plan with allocation of funds to each major budget and investment category.

The investment plans are then brought forward to the WNH Board of Directors for review and approval.

3.3.1.5. (5.3.3a bullet-3b) Impact of System Renewal Investments on Routine O&M

Figure 3-5 illustrates WNH's historical expenditures in System Renewal against total O&M.

Figure 3-5: System Renewal vs O&M Expenditures



WNH does believe that over the long term, System Renewal investments do help moderate the rise in routine O&M costs. Replacing assets in poor condition with new assets defers some of the near term maintenance costs into the future; however, the annual amount of assets replaced typically represents only a fraction of the existing asset base. In the short term, it is difficult to quantify any reduction in maintenance costs due to System Renewal investments and inspection costs remain unchanged. From **Figure 3-5** it can be seen that over the short term both maintenance and System Renewal expenditures have increased. Any incremental savings tend to be absorbed by inflationary cost increases. Also to be considered is the significant portion of asset base remaining that continues to age and deteriorate, attracting incremental increases in maintenance costs.

Asset additions that result from System Access and System Renewal investments add to the work load of inspection and maintenance programs placing additional upward pressure on O&M expenditures, and making it again difficult to quantify any reductions due to System Renewal investments alone.

Over the historical period, WNH’s O&M costs increased on average by 2.1% annually. This is not unexpected as inflationary pressures, as noted by a CPI average of 1.81% (2016 – 2019), and growth in the asset base continued to place upward pressure on O&M costs.

3.3.1.6. (5.3.3a bullet-4) Maintenance Planning Criteria and Assumptions

WNH planning criteria and assumptions are discussed in **Section 3.3.1.3.2** WNH Maintenance Programs.

3.3.2. (5.3.3b) Description of asset life cycle risk management policies and practices

- *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, type of information inputs and outputs, and how conclusions of risk analyses are used to select and prioritize capital expenditures.*

In business, there are four strategies WNH uses to deal with risk: avoidance, acceptance, transference, and reduction are all used in varying degrees. WNH considers the cost of the risk mitigation strategies and the risk it is willing to accept before selecting and prioritizing the projects.

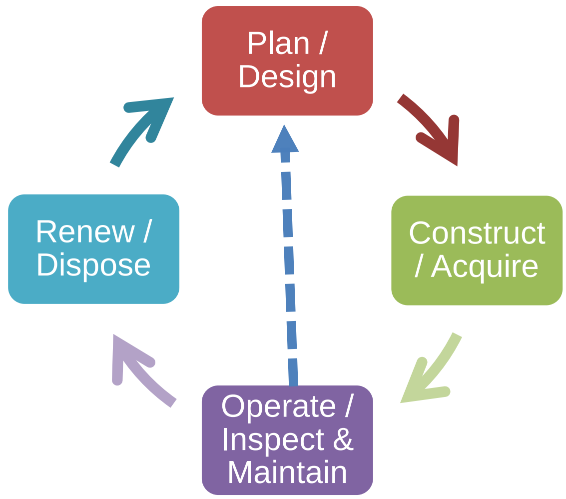
In asset lifecycle risk management, Risk Acceptance, or run-to failure is a strategy used mainly for low value, low risk distribution assets where like-for-like replacement is possible and incidents of failure are low. When incidents of asset failure accelerate or cluster and become a cause for concern, a switch to a proactive replacement strategy is employed. Assets commonly run to failure include distribution transformers, pole line hardware, lightning arrestors, meters, underground cable in duct.

Risk Avoidance is achieved by utilizing good purchasing specifications and design and construction practices. Risk Transference is achieved by incorporating liability and warranty requirements in procurement documents. Both of these strategies are more common and detailed with higher value assets such as underground primary trunk feeder cable and stations equipment.

The most commonly used mitigation strategy in asset lifecycle risk management is Risk Reduction. All assets carry with them an inherent risk of failure which increases over time as asset conditions deteriorate and the probability of failure correspondingly increases. Risk can never be completely eliminated; however, WNH's policies and practices reduce overall risk by taking incremental steps throughout all stages of the asset lifecycle process.

The major steps involved in the life cycle of an asset are illustrated in **Figure 3-6**.

Figure 3-6: WNH Asset Lifecycle Process



Plan / Design

The first step in risk management occurs in the planning and design stage.

WNH designs to robust standards such as CSA C22.3 No. 1-10–Overhead Systems Standard, Heavy Weather conditions that assist overhead lines withstand inclement weather conditions and climate change. WNH also utilizes USF design standards, guidelines for asset inspection, joint use, non-linear pole loading analysis, and tendering. Working in partnership with the 53 USF member utilities improves the expertise of WNH's design capabilities.

WNH utilizes analytical software such as for load flow, voltage regulation and pole loading to provide more detailed planning and improve designs. These inherently result in a more robust distribution system that is less prone to asset failure.

In its design process where practical, WNH selects asset locations with less possibility of damage or failure due to foreign interference and where equipment can be easily accessed and maintained.

WNH's planning and design policy is to incorporate looped or interconnect points throughout the distribution system so that when assets do fail, an alternate supply of power is available. This reduces the consequences of failure as only a minimum number of customers need to wait for repairs before power is restored.

Construct / Acquire

WNH uses detailed purchasing specifications, especially for high valued assets. Specifications reduce the risk of inferior material or workmanship being introduced into WNH's asset base.

In key areas and where economically feasible, WNH specifies equipment with higher ratings to be able to withstand greater stresses and last longer. Examples include; higher equipment BIL ratings on overhead line post insulators and distribution transformers to provide added protection against lightning, and 13.8 kV underground cable with 28 kV insulation for greater longevity. It is also more cost effective to purchase and inventory only 28 kV rated primary cable and accessories than to have both 15 kV and 28 kV.

Ensuring adherence to approved material, design and construction standards inherently reduces asset and public safety risk. WNH inspects all major construction for deficiencies or adherence to design standards. WNH has an excellent record with ESA in compliance to Ontario Reg. 22/04 and has received a clean audit every year over the historical period. This regulation establishes a standard for safety performance that affects electrical safety requirements for the design, construction, and maintenance of electrical distribution systems owned by licenced distributors.

Operate / Inspect & Maintain

During the operational phase of an asset's lifecycle, WNH uses a systematic approach of inspections, condition and age assessment, data analysis, inspections and maintenance to identify and mitigate risk to its assets. Inputs to WNH's AMP include.

- Condition data
- Age and life expectancy
- Operational performance (reliability)
- Maintenance or remediation activity

Data collection is ongoing and maintained in an asset register. Regular review and analysis of asset data health and performance reveals increasing risks of asset failure. Analysis also informs the Renew / Dispose stage by helping develop trending data to estimate asset EOL. Assets with a high risk of failure and large associated impacts are prioritized for replacement. Immediate risks of failure are mitigated through short term plans which include additional maintenance and proactive replacement; whereas, longer term risks are managed through System Renewal plans.

When assets prematurely fail, WNH investigates the root cause of failure which could be material, manufacturing, design or construction related. Lessons learned are used to inform and improve WNH's other processes and lower the risk of reoccurrence.

Reactive Renewal expenditures have decreased over the historical period; indicative of fewer assets having to be replaced under failed conditions.

Renew / Dispose

Review and analysis of asset data health and performance at EOL informs the planning and design stage and helps improve the next cycle of asset additions or replacements. Lessons learned and the resulting improvements in asset lifecycle management inherently support WNH's overall risk reduction strategy.

3.4. (5.3.4) System Capability for REG

- *This section provides information on the capability of a distributor's distribution system to accommodate REG, including a summary of the distributor's load and renewable energy generation connection forecast.*
- *a) Applications from renewable generators over 10 kW for connection in the distributor's service area.*

Please refer to DSP **Section 1.3.9** Embedded Generation, Table 1-14.

- *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 IESO 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 must be provided).*

Please refer to DSP **Section 1.3.9** Embedded Generation, Table 1-14.

- *c) The capacity (MW) of the distributor's distribution system to connect renewable energy generation located within the distributor's service area.*

TRANSFORMER STATION / FEEDER						
Station	Feeder(s)	Owner	Total Generation Capacity (MW)	Connected Generation (MW)	Remaining Generation Capacity (MW)	Remaining Generation Capacity (%)
Rush		WNH	12.9	0.7	12.2	94%
Scheifele A (1)		WNH	4.4	4.4	-	0%
Scheifele B (2)		WNH	27.5	3.5	24.0	87%
WNH MTS #3		WNH	18.3	2.7	15.6	85%
Elmira TS		HONI Tx	25.0	7.0	18.0	72%
Preston TS	21M25	Energy+	8.6	0.4	8.2	96%
Fergus TS	73M7	HONI Dx	4.8	0.4	4.4	91%
KWH #9	9M4	KWHI	3.6	0.9	2.7	75%
Total			112	20	85	76%

- *d) Constraints related to the connection of renewable generation, either within the distributor’s system or upstream system (host distributor and/or transmitter)*

Please refer to **Appendix H** - WNH Renewable Energy Generation (REG) Investment Plan, Sections 5 and Section 6.

- *e) Constraints for an embedded distributor that may result from the connections*

WNH currently has only one embedded distributor. There have been no constraint’s identified that may result from the connections.

All information is current as of December 31, 2019.

4. (5.4) CAPITAL EXPENDITURE PLAN

This section describes WNH's capital expenditure plan over the five-year forecast period 2021 – 2025. This section is organized to follow the requirements of OEB Chapter 5, Section 5.4.

This section includes the following;

1. A summary of the capital expenditure plan including;
   - a description of customer engagement activities (5.4a);
   - a description of how the distribution system will develop over the next five years (5.4b);
2. Capital expenditure planning process overview (5.4.1, a - f)
   - Rate funded activities to Defer Distribution Infrastructure (5.4.1.1, a - d)
3. Capital expenditure summary (5.4.2)
4. Justification of capital expenditures (5.4.3)
   - Overall plan (5.4.3.1)
   - Material investments (5.4.3.2, A - C)

4.1. (5.4) Summary

4.1.1. (5.4) Capital Expenditures over the Forecast Period

This section sets out WNH's proposed capital expenditure plan for distribution system and (non-system) general plant covering the 2021 to 2025 planning period. A detailed overview of capital expenditures in the 2021 Test Year can be found in **Section 1.4.3** of this DSP and detailed program materiality sheets can be found in **Appendix B** - 2021 Material Capital Investments.

For comparison purposes, historical information is provided in **Table 4-1** and **Figure 4-1**. Overviews of forecast capital expenditures are provided in **Table 4-2** and **Figure 4-1**.

Exceedances in capital expenditures and contributed capital in 2016 were as a result of the unplanned increase in the scope of work required by the Waterloo Region Light Rail Transit (LRT) project: a System Access relocation project, WNH was obligated to follow the LRT's required scope of work and schedule. WNH had also negotiated a relatively high rate of recovery (72%) for capital expenditures for the LRT project which increased capital contributions in both 2016 and 2017.

Table 4-3 provides a comparison of forecast to historical annual average capital expenditures. WNH believes that a comparison of forecasted expenditures to those during the 2017–2020 time frame is more indicative of WNH's normal investment plans.

With the exception of 2016, historical annual capital expenditures averaged between $18.4 million and $19.9 million. Forecast annual capital expenditures are expected to range from $19.0 million to $20.7 million. **Figure 4-2** illustrates that the percentage of investment in each of the four investment categories remains similar between the historical period and forecast periods.

Table 4-1: Summary of 2016 - 2020 Capital Investments by OEB Category

OEB Investment Category	Historical Period				Bridge Year	Average Annual Investment	% Average Annual Investment
	2016	2017	2018	2019	2020	2016-2020	2016-2020
System Access	$17,628,164	$6,298,503	$6,091,460	$6,243,182	$5,839,159	$8,420,094	39%
System Renewal	$7,801,178	$9,481,900	$8,423,589	$9,438,714	$8,612,076	$8,751,491	41%
System Service	$1,742,066	$566,843	$1,822,412	$2,449,054	$2,198,991	$1,755,873	8%
General Plant	$2,288,204	$2,264,671	$2,030,139	$1,810,228	$3,554,579	$2,389,564	11%
Totals	$29,459,613	$18,611,917	$18,367,600	$19,941,178	$20,204,805	$21,317,023	100%
Contributed Capital	$12,636,204	$4,578,501	$2,968,930	$2,110,939	$2,065,806	$4,872,076	23%
Net CAPEX	$16,823,409	$14,033,416	$15,398,670	$17,830,239	$18,138,999	$16,444,947	
O&M	$7,362,820	$7,558,307	$7,985,117	$7,766,704	$7,907,049	$7,715,999	

Historical O&M costs increased on average by 1.9% annually between 2016 and 2019. Details on historical unit cost metrics for capital expenditures and O&M can be found in **Section 2.3.7**

Historical capital expenditures increased on average by 2.9% annually between 2017 and 2020. The comparison of forecast O&M and capital expenditures are illustrated in **Figure 4.1**.

Table 4-2: Summary of 2021 - 2025 Capital Investments by OEB Category

OEB Investment Category	Test Year	Forecast Period				Average Annual Investment	% Average Annual Investment
	2021	2022	2023	2024	2025	2021-2025	2021-2025
System Access	$ 5,840,262	$ 6,166,099	$ 6,305,421	$ 6,447,529	$ 6,592,480	$ 6,270,358	31%
System Renewal	$ 8,095,769	$ 9,371,995	$ 9,548,434	$ 9,693,203	$ 9,951,367	$ 9,332,154	47%
System Service	$ 2,293,605	$ 1,346,209	$ 1,288,333	$ 1,211,460	$ 1,211,589	$ 1,470,239	7%
General Plant	$ 2,818,876	$ 3,567,432	$ 3,593,891	$ 2,062,637	$ 2,221,975	$ 2,852,962	14%
Gross CAPEX	$ 19,048,512	$ 20,451,734	$20,736,079	$ 19,414,828	$ 19,977,411	$ 19,925,713	100%
Contributed Capital	$ 2,642,394	$ 2,709,839	$ 2,764,036	$ 2,819,317	$ 2,875,703	$ 2,762,258	14%
Net CAPEX	$ 16,406,118	$ 17,741,894	$17,972,043	$ 16,595,512	$ 17,101,708	$ 17,163,455	
O&M	$ 8,213,832	$ 8,378,108	$ 8,545,670	$ 8,716,584	$ 8,890,916	$ 8,549,022	

Figure 4-1: Historical and Forecast Capital Expenditures and O&M

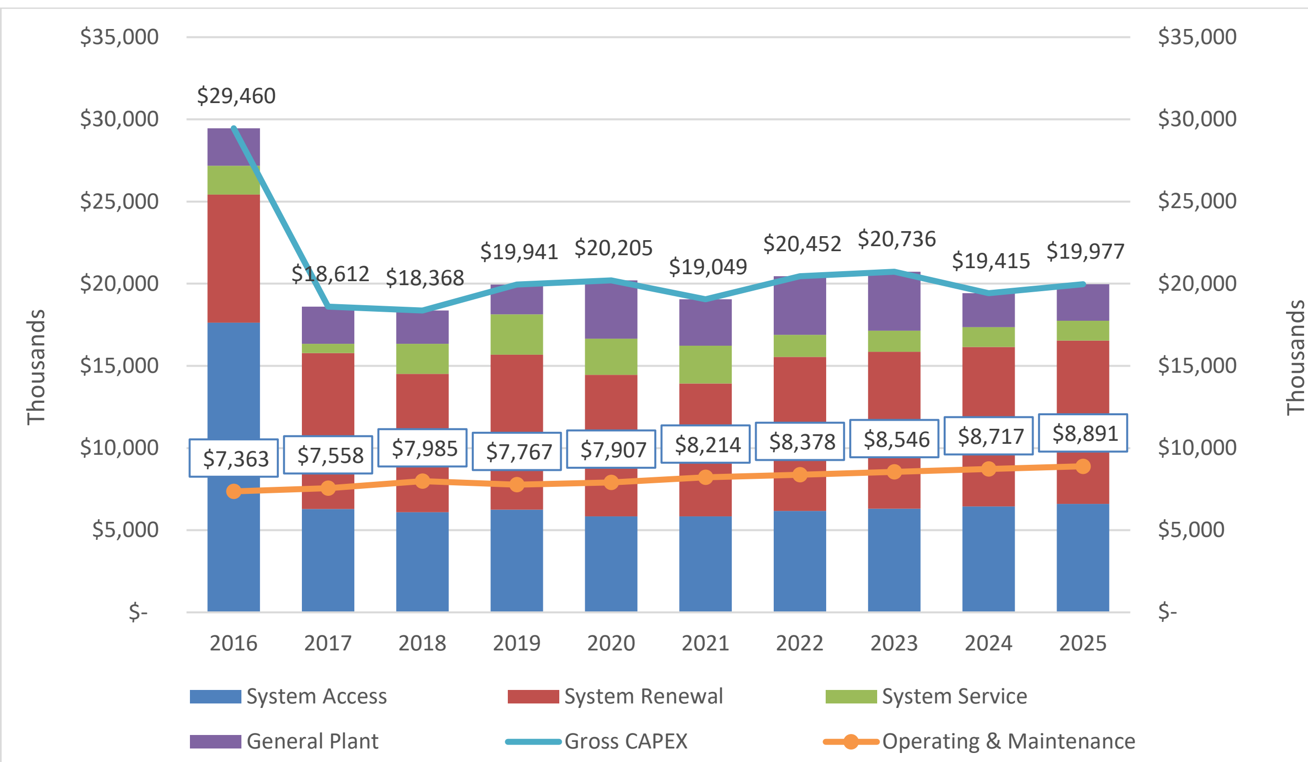


Figure 4-2: Historical and Forecast Capital Expenditures (%)

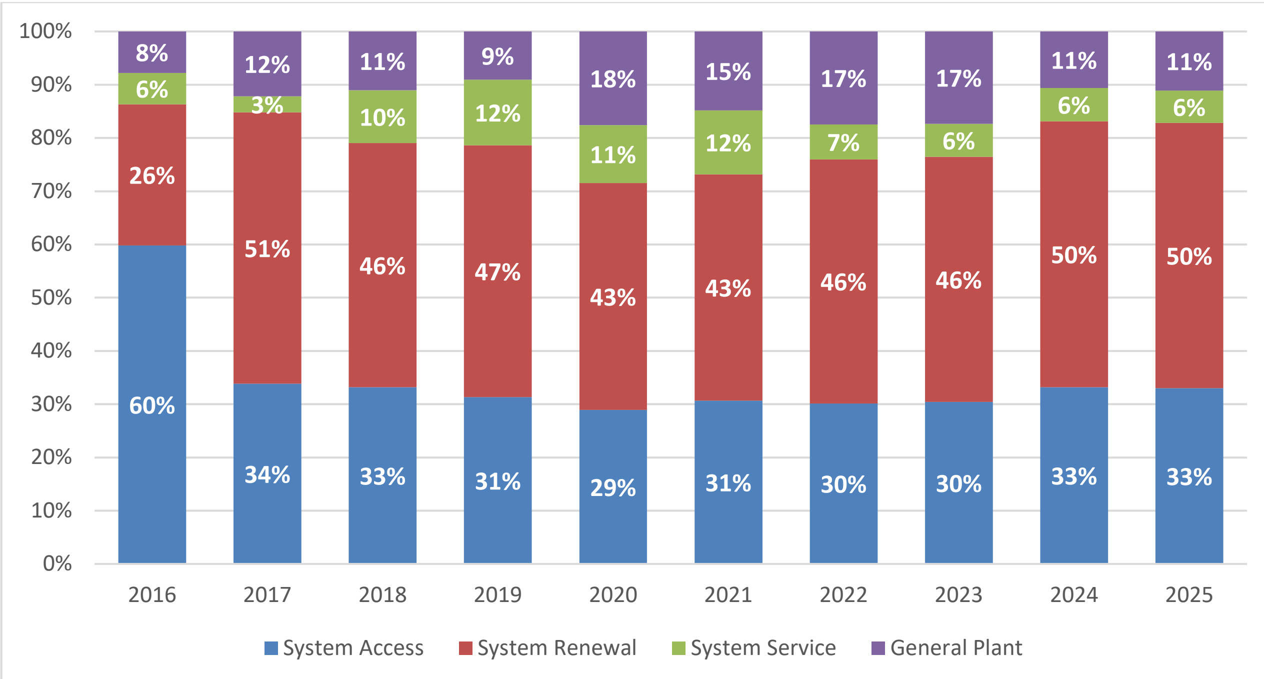


Table 4-3: Historical vs Forecast Capital Investments

OEB Investment Category	Annual Historical Average	Annual Historical Average(1)	Annual Forecast Average	Annual Forecast - Historical (2016)	% Average Annual Investment (2016)	Annual Forecast - Historical (2017)	% Average Annual Investment (2017)
	2016 - 2020	2017 - 2020	2021 - 2025	Variance	Forecast / Historical	Variance	Forecast / Historical
System Access	$ 8,420,094	$ 6,118,076	$ 6,270,358	$ (2,149,736)	-25.5%	$ 152,282	2.5%
System Renewal	$ 8,751,491	$ 8,989,070	$ 9,332,154	$ 580,662	6.6%	$ 343,084	3.8%
System Service	$ 1,755,873	$ 1,759,325	$ 1,470,239	$ (285,634)	-16.3%	$(289,086)	-16.4%
General Plant	$ 2,389,564	$ 2,414,904	$ 2,852,962	$ 463,398	19.4%	$ 438,058	18.1%
Gross CAPEX	$21,317,023	$19,281,375	$19,925,713	$ (1,391,310)	-6.5%	$ 644,338	3.3%
Contributed Capital	$ 4,872,076	$ 2,931,044	$ 2,762,258	$ (2,109,818)	-43.3%	$ (168,786)	-5.8%
Net CAPEX	$ 16,444,947	$ 16,350,331	$17,163,455	$ 718,508	4.4%	$ 813,124	5.0%

WNH is forecasting O&M expenditures to increase by 2.0% annually between 2021 and 2025. Capital expenditures are forecasted to increase on average by 1.2% annually between 2021 and 2025. The comparison of forecast O&M and capital expenditures is illustrated in **Figure 4.1**.

The forecast in System Access expenditures reflect WNH's belief that the investment drivers for this category will remain substantially unchanged over the forecast period.

The increase in System Renewal expenditures reflects the increase in assets reaching end-of-life and requiring replacement as identified by WNH's Asset Condition Assessment program.

The reduction in System Service expenditures is reflective of WNH having made many of its larger planned Grid Modernization investments during the historical period and that investments over the forecast period reflect a more moderate pace aligned with system growth and customer expectations.

The increase in General Plant expenditures is almost entirely due to WNH's planned replacement of its ERP system.

WNH also forecasts a reduction of contributed capital compared to the forecast period. This forecast is based on historical trends and the expected mix of capital projects that attract capital contributions.

4.1.2. (5.4a) Customer Engagement Activities

- *A description of customer engagement activities to obtain information on their preferences and how the results of assessing this information are reflected in the capital expenditure plan.*

Description of customer engagement activities

Please refer to **Section 2.2.1.1**

Results reflected in the capital expenditure plan

Please refer to **Section 2.2.1.1**

4.1.3. (5.4b) System Development over the Forecast Period

- *A description of how the distributor expects its system to develop over the next five years, including in relation to load and customer growth, climate change adaptation, grid modernization and/or the accommodation of forecasted REG projects.*

Load & Customer Growth

WNH has forecast an annual growth of 1.0% in its summer peak demand and 0.2% in its winter peak demand. WNH has forecast customer growth to continue over the next 5 years at an annual rate of 0.7%.

WNH does not anticipate any constraints on overall supply or the ability to connect new load and generation customers over the forecast period. Some localized constraints within the distribution system may exist and will be addressed on a case by case basis.

Climate Change Adaption

Climate change is expected to bring on more severe and frequent inclement weather. The impacts of most concern for WNH and its distribution system include ice and wind damage to overhead lines and increased flooding of below-grade transformers and switchgear equipment due to prolonged rainfall.

WNH's System Renewal program replaces assets that are old and in poor condition allowing the distribution system to be better able to withstand poor weather conditions. Compared to the assets being removed from service, new assets incorporate higher design standards and stronger materials.

WNH forecast projects include replacement of overhead lines and underground distribution with below grade transformers and vaults, all in poor condition or with high risk of failure. Investments in Grid Modernization projects also allows WNH to have improved response and flexibility to better minimize the impact to customers when severe weather events do interrupt power.

On the operating side, robust programs such as proactive tree trimming, inspection and maintenance programs help to minimize problems when weather events do occur.

These activities are all included in WNH's DSP.

Grid Modernization

Over the next 5 years, WNH's distribution system will see continued investments in the deployment of advanced distribution system management devices and technologies. SCADA connected switchable devices and fault indicators, enhanced distribution protection relays, expansion of self-healing networks, and advanced communications infrastructure to support these technologies will be implemented. These investments are focused on reliability and capacity utilization improvements.

Functional Obsolescence

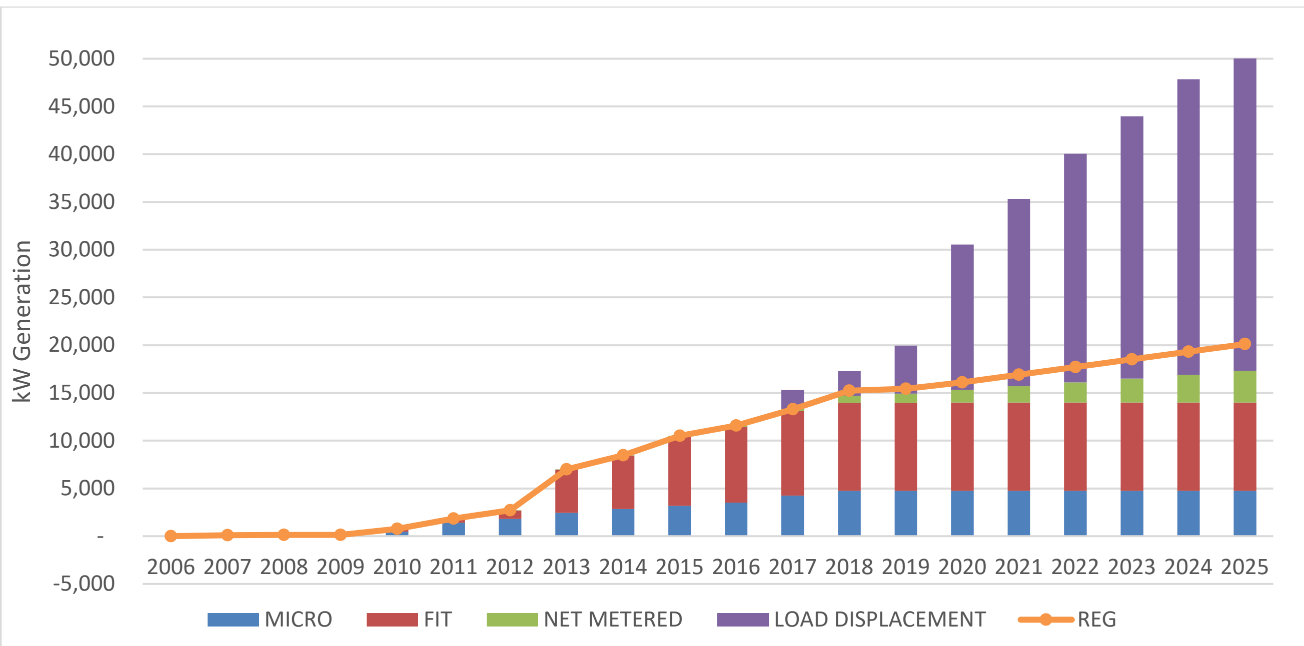
The impact of functional obsolescence on typical asset life is becoming more of a concern for WNH. Distribution assets whose functions rely on specialized electronic components, firmware or software are particularly susceptible to shorter lifecycles than their predecessors due to the rapid change in these technologies. Many of these components cannot be refurbished. For other components, their shelf life and the time frame under which vendor support is available is becoming increasingly shorter. Grid modernization technologies are particularly susceptible due to the use of highly specialized software, firmware and hardware. In addition, for a growing number of assets where refurbishment could be viable, higher standards, performance requirements or customer expectations force the utility into a procurement only option. The requirements of Reg. 22/04 and the need for certified test records for refurbished equipment to be used on new construction is such an example.

Renewable Energy Generation

WNH has sufficient capacity on its distribution system to accommodate REG forecasted to be connected over the forecast period. There is one constraint at Scheifele ‘A’ station due to the short-circuit rating limits of the station’s feeder breakers being reached. The constraint will be remedied with investments in 2020 and 2021, and will not materially impact WNH’s ability to connect REG over the forecast period.

WNH notes an increasing trend in the connection of Load Displacement Generation (behind the meter natural gas generation) since 2018. Allocated and pending projects signal a significant increase in LDG between 2020 and 2025. Problematic for REG in the future is the fact that natural gas generation can reduce available generation capacity at a much faster rate than renewable inverter-based generation. **Figure 4-3** illustrates WNH’s historical and forecast growth in generation.

Figure 4-3: Historical and Forecast Growth in Generation



More detailed information is available in **Appendix H** - “Renewable Energy Generation Investments Plan”.

4.2. (5.4.1) Capital Expenditure Planning Process Overview

4.2.1. (5.4.1a) Analytical Tools and Methods used for Risk Management

- *A detailed description of the analytical tools and methods used for risk management and its correlation to the capital expenditure plan. A distributor is responsible for managing its business risk in a manner to achieve its objectives through a comprehensive risk portfolio. These risks could include, but not limited to, system reliability, cyber-security, and climate change adaptation.*

This section describes WNH's identified business risks and the measures it takes to mitigate those risks.

Asset Health

WNH utilizes a number of asset condition inspection, testing, collection, assessment and analysis tools to manage its asset health risk.

- Mobile computing is used for the inspection and collection of asset data.
- WNH has partnered with METSCO to utilize their ENGIN software platform; a risk based asset analysis, prioritization and optimization tool. WNH has utilized this tool for its pole and cable replacement programs in the preparation of this DSP.
- Health Index Frameworks developed in consultation with METSCO cover WNH's major asset categories and brings greater standardization to asset condition assessment criteria and asset health grading.

Asset health analysis at WNH is an ongoing process. New asset health information received is analyzed; the outcomes of which are used to take immediate action (proactive replacement) or inform WNH's annual capital investment plan development.

Outputs from WNH's ACA process were used to identify and prioritize System Renewal investments in this plan.

System Reliability

WNH monitors reliability metrics on a regular basis. WNH utilizes AMI, ODS, SCADA and FLISR technologies to inform and take action to minimize customer power outage frequency and duration.

- WNH's Power Interruption Logging and Tracking (PILAR) tool is used to log, track and categorize reliability events for further analysis.
- Weekly meetings between senior Engineering and Operations staff discuss recent reliability incidents and initiate corrective action.
- WNH adopted the N-1 approach to contingency planning for critical assets, i.e. the power system must function properly even if a major component fails.

An illustrative example is WNH's use of reliability analysis to identify Worst Performing Feeder analysis resulting in additional maintenance such as tree trimming and Grid Modernization investments such as reclosers. Further detail can be found in **Appendix K** - WNH Distribution System Reliability Report, Section 5 and Section 7, Table 7-2.

Public Safety

- WNH performs annual safety inspections and infrared scanning of transformer vault rooms and distribution equipment installed in high risk areas such as playgrounds and schools.
- Safety patrols of overhead lines are conducted before re-energization when an outage cause is unknown.
- Community electrical safety awareness programs including public school safety demonstrations.
- All public safety incidents involving WNH's electrical distribution are reported to ESA and to the WNH Board of Directors. WNH looks for opportunities to prevent reoccurrence.

Illustrative examples include WNH's Public Safety initiatives that have resulted in maintenance and capital expenditures to repair/replace deficiencies and defects on its distribution equipment. Please refer to **Appendix P** - WNH Operations Maintenance Report and **Appendix K** - WNH Distribution System Reliability Report, Section 6 respectively.

Employee Injury

WNH has a strong safety culture which boosts productivity, employee morale, employee retention and operational efficiency.

- WNH invests in worker tools, equipment and protective clothing to allow workers to perform their work in a safe manner.
- WNH looks for opportunities to improve the ergonomics in the workplace, especially work functions with high task repetition, forceful exertions or repetitive/sustained awkward postures.
- WNH provides safety training including hazard awareness to prevent incidents and root cause analysis to prevent reoccurrence.
- WNH utilizes health and safety metrics to inform and guide its Health and Safety Program

Illustrative examples include WNH's expenditures in tools and equipment to reduce repetitive strain injuries and other ergonomic related ailments. Capital expenditures in fleet to maintain safe working platforms for working on energized lines.

Business Continuity

- WNH has succession plans in place for senior and key staff. These plans are reviewed and revised on a regular basis.
- WNH has implemented a number of cross training exercises with staff throughout the organization.
- As part of the 15 member GridSmartCity Cooperative, WNH has a Mutual Aid Agreement in place and benefits from a material standardization initiative, making it easier to source resources in times of natural and man-made emergencies.
- Operational and business continuity initiatives have resulted in the setup of an off-site backup control room along with full fibre optic communications to WNH's major assets.

WNH also has separate off-site backup servers for its corporate and business systems, allowing full business operations to resume in less than 24 hours.

- WNH has agreements with suppliers of major materials to carry inventory in cases of emergency.
- WNH has developed on-line computing apps to allow remote work-from-home for administration staff.
- WNH provides remote online payment, and electronic fund transfer options for its customers, vendors and contractors. Bill printing is also outsourced and performed remotely.

WNH's 2021 capital expenditures in Information Technology infrastructure and GIS are examples of investments made to maintain business continuity. Please refer to **Appendix B** – Material Capital Investments, Information Technology Asset Life Cycle and Operation Technology Software respectively.

Distribution Revenue and Stranded Assets

- Please refer to **Section 1.3.6**.

Cyber Security

WNH has adopted the OEB Cyber Security Framework (CSF), performs self-audits and submits information as part of the Electricity Report & Record Keeping Requirements (RRR).

- Using the Inherent Risk Profile Tool, and based on size, maturity and capability, WNH is categorized as having a Medium inherent risk profile. WNH is working towards implementing medium risk controls.
- WNH provides staff with continuous training and testing on cyber security.
- WNH partners with cyber security specialists to assist WNH in constantly monitoring and detecting threats; responding and recovering as needed.

Cyber security risk is being managed through a number of non-material investments throughout the forecast period.

Environmental Risk

- WNH’s PCB Reduction Program has identified and eliminated all oil filled equipment having PCB levels greater than or equal to 50 ppm. The program is now focused to reducing PCB levels to less than 2 ppm by 2025. Capital expenditures for the replacement of 167 transformers are embedded in System Renewal investments over the forecast period.
- WNH installed oil spill containment or mitigation measures at all large transformer stations.
- WNH is moving away from oil filled equipment where possible. Oil filled reclosers and switches have been mostly replaced with solid dielectric equipment.

Climate Change Adaptation

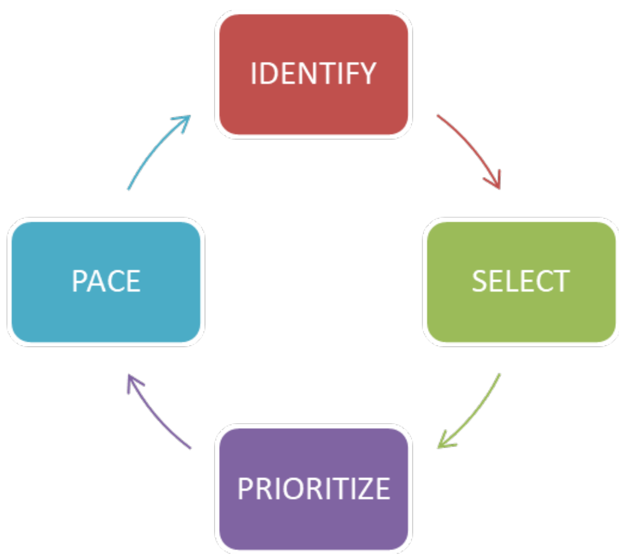
- WNH rebuilds overhead lines to the latest CSA C22.3 No. 1-10 – Overhead Systems Standard, Heavy weather conditions.
- Providing support to electric vehicles with on-site charging station for customers and employees.
- Waterloo North Hydro is also committed to a 20% reduction below 2010 levels in greenhouse gas emissions by the end of 2020. WNH is achieving this through landfill waste reduction, energy efficiency and supporting like mined organizations such as Sustainable Waterloo, Residential Energy Efficiency Project (REEP) Green Solution.

4.2.2. (5.4.1b) Processes, Tools and Methods

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

WNH utilizes a number of processes, tools and methods to identify, select, prioritize and pace the execution of its capital investment program. This section provides a high-level overview of the capital investment planning process which formulates WNH's annual and 5-year capital plans.

Figure 4-4: WNH Capital Planning Process



WNH begins its investment planning process with the identification of potential projects/programs. WNH continually collects and analyses information from its many and various data collection processes and consultations described in this DSP. WNH considers not only current information but also historical trends to inform the process. Some of the key inputs to WNH's investment planning process include:

- customer and third party requests;
- load and customer growth forecasts;
- asset health assessments (inspection & testing);
- asset performance assessments (reliability);
- CDM and REG impact;
- regulatory changes or mandated initiatives (public responsiveness);
- revenue projections;
- internal WNH initiatives; and
- customer bill impact.

The outcome of this work results in potential new projects/programs being identified and existing ones altered.

Not all projects identified will result in a planned capital investment. During the selection process, WNH will examine alternatives and determine the best approach which may result in maintenance activities, proactive replacement, refurbishment, alternative solutions or no action to be taken at all. WNH's selection process is conducted with the view of meeting the OEB's RRFE outcomes and also WNH's Mission, Vision, Corporate Values and Strategic Imperatives.

WNH attempts to prioritize and pace capital expenditures; balancing customer expectations, mandatory requirements, asset health, safety and performance.

The selection, prioritization and pacing of capital investments normally goes through a number of iterations before the investment plan is finalized and approved. With each iteration, WNH re-examines its ability to resource and finance the plan, as well as the impact on customer bills.

WNH believes that the outcome of this process is a well balanced, sustainable and affordable capital investment plan that meets the needs of all stakeholders. The finalized plan is then presented to the WNH Board of Directors for approval.

4.2.2.1. Identification of Capital Expenditures

Potential capital investments can be characterized as follows:

1. Mandated - regulation or code
2. Customer Driven - connections and expansions
3. Condition Based - asset health assessments
4. Performance Based - reliability and supply constraints
5. Operations and Administration Support – systems, equipment & tools

This assists WNH in placing selected investments in the correct investment categories.

System Access

System Access investments are mainly driven by mandated and customer requirements. As described in **Section 2.2**, System Access projects are identified through consultation processes with municipal planners, the development community, customers and other third parties as part of WNH's advanced planning for system development. These consultations can be initiated by either party. WNH also trends historical activity in some programs to aid in forecasting investments.

System Renewal

System Renewal investments are mainly driven by condition based requirements. They are identified through WNH's Asset Condition Assessment program which includes inspections, testing and other condition assessments. Health scores are developed for each asset and a condition rating is assigned. Assets that have low health scores will be in poor condition and at or near end-of-life are flagged for replacement.

System Service

System Service investment proposals are mainly driven by performance based requirements. They are identified from WNH's assessment of distribution system performance, system capacity/constraint analysis, power quality, and stray voltage reports.

WNH's Distribution System Reliability Report **(Appendix K)** refers to a number of tools WNH utilizes to identify and select system performance projects such as "worst performing feeders". Capacity constraints are normally identified through system load flow analysis and operational reports. Power quality and stray voltage concerns tend to reveal themselves through customer initiated reports.

General Plant

General Plant investments are mainly driven by operations and administration support requirements.

Material building projects are identified through poor performance, inspection and maintenance with the assistance of third party consultants in the building technologies and construction field.

Fleet/rolling stock vehicle replacements are determined through analysis of condition assessments, compliance with the Ontario Ministry of Transportation (MTO) safety requirements, maintenance and fuel consumption costing information (operation & maintenance), utilization (operating hours and total kilometers driven), and asset age. Costs are summarized annually and analyzed to determine maintenance cost trends by vehicle and equipment type.

Functional obsolescence forces a number of software/hardware investments. As software becomes older, vendors may no longer provide technical support, new functionality or enhanced cyber security protection. For hardware, support and parts become unavailable or newer releases of software require more powerful hardware systems to run. As time passes, software will be unable to operate with other dependent technologies, especially for many of today's software systems that operate in a highly integrated environment. Other IT investments are made to reduce licencing and maintenance costs or improve operational or administrative efficiency.

4.2.2.2. Selection of Capital Expenditures

Once potential projects are identified, WNH then goes through a selection process. Not all identified projects are selected in the same manner.

System Access

All investments required to be compliant with code or regulations are automatically selected. These investments normally fall into the category of System Access and include customer connections, expansions, third party requests, regulatory changes or mandated initiatives. The level of expenditure on these investments is driven by growth forecasts, various consultations, historical activity and public responsiveness measures.

System Renewal

System Renewal projects are normally the second group selected. Asset failures represent a significant risk to WNH in terms of public safety and system reliability.

For WNH's two largest asset classes, overhead and underground lines, the selection process considers condition assessments (inspection and testing), probability of failure (industry failure curves) and consequence of failure (customers impacted). In 2019, WNH started to utilize the METSCO Energy Solutions Inc. (METSCO) Asset Analysis, Prioritization and Optimization Tool (ENGIN) for these assets.

For all other asset classes, WNH utilized METSCO's Health Index Frameworks to develop asset health ratings for each asset. Potential investments are selected based on lowest scores; assets in poorest condition.

METSCO will be releasing its updated version of ENGIN sometime in Q2 of 2020. This will allow WNH to fully develop a risk based approach to capital planning for all of it assets.

System Service

Performance based investments fall under System Service and are the result of failure to meet prescribed (OEB, IESO) or adopted (IEC, IEEE, CEA, industry best practices) performance targets or to address power quality, reliability or supply constraints under contingency scenarios. They can also be a result of customer feedback.

Supply and reliability are WNH's top two strategic imperatives and consistently at or near the top in customer preferences. For the most part, project selection is based on proposed benefits, risk mitigation and alignment with WNH's Strategic Imperatives and the OEB's RRFE outcomes.

General Plant

Expenditures in General Plant are selected by the value they bring in supporting the operational and administrative function of the company. Value is based on proposed benefits, risk mitigation and alignment with WNH's Strategic Imperatives and the OEB's RRFE outcomes.

4.2.2.3. Prioritization of Capital Expenditures

This section describes WNH's prioritization process for capital expenditures in each investment category. Within each category different drivers and scoring mechanisms are used to develop project rankings.

System Access

System Access projects receive the highest priority. These investments are mandated by regulation, code or are customer driven. Within this group, a secondary prioritization process is conducted based the externally driven schedule and needs of the requesting parties. These prioritizations are often dynamic as third party needs often change from time of planning to execution of the work.

System Renewal

System Renewal investments as a group normally receive the second highest priority primarily due to the significant risk that asset failure poses in terms of public safety, system reliability and community relations.

System Renewal investments are prioritized based on the asset health condition scores and risk of failure. Transformer station related projects normally score high because of the customer impact of station related failures.

System Service

WNH uses its Strategic Imperatives as illustrated in **Table 4-4** to guide its prioritization for System Service investments. Projects that have multiple and/or higher ranked drivers have greater value and achieve a higher priority.

WNH also takes into account additional drivers or benefits in prioritizing projects. Grid modernization and constraint relief investments are often more efficiently executed when bundled with System Renewal and System Access projects. The majority of material investments in this category are supported by WNH's top Strategic Imperative of Supply and Reliability. In addition, WNH's customers have consistently ranked reliability at or near the top of their preferences

Table 4-4: WNH Strategic Imperative Rankings

Priority	Corporate Strategic Imperatives	Relative Weighting for Investment Prioritization	% Scale
1a	Supply	5.0	100%
1b	Reliability	4.5	90%
2a	Health, Safety	4.0	80%
2b	Environment	3.5	70%
3	Customer Service	3.5	70%
4	Employee Relations and Development	3.0	60%
5	Productivity and Cost Reduction	2.8	56%
6	Organizational Effectiveness	2.5	50%
7	Financial Performance	2.2	44%
8	Shareholder and Community relations	1.0	20%
9	System Aesthetics	0.5	10%

General Plant

WNH uses its Strategic Imperatives as illustrated in **Table 4-4** to guide its prioritization for General Plant investments. Typically included are improvements in: worker safety, ability to continue to provide services to customers, opportunity for cost reduction, increase in productivity, operating efficiency, ability to operate and maintain, and ability to adapt to future needs. The more drivers or benefits that are attributed to a project, the higher its priority.

WNH also takes into account additional drivers or benefits in prioritizing the projects. Asset health condition assessments performed on fleet vehicles allow those assets in poorest condition to be prioritized for replacement. IT assets because of their age and technology are expensive to maintain and modify relative to the purchase of new technologies. Performance gaps, operational efficiencies, the cost to maintain existing software and the cost to move to more efficient platforms are used to assess the value used in determining the priority of a project. Information technology providers also often set timelines by which support is no longer available and obsolescence sets in.

4.2.2.4. Pacing of Capital Expenditures

In the development of its overall capital investment plan, System Access investments take priority and WNH looks to adjust the pace of projects in other areas of the business to complete this work. Most, if not all, of WNH's System Access investments are required in order to be compliant with code or regulations, meaning that WNH has only limited influence on the magnitude and timing of the required investments. Projects are prioritized and scheduled based on the timing needs of the customer and their readiness to proceed. This leaves little room to pace these expenditures. Where conflicts occur, extra resources may need to be procured.

For System Renewal investments, WNH looks beyond the 5-year forecast period to determine the rate of approaching asset replacements and develops a pace of replacement that attempts to levelize capital expenditures and resources. As with the case of WNH's underground cable population, **Section 2.1.1.1** describes the plan to pace WNH's direct buried underground cable replacements. This approach was developed to lower the risk to WNH as the timing of asset failure is never a certainty and with a large approaching population of assets near end-of-life, even a small sudden change in failure rates could be overwhelming.

System Service investments tend to be more flexible and are often planned in conjunction with System Access and System Renewal investments so as to help levelize the overall investment plan.

General Plant investments are important in supporting day-to-day business and operations activities. These investments need to occur, however, they tend to be more flexible in scheduling which allows WNH to utilize them to build a more levelized overall investment plan.

As previously mentioned, WNH's investment planning process is an iterative process. WNH attempts to pace the investment plan not only with identified needs, but also its ability to resource and finance the plan as well as consider the impact on customer bills.

4.2.3. (5.4.1c) Method and Criteria used to Prioritize REG investments

- *If different from that described above, the method and criteria used to prioritize 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)*

There are different technical requirements between FIT, Net Metered and Load Displacement generation, however the connection process is the same for all generation.

The prioritization process for REG expansions is the same as for any distribution system expansion projects where the REG expansion is triggered and driven by customer requirements. As a System Access project, overall they receive the highest prioritization, however projects are scheduled and executed based on the timing needs of the customer and their readiness of the customer to proceed.

For the expansion or enhancement to the distribution system to connect an embedded generation facility, WNH follows the provisions of the OEB Distribution System Code Section 3.2, Expansions.

WNH will accommodate new REG projects up to the capacity limit of its distribution system and without detriment to existing load and REG customers.

WNH has no plans over the forecast period to install distributor-owned renewable generation.

4.2.4. (5.4.1d) Assessing Non-Distribution System Alternatives

- *The distributor's approach to assessing non-distribution system alternatives to relieving system capacity or operational constraints, including the role of Regional Planning Processes in identifying and assessing alternatives*

Currently WNH does not have any material system capacity or operational constraints on its distribution system, nor does it foresee any over the forecast period. The following is WNH's planned approach to assessing non-distribution or non-wires alternatives (NWA). The first anticipated need to implement this approach will be a potential station capacity upgrade forecast in the 2026 - 2030 time frame.

1) Identify System Need

WNH reviews its system loading and capacity, system performance, asset capacity, and asset health on a regular basis. Included is the amount of embedded generation, energy storage, and their contribution at times of peak system loading.

2) Screen against NWA Criteria and Identify Potential Candidates

When capacity or operational constraints are identified, WNH screens for NWA before developing a material capital investment plan.

Criteria to assess NWA include:

- The alternative cannot add to the overall cost of a project. Certain constraints on the distribution system still require the existing under-capacity assets to remain in service to serve other customers. Assets that cannot be eliminated, must still be maintained, inspected, and replaced when at end of life. The total cost of the NWA includes the cost of stranded assets.
- The NWA must have equal or greater reliable operation and capacity as a distribution solution. (i.e. capacity from a wind generator is not the same as capacity from a distribution line)

- The alternative must be able to be implemented within the time line required to relieve the constraint.
- Certain alternatives do not eliminate a constraint but defer a distribution solution to a future date. The deferment in terms of cost and time must be material.

3) Cost of Wires and Non-Wires Alternatives

   Once NWA candidate projects have been identified, provide costing for projects along with wires solutions.

4) Conduct Cost Benefit Analysis
5) Choose and Implement the solution

Regional Planning

WNH has been a full and active member of the Kitchener-Waterloo-Cambridge-Guelph (KWCG) Region Study Team since its inception in 2010. WNH considers the role of Regional Planning is integral in identifying and assessing alternatives to relieving system capacity or operational constraints and has benefitted from this initiative.

WNH fully participated in the KWCG Region's first cycle of Regional Planning which was completed in 2015. During that process two items relating to WNH were discussed.

First, WNH had experienced Loss-of-Supply events with HONI's 230 kV D6V and D7V circuits involving double circuit outages losing two-thirds of its total transmission supply. WNH did not have the capacity to transfer this magnitude of load to its other stations. The regional planning process identified this as a concern as noted:

- *"As per section 6.2.2 of the IRRP, the transmission infrastructure supplying load in the Waterloo-Guelph 230 kV sub-system does not meet reliability requirements to quickly restore supply in the event of a major outage involving the loss of both transmission circuits, D6V and D7V. To address the load-restoration need of the Waterloo-Guelph 230 kV sub-system, the IRRP Working Group's preferred alternative is to install two new 230 kV in-line switches near Guelph North Junction. This project is identified in Hydro One's KWCG*

Adequacy of Transmission Facilities & Transmission Plan 2016-2025 report, reference [2]/Appendix F as well as reference [1] "

-

The work was completed under the GATR project following the OEB approval in September 2013. This example demonstrates how WNH utilized the regional planning process to identify alternatives to a distribution capacity issue.

The second item identified during the first cycle of regional planning was the step-down transformation capacity for Waterloo North Hydro. WNH was anticipating the need to construct a new transformer station (MTS#4) by 2024. Reductions in peak demand over the forecast period due to CDM initiatives, time-of-use load shifting and contributions from embedded generation have contributed to the deferral of this project past 2025. Currently WNH is participating in the second cycle of regional planning which is underway for the Kitchener-Waterloo-Cambridge-Guelph (KWCG) Region. The next IRRP for the region is anticipated to be completed in Q2 2020. The step-down capacity issue for WNH has been once again identified during the IESO's Scoping Assessment Outcome Report. The recommendation includes:

- *Both Waterloo North Hydro (WNH) and Energy+ have identified the need for new capacity in the next five to 10 years, tied, in part, to demand from development of the "East Side Development Lands." The two new potential stations for each LDC, as well as Preston TS (if expansion is possible) are all theoretically positioned to service future load growth. New capacity in the area could be optimized to address the growth needs of both LDCs. The integration exercise will also consider Preston TS end-of-life replacement plans and potential optimization with incremental capacity needs. This capacity study will consider whether the Preston TS can be expanded to supply future load growth rather than deferring the end-of-life transformer replacement plans slated to be in service for 2025-2026. The study group recommends that need for new capacity for WNH and Energy+ be addressed in the IRRP in consideration of capacity at Preston TS.*

More information on this can be found in **Appendix F** - KWCG IRRP Scoping Assessment Outcome Report (2019).

4.2.5. (5.4.1e) Modernization of the Distribution System

- *A distributor's strategy in taking advantage of opportunities that arise during system planning to implement cost-effective modernization of the distribution system such that it becomes more efficient, reliable, and provide more customer choice.*

Many of WNH's System Service investments include grid modernization technologies which become incorporated into System Renewal and System Access projects. A number of General Plant investments also include investments that support modernization initiatives.

- *The options a distributor has considered for facilitating customer access to consumption data in an electronic format*

Waterloo North Hydro's website is an information resource for customers on areas of interest including rates, understanding their bill, energy efficiency programs and tips, and electrical safety information. WNH's website is also a portal to a number of online tools that provide customers and WNH with efficiencies. Online tools include the My Account portal which provides customers with free access to their account information including amount owing and payment history, electronic copies of their bills, and information on their electricity consumption including a customer's monthly, daily and hourly usage. A customer can access their My Account from a personal computer, tablet, or mobile phone 24 hours a day, seven days a week. WNH customers can also download their electrical consumption data via WNHs My Account in Excel and Green Button format.

WNH also provides General Service customers (>200 kW) and Large Users (>5,000 kW) with direct access to their revenue meters to obtain real-time consumption data. WNH either provides a pulse output to the customer or the customer can interrogate the meter with the appropriate meter reading software. WNH currently has 29 customers taking advantage of this feature.

- *The mechanisms that facilitate real-time data access and behind the meter services and applications that a distributor has considered for the purpose of providing customers with the ability to make decisions about their electricity costs*

Based on WNH's most recent customer consultations, access to real time data and behind the meter services have not been identified by customers as priority expectations. However, from these consultations it was clear that cost and energy efficiency education is very important to customers. Also business customers are very interested in having these services available to them. Although the government has cut the CDM programs delivered by the LDCs, there is still a need for local energy efficiency education and as a result, WNH added two Key Account positions for 2021. These positions will work with customers to help them manage their energy costs through a better understanding of how they are using energy, implementation of energy efficiency and demand side management projects, and taking advantage of complimentary programs such as the Industrial Conservation Initiative. This will allow customers to make better decisions about their energy use.

- *The investments necessary to facilitate the integration of distributed generation, distributed energy resources and more complex loads (e.g., customers with self generation and/or storage capability).*

WNH has determined that the Scheifele 'A' station has reached its maximum short-circuit rating limits for the station's feeder breakers. The fault contribution from existing connected embedded generation, Hydro One's transmission system upgrade as part of the Guelph Area Transmission Reinforcement (GATR) project, and transmission connected generation have incrementally contributed to the increase in short circuit levels. WNH is moving forward with the work to reduce the risk of catastrophic failure of the circuit breakers during a fault clearing event. WNH has determined that the most cost effective solution will be to upgrade the feeder breakers at the station. The project will be executed over 2 years. WNH has included the cost to replace these circuit breakers, $230,244 in 2020 and $209,762 in 2021, in its capital investment program. A secondary benefit from these investments will be that generation capacity at the stations will also be increased by 6,630 kW.

WNH is also forecasting annual expenditures of approximately $156,000 for REG connections. WNH is not proposing any other material capital investments to accommodate the connection of generation for the period 2021 to 2025.

Although not their primary driver, System Renewal investments outlined in this DSP support the connection of REGs and DERs as lines with larger conductor and higher voltage allow more of these resources to be connected and provide a larger choice of siting locations on the distribution system.

- *The technology-enabling opportunities a distributor has considered to increase operational efficiencies, improve asset management or enhance service to customers*

Over the forecast period, WNH will be making incremental investments in grid modernization, capacity transfer and system operation and safety. These investments are instrumental in maintaining reliability and safety performance measures as well as providing opportunities to better utilize existing capacity and improving overall efficiency of the distribution system.

In 2020, WNH will be adding an asset management position in the engineering department to expand the use of its Asset Analysis, Prioritization and Optimization Tool, enhance the efficiency of WNH's asset data collection tools, fully develop WNH's risk-based asset analysis and better monitor WNH's overall Asset Management Program.

- *The distributor's adoption of innovative processes, services, business models, and technologies.*

WNH continues to invest in automated switching devices and electronic fault indicators to enhance the capabilities of other grid modernization technologies such as OMS and FLISR and to bring the benefits of these technologies to a broader base of customers. WNH has averaged over 1.64 million customer outage minutes saved annually since 2016 and 1.7 million customer minutes in 2019. These savings only occurred on the section of the distribution system enabled with these technologies. Investments in the forecast years will allow WNH to expand the use of these technologies further into the distribution system allowing a greater number of customers to benefit. This activity aligns with the LTEP goal of "Improving Value and Performance for Consumers" and the OEB directive to "Strengthen Utility Accountability to Customers".

Communication networks are vital in collecting and delivering operational data in a modern grid. WNH continues to invest in wireless and fibre optic communications as the number of Smart Grid devices on the distribution system grows. This activity aligns with the LTEP goal of “Innovating to Meet the Future” by deploying communication technology necessary to monitor the grid.

WNH is investing in Autodesk’s AutoCAD Utility Design (AUD) software which combines design and standards documentation with rules-driven workflows and analysis for utility distribution design. WNH will integrate the AutoCAD drafting platform with: ERP work order and material management system; GIS and engineering analysis platforms, and state-of-the –art three dimensional (3D) design standards developed through membership in the Utilities Standards Forum (USF). WNH will be able to improve its design efficiency and reduce GIS data entry labour.

WNH implemented Automatic Vehicle Location (AVL) in its fleet vehicles. NeoConneX Fleet Manager is the GPS and Telematics tool providing visibility to vehicle location for better operational efficiencies during power outage response. WNH also uses this system to enhance worker safety by alerting the control centre in an emergency when working alone in the field.

Waterloo North Hydro’s website is an information resource for customers on areas of interest including rates, understanding their bill, energy efficiency programs and tips, and electrical safety information. WNH’s website is also a portal to a number of online tools that provide customers and WNH with efficiencies. Online tools include:

- My Account provides customers with free access to their account information including amount owing and payment history, electronic copies of their bills, and information on their electricity consumption including a customer’s monthly, daily and hourly usage. A customer can access My Account from a personal computer, tablet, or mobile phone 24 hours, seven days a week. Plans exist to expand this online technology to automate the requests for electrical service changes and upgrades.

- Online forms for new accounts, the transfer of accounts, or closing of accounts allow customers to complete these common account processes online 24 hours a day, seven days a week. The forms are fully integrated with WNH's Customer Information System, making the process easy for customers, while ensuring the standardization of the information entered which minimizes errors, decreases the follow up required with customers, and reduces the back office processing time.

- WNH's Outage Management System (OMS) provides customers with real-time information on WNH's distribution system, and shows both planned and unplanned outages. The system displays the area(s) impacted by outages geographically overlaid on a map of WNH's service territory, and shows customers the status of each outage i.e. under investigation, crews dispatched, etc., as well as the number of customers impacted by each outage, and the estimated time of restoration.

WNH has implemented Mobile Computing allowing crews to use laptops/tablets to interact with IT/OT systems and applications installed at the central office without having to drive back to the office. Mobile computing is currently being utilized for locates, asset inspections, feeder patrols, meter changes, and high bill investigations. WNH expects the scope of work using mobile computing to expand over the forecast period.

WNH implemented its new industry leading JOMAR Softcorp Customer Information System (CIS) in 2017. The new CIS allows for:

- fast and efficient changes in billing parameters, rate changes
- easily configurable on-bill messaging changes to support corporate and regulator notices
- easy customer online access to billing and consumption data
- lower operation and maintenance costs than previous system
- supports customer centric website portal and My Account features.
- capability of supporting the Green Button Data standard which will facilitate near real-time open data access for customers using third party applications

WNH, in partnership with a vendor of underground switchgear, developed a unique and innovative solution to automating existing manually operated underground switches. The solution involved the development of a controller which increased the functionality and reduced the size and cost of remotely controlling WNH's underground switches. The first controller went into service in 2018, with 4 more installed in 2019 and 5 more planned for 2020. The retrofitted underground switchgear provides ten more operating points as part of WNH's FLISR system at a lesser cost than replacing the switchgear.

4.2.6. (5.4.1f & 5.4.1.1) Rate-Funded Activities to Defer Distribution Infrastructure

- *Consideration of distribution rate funded CDM programs, that are not funded by the Global Adjustment Mechanism, to defer distribution infrastructure as described below*

There are no rate-funded CDM programs in this DSP for the 2021 – 2025 forecast period. Alternatively, WNH conducts the following activities to inform its infrastructure planning and defer capital investments. These activities are funded as part of WNH's O&M expenditures.

WNH continually monitors Total System Demand which includes demand through IESO wholesale metered points of supply, distribution embedded system generation and energy storage systems. WNH has installed or has access to metering at all large embedded generation and battery storage projects giving it the ability to measure the amount of generation contributing to the distribution system at any time, but especially at the time of peak demand. Total embedded generation contributed 9.12 MW to reducing WNH's 2019 system peak. An IESO contracted 2.0 MW battery storage system did not contribute to reducing WNH's 2019 system peak. WNH analyzes all demand data on a regular basis and uses this information to inform its decisions on capacity expansion or deferral. Most significant of these is the deferral of WNH's proposed MTS #4 station outside of the 2021 – 2025 forecast period.

WNH has also implemented a re-verification sampling plan for its first generation residential smart meters. The sampling plan was developed in accordance to Measurement Canada Specifications and is used to track meter performance. Testing is performed by an independent, third party, Measurement Canada accredited facility. The resulting data informs WNH's meter replacement forecast and allows WNH to apply for meter seal period extensions without 100% re-verification testing of the entire population. Sample testing performed between 2016 and 2019 has demonstrated that the meters continue to perform within Measurement Canada specifications. In 2018 and 2019, WNH completed final reverification testing of 36,195 meters and received an 8-year meter seal extension, the maximum allowed by Measurement Canada. Final re-verification testing for the remaining

19,016 meters will be completed between 2020 and 2025. WNH expects these meters to have similar test results and will also qualify for an 8-year seal extension.

4.3. (5.4.2) Capital Expenditure Summary

WNH's capital expenditure summary covers a ten-year period (2016 – 2025), which includes five historical years (2016 – 2020) and five forecast years (2021 – 2025). The Bridge and Test years are 2020 and 2021 respectively. Historical expenditures are provided after adjustments resulting from WNH's 2016 application. Variance analyses, both year-to-year and plan-to-actual are also provided. The information provided in this section is current as of Dec 31, 2019. Due to the timing of the application no actual 2020 expenditures are provided.

Test year material expenditures are provided in detail along with comparisons to historic and forecast expenditures. The level of materiality for capital investments has been established at $190,000. Forecast expenditures are provided for 2022 – 2025 along with comparisons to historic expenditures levels. There are no expenditures planned for non-distribution assets in the test year.

All WNH capital investments are allocated into one of the four OEB categories as prescribed in Chapter 5.

4.3.1. Comparison of Historical & Forecast Capital Expenditures

Table 4-5 provides WNH's capital plan (OEB approved after adjustments), annual budget and actual expenditures from 2016 to 2019 along with WNH's forecast expenditures for the forecast years 2021 - 2025. There were no 2020 actual expenditures available at the time of filing. Also included is WNH's actual and forecast operating and maintenance expenditures over the same periods. This table contains the information required by **Chapter 2**, **Appendix 2-AB**. **Figure 4-5** illustrates the relationship between capital expenditures and O&M from 2016 to 2025.

In 2016, WNH made a substantial one-off investment in a new Waterloo Region Light Rail Transit (LRT) project. The project created exceedances in both 2016 System Access expenditures and contributed capital as a result of the increase in scope-of-work required by the project. **Figure 4-6** illustrates the 2016 impact the LRT project had in comparison to other WNH historical and forecast expenditures.

Figure 4-7 illustrates the percentage investment in each of the four OEB categories between 2016 and 2025. Once past the LRT project (2016), the percentage of investment in each of the four investment categories settles in to a more normalized pattern.

System Service investments trended higher over the forecast period mainly due to the recapture of work deferred due to the LRT. When taking the forecast period into account, over all System Service investments are trending down. More detailed information on annual variances is provided in **Section 4.3.2.1** to **Section 4.3.2.4** inclusive.

Table 4-5: Historical & Forecast Expenditures (000's) 2016-2025 (Appendix 2-AB)

OEB Investment Category	Historical Period														
	2016					2017					2018				
	Plan	Budget	Actual	Var % Actual to Plan	Var % Actual to Budget	Plan	Budget	Actual	Var % Actual to Plan	Var % Actual to Budget	Plan	Budget	Actual	Var % Actual to Plan	Var % Actual to Budget
System Access	$ 11,172	$ 8,952	$ 17,628	57.8%	96.9%	$ 7,521	$ 8,700	$ 6,299	-16.3%	-27.6%	$ 6,020	$ 7,938	$ 6,091	1.2%	-23.3%
System Renewal	$ 7,360	$ 8,080	$ 7,801	6.0%	-3.5%	$ 10,001	$ 8,542	$ 9,482	-5.2%	11.0%	$ 9,438	$ 6,999	$ 8,424	-10.8%	20.3%
System Service	$ 2,406	$ 2,601	$ 1,742	-27.6%	-33.0%	$ 1,680	$ 1,359	$ 567	-66.3%	-58.3%	$ 1,725	$ 2,307	$ 1,822	5.6%	-21.0%
General Plant	$ 1,869	$ 3,368	$ 2,288	22.4%	-32.1%	$ 2,814	$ 2,023	$ 2,265	-19.5%	11.9%	$ 1,661	$ 2,682	$ 2,030	22.2%	-24.3%
Gross Total CAPEX	$ 22,807	$ 23,001	$ 29,460	29.2%	28.1%	$ 22,016	$ 20,625	$ 18,612	-15.5%	-9.8%	$ 18,845	$ 19,926	$ 18,368	-2.5%	-7.8%
Capital Contributions	$ 6,372	$ 5,303	$ 12,636	98.3%	138.3%	$ 2,352	$ 2,298	$ 4,579	94.7%	99.2%	$ 1,902	$ 2,266	$ 2,969	56.1%	31.0%
Net Capital CAPEX	$ 16,434	$ 17,698	$ 16,823	2.4%	-4.9%	$ 19,664	$ 18,326	$ 14,033	-28.6%	-23.4%	$ 16,943	$ 17,659	$ 15,399	-9.1%	-12.8%
Total O&M	$ 7,548		$ 7,363	-2.5%				$ 7,558					$ 7,985		

OEB Investment Category	Historical Period					Bridge Year					Test Year	Forecast Period			
	2019					2020					2021	2022	2023	2024	2025
	Plan	Budget	Actual	Var % Actual to Plan	Var % Actual to Budget	Plan	Budget	Actual	Var % Actual to Plan	Var % Actual to Budget	Budget	Forecast	Forecast	Forecast	Forecast
System Access	$ 5,947	$ 7,519	$ 6,243	5.0%	-17.0%	$ 6,086	$ 5,839				$ 5,840	$ 6,166	$ 6,305	$ 6,448	$ 6,592
System Renewal	$ 8,801	$ 8,303	$ 9,439	7.2%	13.7%	$ 8,976	$ 8,612				$ 8,096	$ 9,372	$ 9,548	$ 9,693	$ 9,951
System Service	$ 1,175	$ 1,739	$ 2,449	108.4%	40.8%	$ 1,176	$ 2,199				$ 2,294	$ 1,346	$ 1,288	$ 1,211	$ 1,212
General Plant	$ 1,670	$ 2,581	$ 1,810	8.4%	-29.9%	$ 1,650	$ 3,555				$ 2,819	$ 3,567	$ 3,594	$ 2,063	$ 2,222
Gross Total CAPEX	$ 17,593	$ 20,141	$ 19,941	13.3%	-1.0%	$ 17,887	$ 20,205				$ 19,049	$ 20,452	$ 20,736	$ 19,415	$ 19,977
Capital Contributions	$ 1,902	$ 2,969	$ 2,111	11.0%	-28.9%	$ 1,902	$ 2,067				$ 2,642	$ 2,710	$ 2,764	$ 2,819	$ 2,876
Net Capital CAPEX	$ 15,691	$ 17,172	$ 17,830	13.6%	3.8%	$ 15,985	$ 18,138				$ 16,406	$ 17,742	$ 17,972	$ 16,596	$ 17,102
Total O&M			$ 7,767				$ 7,907				$ 8,214	$ 8,378	$ 8,546	$ 8,717	$ 8,891

Figure 4-5: Historical and Forecast Gross CAPEX vs O&M

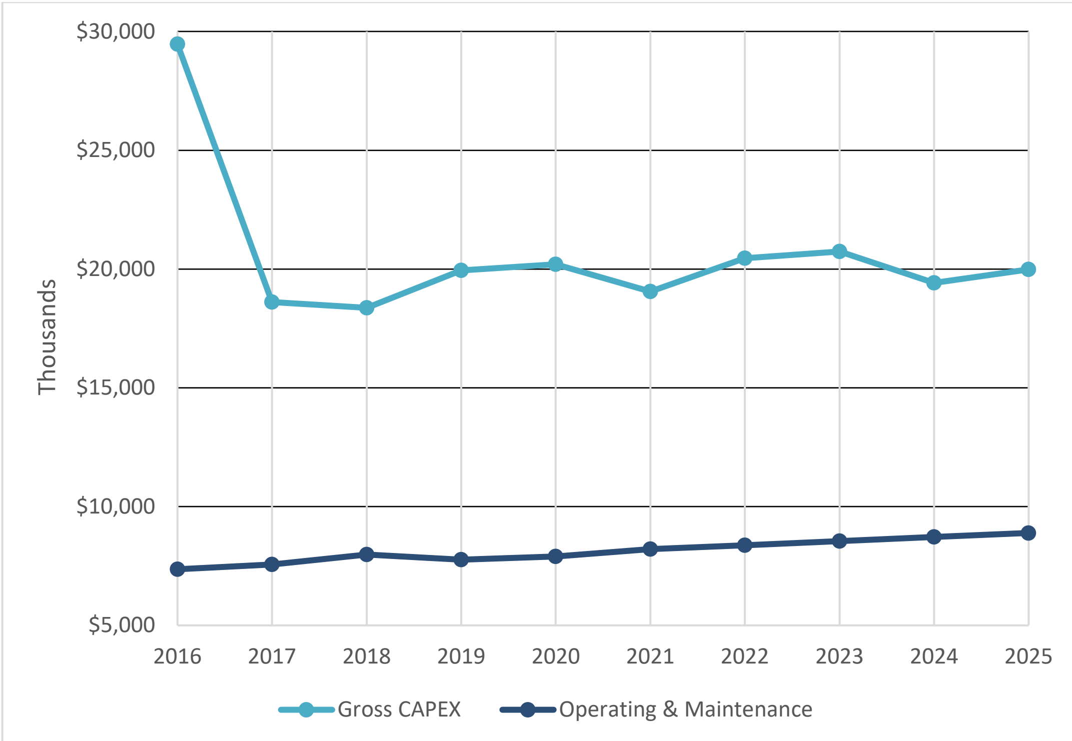


Figure 4-6: Historical and Forecast Gross & Net Capital Expenditures (%)

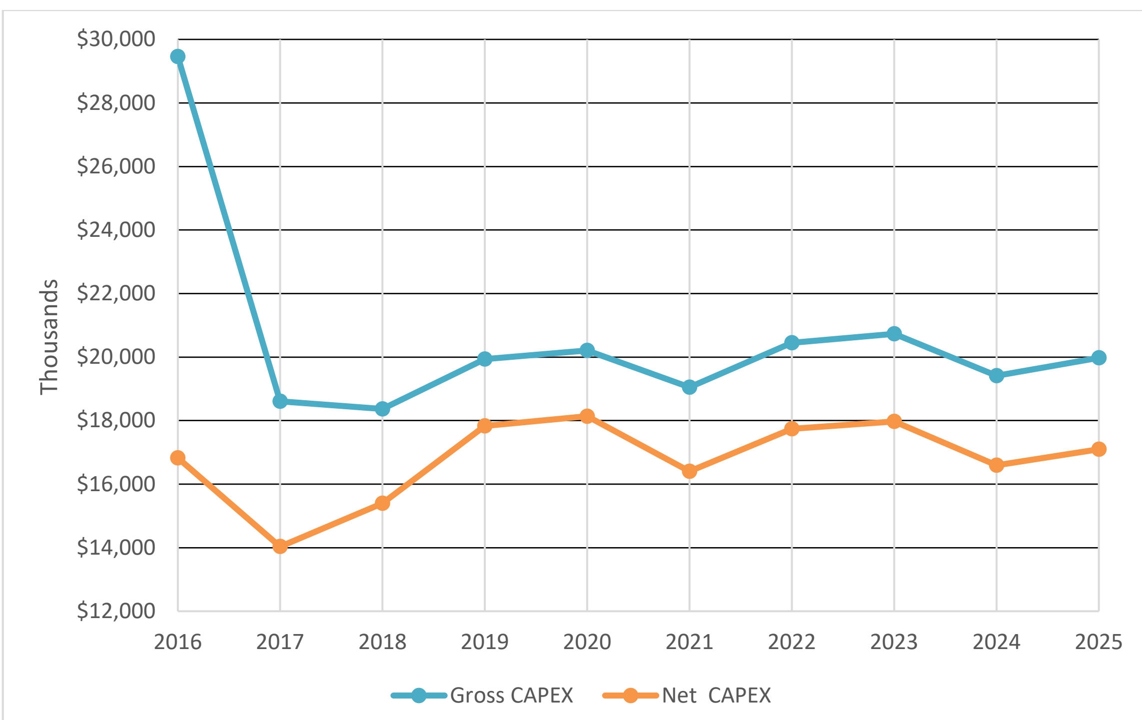
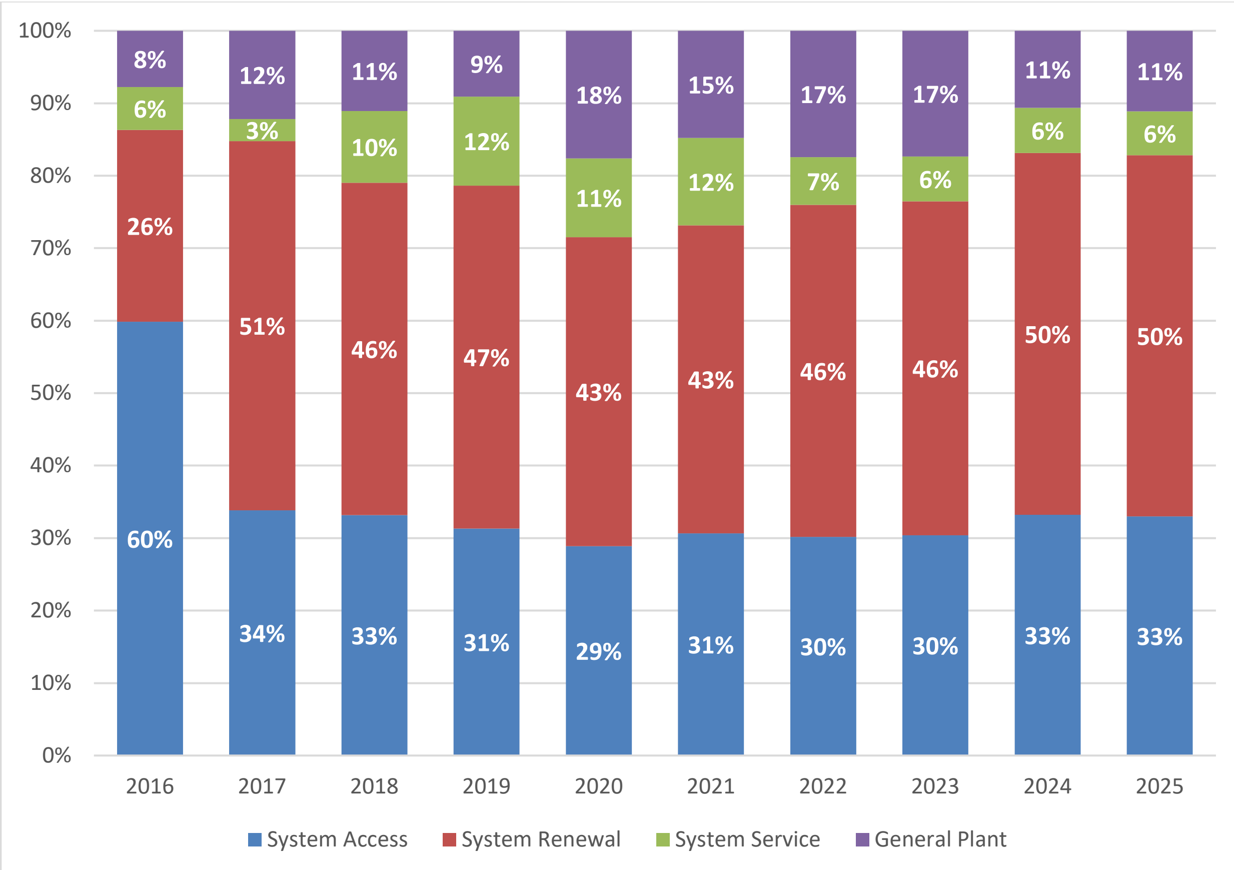


Figure 4-7: Historical and Forecast Gross Capital Expenditures (%)



4.3.2. Historical Period Variance Analysis - Year to Year Capital Expenditures

Table 4-6 provides a summary of historical expenditures from 2016–2020. In 2016, WNH made a substantial one-off System Access investment due to the new Waterloo Region Light Rail Transit (LRT) project. The exceedance in 2016 System Access expenditures was as a result of an increase in the scope of work required by the project.

Table 4-6: Historical Expenditures 2016 - 2020

OEB Investment Category	Historical Period				Bridge Year	Average Annual Investment	% Average Annual Investment
	2016	2017	2018	2019	2020	2016-2020	2016-2020
System Access	$17,628,164	$6,298,503	$6,091,460	$6,243,182	$5,839,159	$8,420,094	39%
System Renewal	$7,801,178	$9,481,900	$8,423,589	$9,438,714	$8,612,076	$8,751,491	41%
System Service	$1,742,066	$566,843	$1,822,412	$2,449,054	$2,198,991	$1,755,873	8%
General Plant	$2,288,204	$2,264,671	$2,030,139	$1,810,228	$3,554,579	$2,389,564	11%
Totals	$29,459,613	$18,611,917	$18,367,600	$19,941,178	$20,204,805	$21,317,023	100%
Contributed Capital	$12,636,204	$4,578,501	$2,968,930	$2,110,939	$2,065,806	$4,872,076	23%
Net CAPEX	$16,823,409	$14,033,416	$15,398,670	$17,830,239	$18,138,999	$16,444,947	
O&M	$7,362,820	$7,558,307	$7,985,117	$7,766,704	$7,907,049	$7,715,999	

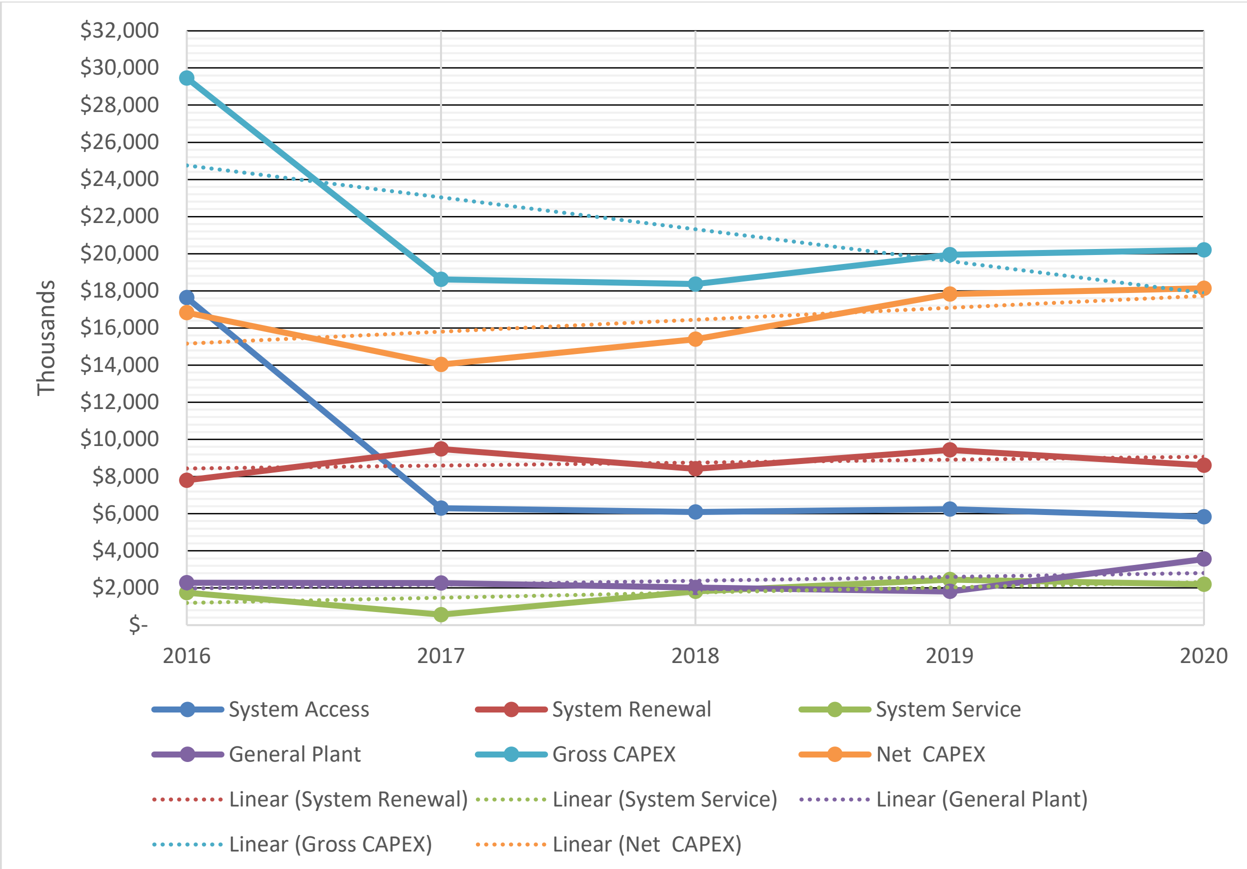
Table 4-7 provides 2017 – 2020 average expenditures which excludes the major impacts of the LRT project. System Access average annual expenditures drops to $6.2 million which is more typical of annual spending in this category.

Table 4-7: Historical Expenditures (2016 SA Adjusted)

OEB Investment Category	Annual Historical Average	Annual Historical Average
	2016 - 2020	2017 - 2020
System Access	$ 8,420,094	$ 6,118,076
System Renewal	$ 8,751,491	$ 8,989,070
System Service	$ 1,755,873	$ 1,759,325
General Plant	$ 2,389,564	$ 2,414,904
Gross CAPEX	$ 21,317,023	$ 19,281,375
Contributed Capital	$ 4,872,076	$ 2,931,044
Net CAPEX	$ 16,444,947	$ 16,350,331

Figure 4-8 illustrates the same affect on annual historical and forecast expenditures.

Figure 4-8: Historical Gross Capital Trending ($)



4.3.2.1. Variance in Capital Expenditures (2016-2017)

Table 4-8: 2016-2017 Capital Variances by Investment Category

OEB Investment Category					Historical Average	Variance to Historical Average
	2016	2017	2017 - 2016		2016 - 2020	2017 – Avg.
	Actual	Actual	Variance	% Diff		Variance
System Access	$ 17,628,164	$ 6,298,503	$ (11,329,661)	-64.3%	$ 8,420,094	$ (2,121,591)
System Renewal	$ 7,801,178	$ 9,481,900	$ 1,680,722	21.5%	$ 8,751,491	$ 730,408
System Service	$ 1,742,066	$ 566,843	$ (1,175,223)	-67.5%	$ 1,755,873	$ (1,189,030)
General Plant	$ 2,288,204	$ 2,264,671	$ (23,534)	-1.0%	$ 2,389,564	$ (124,894)
Gross CAPEX	$ 29,459,613	$ 18,611,917	$ (10,847,696)	-36.8%	$ 21,317,023	$ (2,705,106)
Contributed Capital	$ 12,636,204	$ 4,578,501	$ (8,057,703)	-63.8%	$ 4,872,076	$ (293,575)
Net CAPEX	$ 16,823,409	$ 14,033,416	$ (2,789,993)	-16.6%	$ 16,444,947	$ (2,411,531)

From 2016-2017, overall gross CAPEX decreased by 36.8% and net CAPEX decreased 16.6%. Both decreases in 2017 were, for the most part due to the ending of the LRT project and a return to a more normalized work program. WNH had negotiated a relatively high rate of recovery (72%) for capital expenditures for the LRT project. In 2016, and to a lesser extent in 2017, contributed capital was significantly elevated over normal SA project levels. Capital expenditures did not have a material impact on O&M costs.

System Access (SA)

As previously mentioned, 2016 SA expenditures were abnormally high due the LRT project. Correspondingly the capital contributions associated with this work were also higher. WNH deferred other CAPEX planned for 2016 in order to meet the mandated timelines of the LRT project. The expenditure decrease observed in 2017 was for the most part due to a return to a more normalized work program.

System Renewal (SR)

The increase in 2017 SR projects was an effort to catch up on work that had been deferred from 2015 and 2016 due to the LRT.

System Service (SS)

WNH deferred some 2017 SS projects into 2018 in an effort to catch up on higher priority SR work that had been deferred from 2015 and 2016 due to the demands of the LRT project.

General Plant (GP)

GP spending levels in 2017 were inline with 2016 expenditures.

4.3.2.2. Variance in Capital Expenditures (2017-2018)

Table 4-9: 2017-2018 Capital Variances by Investment Category

OEB Investment Category					Historical Average	Variance to Historical Average
	2017	2018	2018 - 2017		2016 - 2020	2018 – Avg.
	Actual	Actual	Variance	% Diff		Variance
System Access	$ 6,298,503	$ 6,091,460	$ (207,043)	-3.3%	$ 8,420,094	$ (2,328,633)
System Renewal	$ 9,481,900	$ 8,423,589	$ (1,058,311)	-11.2%	$ 8,751,491	$ (327,903)
System Service	$ 566,843	$ 1,822,412	$ 1,255,568	221.5%	$ 1,755,873	$ 66,538
General Plant	$ 2,264,671	$ 2,030,139	$ (234,531)	-10.4%	$ 2,389,564	$ (359,425)
Totals	$ 18,611,917	$ 18,367,600	$ (244,317)	-1.3%	$ 21,317,023	$ (2,949,422)
Contributed Capital	$ 4,578,501	$ 2,968,930	$ (1,609,571)	-35.2%	$ 4,872,076	$ 1,484,465
Net CAPEX	$ 14,033,416	$ 15,398,670	$ 1,365,254	9.7%	$ 16,444,947	$ 7,699,335

Overall gross CAPEX decreased 1.3% however capital contributions decreased by 35.2% resulting in an increase in net CAPEX of 9.7%. Capital contribution levels in 2018 returned to more historic levels. Capital expenditures did not have a material impact on O&M costs.

System Access (SA)

SA expenditures in 2018 were slightly below those in 2017 mainly due to fewer customer connections.

System Renewal (SR)

The decrease in 2018 SR expenditures was due to pacing of the 4.16 kV line renewal expenditures over the last two years of the program. The program was completed at the end of 2019.

System Service (SS)

SS investments deferred from previous years due to the LRT project were completed in 2018. This included expenditures in Grid Modernization and a Contingency Enhancement project (tie line between feeders) both deferred from 2016.

General Plant (GP)

GP spending levels in 2018 were lower due to decreased expenditures in new Information Technology systems.

4.3.2.3. Variance in Capital Expenditures (2018-2019)

Table 4-10: 2018 - 2019 Capital Variances by Investment Category

OEB Investment Category					Historical Average	Variance to Historical Average
	2018	2019	2019 - 2018		2016 - 2020	2019 - Avg.
	Actual	Actual	Variance	% Diff		Variance
System Access	$ 6,091,460	$ 6,243,182	$ 151,722	2.5%	$ 8,420,094	$ (2,176,912)
System Renewal	$ 8,423,589	$ 9,438,714	$ 1,015,125	12.1%	$ 8,751,491	$ 687,223
System Service	$ 1,822,412	$ 2,449,054	$ 626,642	34.4%	$ 1,755,873	$ 693,181
General Plant	$ 2,030,139	$ 1,810,228	$ (219,911)	-10.8%	$ 2,389,564	$ (579,336)
Gross CAPEX	$ 18,367,600	$ 19,941,178	$ 1,573,578	8.6%	$21,317,023	$ (1,375,844)
Contributed Capital	$ 2,968,930	$ 2,110,939	$ (857,991)	-28.9%	$ 4,872,076	$ (2,761,137)
Net CAPEX	$ 15,398,670	$ 17,830,239	$ 2,431,569	15.8%	$16,444,947	$ 1,385,292

Overall gross CAPEX increased 8.6%. Capital contributions declined resulting in an increase in net CAPEX of 15.8%. Capital expenditures did not have a material impact on O&M costs.

System Access (SA)

Variance is below materiality.

System Renewal (SR)

The 2019 increase in expenditures was in part due to a major renewal of overhead lines emanating from the Scheifele Transformer Station. The project involved live line relocation of multi-circuit lines while also maintaining sufficient circuit capacity out of the station. The project took longer than expected. WNH also found through inspection, segments of rural line with failing conductor that were prioritized for replacement due to safety concerns.

System Service (SS)

The increase in expenditures was due to two projects. One was a contingency enhancement project ($373,000) that had been deferred since 2015 due to delays by the Region of

Waterloo in completing the required road works project. The other was a grid modernization project, SCADA FLISR project ($184,000) initiated to improve WNH’s reliability.

General Plant (GP)

Fleet expenditures were lower by ($190,000) due to the deferral of a vehicle purchase.

4.3.2.4. Variance in Capital Expenditures (2019-2020)

Table 4-11: 2019 - 2020 Capital Variances by Investment Category

OEB Investment Category					Historical Average	Variance to Historical Average
	2019	2020	2020 - 2019		2016 - 2020	2020 - Avg.
	Actual	Forecast	Variance	% Diff		Variance
System Access	$ 6,243,182	$ 5,839,159	$ (404,023)	-6.5%	$ 8,420,094	$ (2,580,935)
System Renewal	$ 9,438,714	$ 8,612,076	$ (826,638)	-8.8%	$ 8,751,491	$ (139,415)
System Service	$ 2,449,054	$ 2,198,991	$ (250,063)	-10.2%	$ 1,755,873	$ 443,118
General Plant	$ 1,810,228	$ 3,554,579	$ 1,744,351	96.4%	$ 2,389,564	$ 1,165,015
Gross CAPEX	$ 19,941,178	$ 20,204,805	$ 263,627	1.3%	$ 21,317,023	$ (1,112,218)
Contributed Capital	$ 2,110,939	$ 2,065,806	$ (45,133)	-2.1%	$ 4,872,076	$ (2,806,270)
Net CAPEX	$ 17,830,239	$ 18,138,999	$ 308,760	1.7%	$ 16,444,947	$ 1,694,052

Overall gross CAPEX is expected to increase by 1.3%. Capital contributions are expected to decrease 2.1% resulting in an increase in net CAPEX of 1.7%. Capital expenditures did not have a material impact on O&M costs.

System Access (SA)

Decrease in SA expenditures is expected due to a decrease in customer driven work, namely connections and line expansions.

System Renewal (SR)

2020 SR expenditures are lower due to WNH completing its 4.16 kV line renewal program in 2019.

System Service (SS)

SS expenditures in 2019 were higher than normal due to two projects provided in the 2018-2019 SS variance analysis. The reduction in expenditure in 2020 was mainly due to the completion of a contingency enhancement project.

General Plant (GP)

Historical GP expenditures averaged $2.39 million annually. GP expenditures in 2020 are $3.55 million, an increase of $1.74 million (96%) over 2019.

The increases occur in three areas;

1) $747,000 increase in Information Technology System changes and Improvements.
   a) In response to customer feedback received in 2019 WNH adjusted the direction of our Information Technology capital investments to align to what our customers stated they value most. The adjustments made include:

      An increase in capital spending towards our customer facing systems by $134,000 in 2020 for the implementation of additional communications requested by customers including:
      i) outage notifications;
      ii) pro-active high bill alerts;
      iii) payment reminders; and
      iv) campaigns around electrical safety.
   b) An increase of $321,000 for CIS enhancements (Customer requested features)
      i) E-Billing;
      ii) Consolidated / summary billing for commercial customers;
      iii) Self-service online tools (interactive website, online chat, comparing usage within a customer's area).
   c) Vendor mandated Smart Meter System (RNI4.X) upgrade. ($192,000)
   d) New WNH website with enhanced customer features. ($71,000).
2) Increase in MS/DS disposal costs. ($574,000)

   WNH retired from service the last five of its 4.16 kV municipal stations and two of its 8.32 kV stations. One more 8.32 kV station is planned for retirement by the end of 2020. WNH is currently in a process to determine the highest and best use for the sites and expects to move forward in 2020 with structure demolition, environmental remediation and disposal.

3) $354,000 increase in Fleet expenditures

Fleet expenditures have historically averaged $760,000 annually (2010 – 2018). WNH attempts to pace these investments as much as possible. Expenditures in 2019 were well below this average at $369,000. Although expected 2020 expenditures are materially higher than 2019, they still remain below the historical average.

4.3.3. Historical Period Variance Analysis - Year to Plan

Previously presented, **Table 4-5** provides a summary of WNH's capital plan (OEB approved after adjustments) and actual expenditures from 2016 to 2020. Also included are WNH's actual and forecast operating and maintenance expenditures over the same period. This table contains the information required by Chapter 2, **Appendix 2-AB**. **Figure 4-5** illustrates the relationship between capital expenditures and O&M from 2016 to 2020.

The following section provides more detailed information of historical Year to Plan variances.

4.3.3.1. Historical Variance Analysis - Year to Plan (2016)

Table 4-12: 2016 Capital Variance – Year to Plan

OEB Investment Category	Plan	Actual	Variance	% Variance to Plan	Historical Average	% Variance to Historical Average
	2016	2016	Act - Plan		2016 - 2020	
System Access	$ 11,171,628	$ 17,628,164	$ 6,456,536	57.8%	$ 8,420,094	76.7%
System Renewal	$ 7,360,065	$ 7,801,178	$ 441,113	6.0%	$ 8,751,491	5.0%
System Service	$ 2,405,950	$ 1,742,066	$ (663,884)	-27.6%	$ 1,755,873	-37.8%
General Plant	$ 1,869,078	$ 2,288,204	$ 419,126	22.4%	$ 2,389,564	17.5%
Gross CAPEX	$ 22,806,721	$ 29,459,613	$ 6,652,892	29.2%	$21,317,023	31.2%
Contributed Capital	$ 6,372,310	$ 12,636,204	$ 6,263,894	98.3%	$ 4,872,076	128.6%
Net CAPEX	$ 16,434,411	$ 16,823,409	$ 388,998	2.4%	$16,444,947	2.4%

Variance analysis between 2016 plan and actual shows that actual capital expenditures exceeded the plan by approximately $6.7 million (29.2%). This is due largely to the expanded scope of work WNH experienced during the Waterloo Region Light Rail Transit (LRT) project.

Capital contributions also exceeded the plan by approximately $6.3 million (98.3%) as most of the expanded scope of work involved System Access work. WNH recovered approximately 72% of LRT capital expenditures.

The resulting net capital expenditures were $388,998 or (+2.4%) above planned.

System Access (SA)

SA expenditures in 2016 were abnormally high due to the LRT project. The scope of work for the LRT project increased significantly between the formation of the plan and its execution in 2016. Correspondingly the capital contributions associated with this work were also higher.

System Renewal (SR)

WNH experienced an ice storm in March of 2016 adding approximately $350,000 in unplanned SR expenditures.

System Service (SS)

WNH deferred some SS investments in order to meet the mandated timelines of the LRT project and to help pace overall capital expenditures.

General Plant (GP)

Asset Management Software ($277,000) was deferred from 2016 to 2019 due to WNH not being able to find a cost effective solution in the market place.

Work began on decommissioning and environmental remediation of Municipal Stations removed from service ($488,000). This work had been originally planned for 2017.

WNH had canvased the marketplace and could not find existing CIS systems that were reasonably priced and adequately addressed the Ontario Utility environment. WNH partnered with a local software vendor to develop a made in Ontario solution that would be

- efficient to operate and maintain
- more user friendly than the previous system
- able to be modified by in house staff in a cost effective manner
- flexible enough to respond to Public Policy changes in a timely and cost effective manner.
- have lower maintenance and licencing costs

Although the vendor had experience in the private sector, the initial cost estimates did not adequately reflect the complexity of the regulated electricity market in Ontario. In 2016, expenditures for WNH’s new CIS were $352,000 higher than planned.

4.3.3.2. Historical Variance Analysis - Year to Plan (2017)

Table 4-13: 2017 Capital Variance – Year to Plan

OEB Investment Category	Plan	Actual	Variance	% Variance to Plan	Historical Average	% Variance to Historical Average
	2017	2017	Act - Plan		2016 - 2020	
System Access	$ 7,520,910	$ 6,298,503	$ (1,222,407)	-16.3%	$ 8,420,094	-14.5%
System Renewal	$ 10,001,084	$ 9,481,900	$ (519,184)	-5.2%	$ 8,751,491	-5.9%
System Service	$ 1,680,000	$ 566,843	$ (1,113,157)	-66.3%	$ 1,755,873	-63.4%
General Plant	$ 2,813,765	$ 2,264,671	$ (549,094)	-19.5%	$ 2,389,564	-23.0%
Gross CAPEX	$ 22,015,759	$ 18,611,917	$ (3,403,842)	-15.5%	$ 21,317,023	-16.0%
Contributed Capital	$ 2,352,000	$ 4,578,501	$ 2,226,501	94.7%	$ (2,705,106)	-82.3%
Net CAPEX	$ 19,663,759	$ 14,033,416	$ (5,630,343)	-28.6%	$ 24,022,128	-23.4%

System Access (SA)

The Region of Waterloo moderated their spending after the LRT projects. Two major overhead line relocation projects totaling $910,000 planned for 2017 were deferred into later years. Also approximately $400,000 in planned underground feeder expansions were also deferred.

System Renewal (SR)

The System Renewal program for the 4.16 kV system in Elmira was delayed due to a longer than expected public consultation period. WNH also deferred some projects into 2018 to mitigate the rate impact of the LRT project.

System Service (SS)

WNH deferred projects involving reclosers and tie lines into 2018 to mitigate the rate impact of the LRT project.

General Plant (GP)

Expenditures in the amount of $450,000 for the ERP project were deferred to mitigate the rate impact of the LRT project.

4.3.3.3. Historical Variance Analysis - Year to Plan (2018)

Table 4-14: 2018 Capital Variance – Year to Plan

OEB Investment Category	Plan	Actual	Variance	% Variance to Plan	Historical Average	% Variance to Historical Average
	2018	2018	Act - Plan		2016 - 2020	
System Access	$ 6,020,046	$ 6,091,460	$ 71,414	1.2%	$ 8,420,094	0.8%
System Renewal	$ 9,438,200	$ 8,423,589	$ (1,014,611)	-10.8%	$ 8,751,491	-11.6%
System Service	$ 1,725,200	$ 1,822,412	$ 97,212	5.6%	$ 1,755,873	5.5%
General Plant	$ 1,661,176	$ 2,030,139	$ 368,963	22.2%	$ 2,389,564	15.4%
Gross CAPEX	$ 18,844,622	$ 18,367,600	$ (477,022)	-2.5%	$ 21,317,023	-2.2%
Contributed Capital	$ 1,902,000	$ 2,968,930	$ 1,066,930	56.1%	$ (2,949,422)	-36.2%
Net CAPEX	$ 16,942,622	$ 15,398,670	$ (1,543,952)	-9.1%	$ 24,266,445	-6.4%

System Access (SA)

Variance below materiality.

System Renewal (SR)

WNH deferred the planned replacement of a 1947 Distribution Station transformer, then 71 years old, for a savings of $720,000. Based on condition, performance and backup capabilities, the asset has been allowed to remain in service. The transformer will now be replaced with a surplus unit being recovered in 2021 from a decommissioned station.

The remaining expenditures in the amount of $295,000 were deferred to mitigate the rate impact of the LRT project.

System Service (SS)

Variance below materiality.

General Plant (GP)

CIS costs increased $250K above planned. Please refer to 4.3.4.1 General Plant for more detailed information.

4.3.3.4. Historical Variance Analysis - Year to Plan (2019)

Table 4-15: 2019 Capital Variance – Year to Plan

OEB Investment Category	Plan	Actual	Variance	% Variance to Plan	Historical Average	% Variance to Historical Average
	2019	2019	Act - Plan		2016 - 2020	
System Access	$ 5,946,859	$ 6,243,182	$ 296,323	5.0%	$ 8,420,094	3.5%
System Renewal	$ 8,800,764	$ 9,438,714	$ 637,950	7.2%	$ 8,751,491	7.3%
System Service	$ 1,175,404	$ 2,449,054	$ 1,273,650	108.4%	$ 1,755,873	72.5%
General Plant	$ 1,670,309	$ 1,810,228	$ 139,919	8.4%	$ 2,389,564	5.9%
Gross CAPEX	$ 17,593,336	$ 19,941,178	$ 2,347,842	13.3%	$ 21,317,023	11.0%
Contributed Capital	$ 1,902,000	$ 2,110,939	$ 208,939	11.0%	$ (1,375,844)	-15.2%
Net CAPEX	$ 15,691,336	$ 17,830,239	$ 2,138,903	13.6%	$ 22,692,867	9.4%

System Access (SA)

Customer connection costs increased by approximately $300,000. Intensification development in the urban area required more underground servicing with transformer vault rooms and below grade switching. These installations are considerably more expensive than historical commercial services.

System Renewal (SR)

The Leaside Dr. project in Waterloo, was planned as a short #4 backlot overhead rebuild however due to technical difficulties during design, it could not be completed overhead. Instead, a front line underground conversion was required at additional cost ($190,000).

Completion of secondary conductor replacement and restoration work for 4.16 kV underground cable replacement in Elmira ($160,000).

During residential underground renewal work in Lakeshore North subdivision, WNH discovered areas where secondary service conductor was prematurely failing (conductor insulation embrittlement). The unplanned replacement required an increase in the scope of work ($350,000).

System Service (SS)

The increase in expenditures was due the completion of a contingency enhancement project ($373,000) that had been deferred since 2015 due to delays by the Region of Waterloo in completing the required road works project.

Other projects contributing to the increase include the continuation of the SCADA FLISR project ($184,000), Cyber Security upgrades ($106,000), TS upgrades which included Online DGA, IR Windows, maintenance free breather ($205,000), and the King St tie lines ($475,000), which needed to be coordinated with a Region of Waterloo road project.

General Plant (GP)

Variance is below materiality.

4.3.4. Capital Project Variance – Plan to Actual (2016) (5.4.2)

This section provides a variance analysis for 2016 approved capital expenditures to actual expenditures by project/program. **Table 4-16a** and **Table 4-16b** provide a year to plan variance analysis, by project/program, for the previous test year of 2016. The threshold of materiality was $175,000 in 2016. Overall expenditures in 2016 were $6.65 million or 29% over plan. The following provides a detailed examination of the variances.

Table 4-16a: Capital Variance by Project – Year to Plan (2016)

Projects	2016 as Filed	2016 As Settled (Plan)	2016 ACTUAL	Variance ($)	Variance (%)
System Renewal					
Overhead Line Renewal	431,911	17,911	179,585	161,674	903%
Underground Line Renewal	809,117	809,117	1,536,029	726,912	90%
Overhead Line Renewal - Failing Conductor	1,139,381	1,139,381	30,618	-1,108,763	-97%
Overhead Line Renewal (8 kV)	1,841,523	1,434,557	1,514,370	79,813	6%
Overhead Line Renewal (4 kV)	1,904,888	1,904,888	2,567,003	662,115	35%
Overhead Line Refurbishment	484,953	484,953		-484,953	-100%
Reactive Renewal	228,539	228,539	716,905	488,366	214%
Proactive Renewal	763,432	763,432	680,965	-82,467	-11%
Station Equipment Renewal	193,611	193,611	160,631	-32,980	-17%
Miscellaneous/Other	383,676	383,676	415,072	31,396	8%
Sub-Total	8,181,031	7,360,065	7,801,178	441,113	6%
System Access					
Non-PSWHA Relocations	2,093,792	5,336,159	10,857,104	5,520,945	103%
PSWHA Relocations	909,037	2,215,440	1,603,936	-611,504	-28%
Customer Connections	2,257,764	2,257,764	3,165,396	907,632	40%
Expansions (Subdivisions)	593,795	593,795	967,227	373,432	63%
Expansions (Lines)	0	0	313,048	313,048	
Retail Meters	587,619	587,619	464,804	-122,815	-21%
Miscellaneous/Other	180,851	180,851	256,650	75,799	42%
Sub-Total	6,622,858	11,171,628	17,628,164	6,456,536	58%

Table 4-16b: Capital Variance by Project – Year to Plan (2016)

Projects	2016 as Filed	2016 As Settled (Plan)	2016 ACTUAL	Variance ($)	Variance (%)
System Service					
Contingency Enhancement	808,832	808,832	282,615	-526,217	-65%
Grid Modernization	1,157,168	1,157,168	1,133,013	-24,155	-2%
Grid Resiliency	0	0	0	0	
Stations Equipment Upgrades	0	0	46,760	46,760	
Miscellaneous/Other	439,950	439,950	279,679	-160,271	-36%
Sub-Total	2,405,950	2,405,950	1,742,066	-663,884	-28%
General Plant					
Fleet - Trucks	454,513	454,513	406,938	-47,575	-10%
IT Asset Lifecycle		0	111,028	111,028	
IT System Changes and Improvements		0	73,514	73,514	
IT New Systems and Services	655,491	655,491	697,082	41,591	6%
OT Software		0	76,913	76,913	
Building & Furniture Improvements		0	175,148	175,148	
MS/DS Decommissioning		0	488,315	488,315	
Miscellaneous/Other	759,074	759,074	259,266	-499,808	-66%
Sub-Total	1,869,078	1,869,078	2,288,204	419,126	22%
Miscellaneous					
Total	19,078,917	22,806,721	29,459,613	6,652,892	29%
Less Renewable Generation Facility Assets and Other Non-Rate-Regulated Utility Assets *(input as negative)*			-488,315	-488,315	
Total	19,078,917	22,806,721	28,971,297	6,164,576	27%

Underground Line Renewal

The increase of $726,912 in 2016 capital expenditures was due to projects started in 2015 and carried over into 2016. Material projects included are:

- Alvin St. & Mackay Cres., a #4/#6 ACSR back-lot overhead line in Waterloo which had planned to be refurbished, but was converted to front-lot underground distribution once in detailed design ($274,000);
- the unplanned replacement of secondary conductors in an underground subdivision renewal project in Elmira. The conductor's poor condition was discovered during construction and required an increase in project scope, cost ($340,000) and schedule.

Overhead Line Renewal - Failing Conductor

The decrease of $1,108,763 was due to projects where to the engineering work was completed in 2016, however construction started later in the year and carried over into 2017. Material projects included are:

- Buehler Ln overhead renewal ($579,000), the project was designed, however as the LRT scope of work was expanded, a reassessment of the condition of the line determined the construction could be deferred into 2017 to ease 2016 workload and capital expenditures;
- Renewal of overhead lines in Conestogo was delayed due to coordination issues with Region of Waterloo road works on Sawmill Rd ($330,000);
- Renewal of overhead lines on Church St at Spruce Ln in Elmira ($98,000) delayed due to schedule changes and coordination issues with Region of Waterloo road works.

Overhead Line Renewal (4 kV)

The increase of $662,115 was for the most part due to planned overhead line refurbishment work ($484,953) changing scope into a full rebuild triggered by asset condition. There is an offsetting amount of (- $484,953) in **Table 4-16a**, under 2016 Overhead Line Refurbishment, 2016 actuals.

The remaining amount of the increase ($137,162) is due to an number of small increases in projects in this program.

Overhead Line Refurbishment

The decrease of $484,953 was due to change of scope of projects in this program. Please refer to the Overhead Line Renewal (4 kV) program above.

Reactive Renewal

The increase in expenditures of $488,366 was mostly driven by ice and wind storms experienced in 2016.

Adverse weather events in 2016 numbered 68 events and accounted for 58% of the total C.M.I. This was the worst year over the historical period for adverse weather events.

In March 2016, a wide spread freezing rain storm impacted about 17,000 or 30% of WNH's customers. March 24th, 25th and 26th were major event days with a 3-day subtotal of 5,521,516 C.M.I. or 99% of the Adverse Weather interruptions for 2016.

Non-PSWHA Relocations

The increase of $5,520,945 was due to three projects:

- the expanding scope of work for the LRT project; ($3,737,895)
- an overhead line relocation project on Erb St in Waterloo, driven by a new development that ultimately required undergrounding of the line; ($585,749)
- an overhead line to underground burial project on Caroline St in Waterloo at the request of the City of Waterloo. ($567,520) Originally budgeted under PSWHA Relocations.
- sections of a road relocation project on Columbia St in Waterloo where an overhead line to underground burial was required. ($629,781)

PSWHA Relocations

The underspending of $611,504 in the program was due to three major factors:

1. An overhead line relocation project ($1,636,280) on Erb St in Waterloo, driven by a new commercial development and the Region of Waterloo, changed scope from the original plan. Originally the total amount was budgeted under this program. The work was eventually completed with an overall lower expenditure with ($92,286) being charged under this program and ($585,749) under the non-PSWHA Relocations program previously mentioned.

2. The Region of Waterloo deferred a number of road works projects into 2017 due to the challenges they were experiencing with the amount of LRT activity. These projects included:

   - Bridgeport Rd/Caroline St, King St to Erb St ($237,956). Deferred by Region due to road closure conflicts with nearby LRT Project;
   - University Ave, Keats Way to Erb St ($18,118). WNH portion of this project in 2016 was design only. Deferred by Region due to WNH's LRT workload;
   - Westmount Rd, John St to Erb St ($96,997). Deferred by Region;
   - Sawmill Rd, River St to Snyder's Flat's Rd, Bloomingdale ($90,228). Deferred by Region;
   - Sawmill & Katherine ($135,861). Deferred by Region.

3. Additional unplanned relocation requests were received from the City of Waterloo (3) and the Township of Woolwich (1).

   - Columbia St. W. - Erbsville Rd to Fischer-Hallman Rd ($523,346)
   - King St. Phase 2 Henry St. to Front St. St Jacobs ($461,772)
   - Woolwich St, University Ave E to Kiwanis Park Rd, Relocation ($333,963)
   - Ira Needles Blvd. and Thorndale Dr. pole relocations ($136,306)
   - Erb St at IRA Needles, pole line relocation ($92,286)

The result was a total capital expenditure of $1.60 million with an underspend of $611,504 from the original plan.

Customer Connections

The increase of ($907,632) was due to:

- an increase in scope in the LRT project which required their power stations to have dual redundant connections ($350,000);
- new commercial services requiring underground vista switching units due to pole congestion ($400,000);
- Make-ready work for 3rd party attachment changes due to LRT ($100,000)

Expansions (Subdivisions)

The increase of $373,432 was due to the increased number of subdivision lots requested to be serviced by developers.

Expansions (Lines)

The increase of $313,048 was due to several smaller unplanned expansion projects (all under $100,000) requested by customers. The larger ones being:

- Homestead & Zinger Villa, Maryhill, 1ph to 3ph pole line expansion, ($97,278);
- Erb St West, underground feeder ($65,418);
- West end Subdivision 600A trunk ($60,114);
- Double Bend Lane, Woolwich ($38,432);
- Platinum Dr., Waterloo, ($33,310).

Contingency Enhancement

The decrease of $526,217 was due to an intentional deferral of two projects to meet mandated timelines of the LRT project and help pace capital expenditures.

- Northfield Dr., Westmount Rd to Weber St – design started only
- Huntsberger Rd, Golf Course Rd to Katherine St – design started only

Building & Furniture Improvements

The increase of $175,148 was due to several small unplanned expenditures. These were all non-material projects.

MS/DS Decommissioning

The increase of $488,315 resulted from environmental remediation work for 8 former municipal station sites originally planned for 2017 brought forward into 2016. Work on various sites had started in 2014 and progressed into 2015. As the LRT work increased WNH looked for opportunities to defer work into 2017. As the scope of the environmental work increased during the latter part of 2015, it was no longer considered prudent to defer the work into 2017 and leave the sites unfinished. There was also the risk that the delay in the applications to the Ministry of the Environment and Climate Change would require rework and added cost.

Miscellaneous/Other

The decrease of $499,808 in this category comes from individual projects under the threshold of materiality being consolidated under various other capital programs.

A completed **Appendix Table 2-AA** - Capital Expenditure Summary from the OEB Chapter 5 Consolidated Distribution System Plan Filing Requirements, is provided in **Appendix R** - OEB Chapter 2 Appendix 2-AA.

WNH's accounting policy is to expense borrowing costs. It does not capitalize interest on capital projects unless they meet the IFRS criteria of a qualifying asset which is defined in the Board's Report of the Board EB-2008-0408 Transition to International Financial Reporting Standards, June 28, 2009 as "an asset that necessarily takes a substantial period of time to get ready for its intended use or sale." WNH does not have any capitalized borrowing costs forecast in its 2020 Bridge or 2021 Test Years. WNH capitalized $330,976 in the 2011 Historical Year on the construction of WNH's Service Centre and Administration Building.

There are no expenditures for non-distribution activities in the WNH's budget.

4.3.5. Forecast Period Capital Expenditures - Year to Year

4.3.5.1. Variance in Capital Expenditures, 2020-2021 (Forecast)

Table 4-17: 2020 - 2021 Capital Variances by Investment Category

OEB Investment Category					Historical Average	Variance to Historical Average
	2020	2021	2021 - 2020		2016 - 2020	2020 – Avg.
	Budget	Budget	Variance	% Diff		Variance
System Access	$ 5,839,159	$ 5,840,262	$ 1,103	0.0%	$ 8,420,094	$ (2,579,832)
System Renewal	$ 8,612,076	$ 8,095,769	$ (516,307)	-6.0%	$ 8,751,491	$ (655,722)
System Service	$ 2,198,991	$ 2,293,605	$ 94,614	4.3%	$ 1,755,873	$ 537,732
General Plant	$ 3,554,579	$ 2,818,876	$ (735,703)	-20.7%	$ 2,389,564	$ 429,312
Gross CAPEX	$ 20,204,805	$ 19,048,512	$ (1,156,293)	-5.7%	$ 21,317,023	$ (2,268,511)
Contributed Capital	$ 2,065,806	$ 2,642,394	$ 576,588	27.9%	$ 4,872,076	$ (2,229,682)
Net CAPEX	$ 18,138,999	$ 16,406,118	$ (1,732,881)	-9.6%	$ 16,444,947	$ (38,829)

Overall WNH is planning a reduction in 2021 capital expenditures of $1.16 million (5.7%) over 2020. Referencing **Table 4-7**, 2021 capital expenditures are also $232,863 below the 2017–2020 annual average.

System Access (SA)

There is no material variance in expenditures between 2020 and 2021.

System Renewal (SR)

For 2021, Station Equipment Renewal (-$371,538) accounts for the majority of the reduction. There are also smaller reductions in Proactive and Reactive renewal expenditures forecast for 2021.

System Service (SS)

There is no material variance in expenditures between 2020 and 2021.

General Plant (GP)

For 2021, a material reduction in Information Technology investments (-$748,591) accounts for the reduction.

4.3.5.2. Capital Expenditures, 2021-2025 (Forecast)

Table 4-18 provides a summary of forecast expenditures from 2021–2025. The key elements of WNH investment plans over the forecast period are in the areas of System Renewal and System Access. Over the entire forecast period these two categories account for 78% of total planned investments.

Table 4-18: Forecast Expenditures 2021 – 2022

OEB Investment Category	Test Year	Forecast Period				Average Annual Investment	% Average Annual Investment
	2021	2022	2023	2024	2025	2021-2025	2021-2025
System Access	$ 5,840,262	$ 6,166,099	$ 6,305,421	$ 6,447,529	$ 6,592,480	$ 6,270,358	31.5%
System Renewal	$ 8,095,769	$ 9,371,995	$ 9,548,434	$ 9,693,203	$ 9,951,367	$ 9,332,154	46.8%
System Service	$ 2,293,605	$ 1,346,209	$ 1,288,333	$ 1,211,460	$ 1,211,589	$ 1,470,239	7.4%
General Plant	$ 2,818,876	3,567,432	$ 3,593,891	$ 2,062,637	$ 2,221,975	$ 2,852,962	14.3%
Gross CAPEX	$ 19,048,512	$ 20,451,734	$ 20,736,079	$ 19,414,828	$19,977,411	$ 19,925,713	100.0%
Contributed Capital	$ 2,642,394	$ 2,709,839	$ 2,764,036	$ 2,819,317	$ 2,875,703	$ 2,762,258	13.9%
Net CAPEX	$ 16,406,118	$ 17,741,894	$ 17,972,043	$16,595,512	$17,101,708	$ 17,163,455	
O&M	$ 8,213,832	$ 8,378,108	$ 8,545,670	$ 8,716,584	$ 8,890,916	$ 8,549,022	

Table 4-19 provides a comparison of average annual expenditures over the historical and forecast years. Two averages are provided for the historical period, one including the impact of LRT (2016) and one without (2017). Annual average capital expenditures from 2021 to 2025 are forecast to be approximately 3.3% higher than historical. Contributed capital is also forecast to decline by 5.8%.

Capital expenditures in 2022 and 2023 are elevated over 2021 due to WNH's investment in a new Enterprise Resource Planning Software (ERP) system. More information is provided later in **Section 2.1.1.3.**

Grid modernization investment needs decrease after 2021 and System Service capital expenditures levels drop to below historic levels. Also refer to **Section 4.1.1** for more information.

Table 4-19: Historical and Forecast Average Expenditures

OEB Investment Category	Annual Historical Average	Annual Historical Average(1)	Annual Forecast Average	Annual Forecast - Historical (2016)	% Average Annual Investment (2016)	Annual Forecast - Historical (2017)	% Average Annual Investment (2017)
	2016 - 2020	2017 - 2020	2021 - 2025	Variance	Forecast / Historical	Variance	Forecast / Historical
System Access	$ 8,420,094	$ 6,118,076	$ 6,270,358	$ (2,149,736)	-25.5%	$ 152,282	2.5%
System Renewal	$ 8,751,491	$ 8,989,070	$ 9,332,154	$ 580,662	6.6%	$ 343,084	3.8%
System Service	$ 1,755,873	$ 1,759,325	$ 1,470,239	$ (285,634)	-16.3%	$ (289,086)	-16.4%
General Plant	$ 2,389,564	$ 2,414,904	$ 2,852,962	$ 463,398	19.4%	$ 438,058	18.1%
Gross CAPEX	$ 21,317,023	$ 19,281,375	$ 19,925,713	$ (1,391,310)	-6.5%	$ 644,338	3.3%
Contributed Capital	$ 4,872,076	$ 2,931,044	$ 2,762,258	$ (2,109,818)	-43.3%	$ (168,786)	-5.8%
Net CAPEX	$ 16,444,947	$ 16,350,331	$ 17,163,455	$ 718,508	4.4%	$ 813,124	5.0%
O&M	$ 7,715,999	$ 7,804,294	$ 8,549,022	$ 833,023	10.8%	$ 744,728	9.5%

4.4. (5.4.3) Justifying Capital Expenditure

This section provides information and analysis in support of WNH's investment plans and this DSP. References to previous sections of the DSP will be provided as necessary. Due to the timing of the filing, actual expenditures for 2020 could not be provided.

4.4.1. (5.4.3.1) Overall Plan

- *To support the overall quantum of investments included in a DSP by category, a distributor should include information on:*
- *Comparative expenditures by category over the historical period*
- *The forecast impact of system investment on system O&M costs, including on the direction and timing of expected impacts*
- *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)*
- *Information related to the distributor's system capability assessment (see section 5.3.4)*

4.4.1.1. Comparative Expenditures over the Historical Period

Comparative expenditures by category over the historical period can be found in **Table 4-5** Historical & Forecast Expenditures (000's) 2016-2025 (**Appendix 2-AB**). Additional information can be found in:

- **Section 2.3.7** Unit cost metrics for capital expenditures and O&M
- **Section 4.1.1** Capital Expenditures over the Forecast Period
- **Section 4.3** Capital Expenditure Summary

4.4.1.2. Forecast Impact of System Capital Investment on System O&M costs

Historical O&M costs increased on average by 1.8% annually between 2016 and 2020. WNH forecasts O&M costs to increase by 2% annually from 2021 – 2025. This is not unexpected as work programs similar to the forecast period and inflationary pressures continue to place upward pressure on O&M cost inputs.

Asset additions that have or will occur during the 2016 – 2020 period will add to the inspection and maintenance programs placing upward pressure on O&M expenditures. These additions come from new load connections, generation connections, and expansions.

Even though Renewal investments replace of end-of-life assets with new assets, they do not reduce the inspection requirements as set out by the OEB and IESO.

Annual Renewal replacements also typically only represent an incrementally small percentage of the existing asset base. Maintenance costs do not noticeably reduce either. To illustrate, WNH forecasts to replace approximately 500 poles or 2% annually out of a population of 21,807. As 2% of the new assets attract some savings, the remaining 98% are attracting more costs as they age and deteriorate. Certain assets, such as poles, and many electronic devices offer few opportunities for repair related activities and generally require replacement when deemed at end of normal life or critically damaged, thereby contributing little to a reduction in O&M.

WNH made some savings by purchasing lower maintenance equipment & systems such as solid dielectric reclosers and switches, gas insulated switchgear and protective relays. These savings tend to be incremental and are absorbed by inflationary cost increases.

New software systems such as WNH's CIS have lowered annual maintenance fees, reduced the manual efforts taken to deal with large amounts of data leading to productivity gains. These investments are also anticipated to be more user configurable, allowing for lower costs of ownership.

Relocation of existing assets normally results in older assets being replaced with newer ones, however quite often assets being relocated are not at end-of-life and not attracting substantial maintenance costs. Inspection costs will remain unchanged as inspections still need to be carried out on a periodic basis as required per the Distribution System Code. There will be some savings for periodic testing (i.e. pole testing), however the number of assets relocated annually is a small segment of the asset population. Overall, relocating assets are expected to have little impact on O&M costs.

WNH has implemented grid modernization devices and communications which allows for more information to be acquired and analyzed remotely with less labour resource input. Remote system reconfiguration utilizing SCADA controlled switching devices can be accomplished faster and with fewer truck rolls and labour input. However, these assets also attract additional O&M expenditures for inspection and maintenance.

Investments will be made in the decommissioning, remediation and sale of MS/DS properties retired as a functioning of WNH's System Renewal investments. Future O&M costs for these stations will be eliminated as well as the need to recapitalize these station investments.

Table 4-20 provides of summary of O&M drivers and their forecasted impact on O&M costs.

Table 4-20: O&M Drivers

O&M Drivers	Impact on Expenditures
Addition of assets	Increase
Aging of assets	Increase
Inflationary increase in labour equipment and materials	Increase
Renewal of assets	Neutral
Relocation of assets	Neutral
Public Responsiveness (Regulatory and Legislative)	Increase

These incremental upward and downward pressures on O&M are not tracked by WNH. Overall O&M is tracked and WNH attempts to be prudent with its expenditures. WNH's capital investment plans are not expected to have a significant impact on total O&M costs over the forecast period.

4.4.1.3. Drivers of Investment by OEB Category

Drivers of material capital investments are provided in detail in the following sections of this DSP.

- **Section 1.4** Background and Drivers
- **Section 2.1.1** Key elements of the DSP
- **Appendix H** - WNH Renewable Generation (REG) Investment Plan, Section 8

4.4.1.4. (5.3.4) Information related to WNH's system capability assessment

The capabilities of WNH's distribution system are presented in detail in the following sections of this DSP;

- **Section 1.3.8** Embedded Generation
- **Section 3.4** System Capability for REG (5.3.4)
- **Appendix H** WNH Renewable Generation (REG) Investment Plan, Section 5

4.4.2. (5.4.3.2) Material Investments

This section provides details for all 2021 projects/programs that meet or exceed the materiality threshold of $190,000. **Table 4-21** provides a break down of 2021 proposed expenditures by OEB category.

Table 4-21: Summary of 2021 Material Investments

OEB Investment Category	# Projects / Programs	Total $	% Total CAPEX	# Material Projects (> $ 190,000)	Total $	% Total CAPEX	% Total OEB Category
System Access	7	$ 5,840,262	31%	6	$ 5,729,032	30%	98%
System Renewal	8	$ 8,095,769	43%	6	$ 7,212,102	38%	89%
System Service	5	$ 2,293,605	12%	4	$ 1,807,067	9%	79%
General Plant	8	$ 2,818,876	15%	5	$ 2,058,117	11%	73%
Total	28	$19,048,512	100%	21	$ 16,806,318	88%	

Figure 4-9 provide a listing of 2021 material project/programs in order of level of expenditure.

Table 4-22 provides a listing of individual material project/programs by OEB category and priority ranking.

Individual detailed projects/program descriptions are provided in **Appendix B** - 2021 Material Capital Investments. Each description provides detailed information following the format presented in **Section 5.4.3.2** of the Chapter 5 filing requirements.

Figure 4-9: Material Projects/ Program Expenditures (2021)

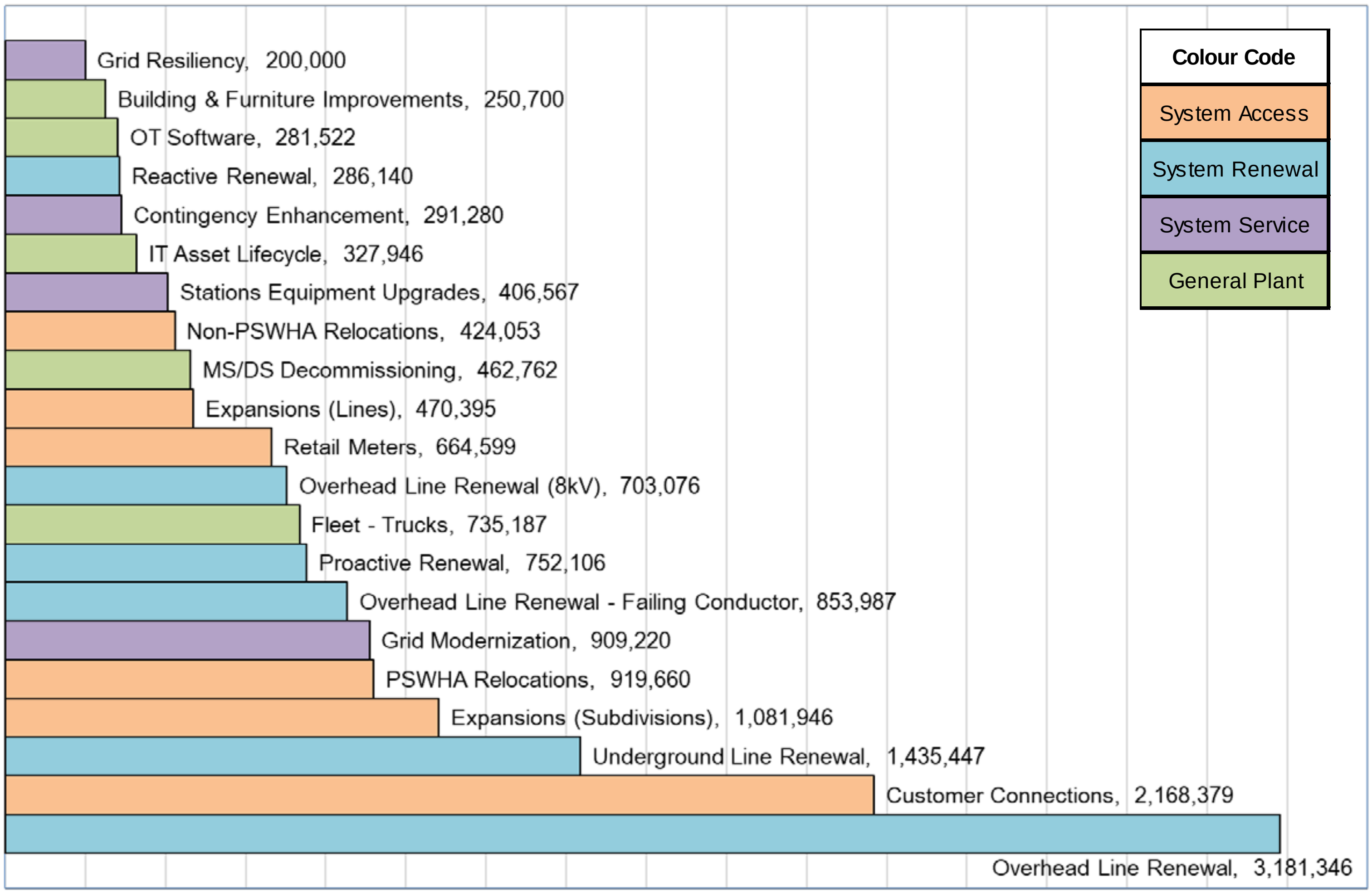


Table 4-22: 2021 Material Investments

OEB Category	Grouping #	Grouping Description	2021	Justification	Rank
System Access	21	Non-PSWHA Relocations	424,053	Mandated by regulation or code	1
System Access	22	PSWHA Relocations	919,660	Mandated by regulation or code	1
System Access	23	Customer Connections	2,168,379	Mandated by regulation or code	1
System Access	24	Expansions (Subdivisions)	1,081,946	Mandated by regulation or code	1
System Access	25	Expansions (Lines)	470,395	Mandated by regulation or code	1
System Access	28	Retail Meters	664,599	Mandated by regulation or code	1
System Renewal	7	Reactive Renewal	286,140	Immediate unplanned replacement - failure and/or high public safety risk	2
System Renewal	3	Overhead Line Renewal - Failing Conductor	853,987	Planned replacement ACA condition assessment and high public safety risk	3
System Renewal	8	Proactive Renewal	752,106	Unplanned replacement in current year - poor condition and/or high public safety risk	4
System Service	36	Stations Equipment Upgrades	406,567	Improve monitoring, security & safety	5
System Renewal	4	Overhead Line Renewal (8 kV)	703,076	Planned replacement ACA condition assessment and voltage conversion efficiencies	6
System Renewal	2	Underground Line Renewal	1,435,447	Planned replacement ACA condition assessment and voltage conversion efficiencies	7
System Renewal	1	Overhead Line Renewal	3,181,346	Planned replacement ACA condition assessment	8
System Service	32	Grid Modernization	909,220	Improving system operations, reliability & efficiencies	9
General Plant	51	IT Asset Lifecycle	327,946	Planned replacement - obsolescence, security	10
System Service	31	Contingency Enhancement	291,280	Improve system operations & reliability	11
General Plant	41	Fleet - Trucks	735,187	Planned replacement ACA condition assessment	12
General Plant	56	OT Software	281,522	Planned replacement - obsolescence & efficiencies	13
System Service	33	Grid Resiliency	200,000	Service Connection Reliability during inclement weather	14
General Plant	61	Building & Furniture Improvements	250,700	Planned replacement - obsolescence & condition	15
General Plant	66	MS/DS Decommissioning	462,762	CAPEX, O&M savings	16

(Page Intentionally left blank)