EXHIBIT 2 – RATE BASE & DSP

2021 Cost of Service

Wellington North Power Inc.
EB-2020-0061

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2.1 OVERVIEW OF RATE BASE

2.1.1 RATE BASE OVERVIEW

WNP converted to International Financial Reporting Standards ("MIFRS") on January 1, 2015, and has prepared this application under MIFRS. WNP confirms that there were no other changes that would affect the utility's net book value other than the implementation of new depreciation rates in 2013 which occurred before the last Cost of Service application (EB-2015-0110) was completed.

The net fixed assets used to determine the utility's Rate Base include those distribution assets associated with activities that enable the conveyance of electricity for distribution purposes. WNP does not have non-distribution assets nor does it conduct non-distribution activities. [1] Controllable expenses include operations and maintenance, billing and collecting and administration expenses which are discussed in detail in Exhibit 4.

WNP has calculated its' Test Year 2021 Rate Base to be $12,301,661. This rate base is also used to determine the proposed revenue requirement found in Exhibit 6. The table below presents WNP's Rate Base calculations for the Test Year compared to the 2016 Board Approved.

[1] MFR - Non-distribution activities - capital expenditures and reconciliation to total capital budget

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Table 1 - Test Year Rate Base

	MIFRS	MIFRS	
Particulars	**Last Board Approved**	**2021**	**Variance**
Net Capital Assets in Service:			
Opening Net Assets	7,683,811	11,228,623	3,544,812
Ending Net Assets	8,847,868	11,255,340	2,407,472
Average Balance	8,265,840	11,241,982	2,976,142
Working Capital Allowance	1,186,382	1,059,680	-126,702
Total Rate Base	**9,452,222**	**12,301,661**	**2,849,440**

	MIFRS	MIFRS	
Expenses for Working Capital	**Last Board Approved**	**2019**	**Variance**
Eligible Distribution Expenses:			
3500-Distribution Expenses - Operation	420,000	443,000	23,000
3550-Distribution Expenses - Maintenance	234,500	252,000	17,500
3650-Billing and Collecting	361,000	415,500	54,500
3700-Community Relations	7,000	7,500	500
3800-Administrative and General Expenses	697,500	797,000	99,500
LEAP Funding	2,909	3,500	591
Property Taxes	14,000	14,000	0
Total Eligible Distribution Expenses	1,736,909	1,932,500	195,591
3350-Power Supply Expenses	14,081,514	12,196,563	-1,884,951
Total Expenses for Working Capital	**15,818,423**	**14,129,063**	**-1,689,359**
Working Capital factor	7.5%	7.5%	0%
Total Working Capital	**1,186,382**	**1,059,680**	**-126,702**

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2.1.2 RATE BASE TREND

The Rate Base trend table presents WNP's Rate Base calculations for all required years including the Test Year 2021. Year-over-year variance analysis follows.

Table 2 - Rate Base Trend

	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS
Particulars	**Last Board Appr.**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Net Capital Assets in Service:							
Opening Net Assets	7,683,811	8,567,794	8,833,414	9,099,903	9,101,958	9,208,195	11,228,623
Ending Net Assets	8,847,868	8,833,414	9,099,903	9,101,958	9,208,195	9,633,096	11,255,340
Average Balance	8,265,840	8,700,604	8,966,659	9,100,931	9,155,077	9,420,646	11,241,982
Working Capital Allowance	1,186,382	1,072,290	998,190	962,922	989,802	1,048,105	1,059,680
Total Rate Base	**9,452,222**	**9,772,894**	**9,964,849**	**10,063,852**	**10,144,879**	**10,468,751**	**12,301,661**
	MIFRS	**MIFRS**	**MIFRS**	**MIFRS**	**MIFRS**	**MIFRS**	**MIFRS**
Expenses for Working Capital	**Last Board Approved**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Eligible Distribution Expenses:							
3500- - Operation	420,000	442,995	444,043	394,084	407,117	430,429	443,000
3550- - Maintenance	234,500	218,122	222,539	243,715	214,209	253,402	252,000
3650-Billing and Collecting	361,000	380,741	347,237	351,745	402,260	417,717	415,500
3700-Community Relations	7,000	8,794	6,835	9,833	7,370	5,458	7,500
3800-Admin. & General Expenses	697,500	693,403	697,404	713,859	788,126	790,494	797,000
LEAP	2,909	2,909	3,103	3,247	3,270	3,303	3,500
Property Taxes	14,000	13,493	13,282	12,892	12,560	14,000	14,000
Total Eligible Distribution Expenses	1,736,909	1,760,457	1,734,443	1,729,373	1,834,912	1,914,803	1,932,500
3350-Power Supply Expenses	14,081,514	12,536,742	11,574,763	11,109,584	11,362,446	12,059,931	12,196,563
Total Expenses for Working Capital	15,818,423	14,297,199	13,309,205	12,838,957	13,197,358	13,974,734	14,129,063
Working Capital factor	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Total Working Capital	**1,186,382**	**1,072,290**	**998,190**	**962,922**	**989,802**	**1,048,105**	**1,059,680**

The Rate Base for the 2021 Test Year has increased by $2,156,782 over the last actual (2019), and $2,849,440 above the last Board Approved Rate Base. The reason for the increase from the 2016 Cost of Service is mainly attributed to the following:

- **Major capital cost drivers: 2016**

  System Access:

  - Second Supply line to service Mount Forest: $838,765

Major capital cost drivers: 2017

General Plant:

- Pick-up Truck $37,499
- MIST Meter installation $45,381

Major capital cost drivers: 2018

System Access:

- Re-verification Meter Sampling + usual replacements $154,617
- Advanced Capital Module – MS3 substation project $1,692,893 (in account 1508.)

Major capital cost drivers: 2019

System Access:

- Completion of Meter re-verification + usual replacements $81,987

Major capital cost drivers: 2020

System Renewal:

- Purchase of Bucket truck (budgeted) $345,000
- IT/Cyber Security/Smart Grid Investments $148,000

Major capital cost drivers: 2021

System Renewal:

- MS3 Substation rebuild-completed 2018 with ACM $1,692,893
- IT/Cyber Security/Smart Grid Investments $136,400

Decreased Power Supply Expenses

WNP has forecasted a decrease in the 2021 Power Supply Expenses of $1,884,951 over its' 2016 Cost of Service. This is due to the Ontario Electricity Rebate credit of 31.8% being applied to Regulated Price Plan billing components in the Test Year 2021.

Increased Distribution Expenses

The 2021 forecast for OM&A reflects an increase of $195,591 from the 2016 Board Approved. The details of the increases in OM&A are provided in Exhibit 4; however the key drivers include:

- Increase in cyber-security costs;
- Increases to regulatory expenses; and
- Increase in wages.

The Working Capital Allowance has decreased by $126,702 over the 2016 Board Approved. The reason for the decrease from the 2016 Board Approved to the Test Year 2021 is due to the decrease in Power Supply Expenses.

Year-over-year variances are presented in the next section.

2.1.3 RATE BASE VARIANCE ANALYSIS

The following paragraphs and tables provide a narrative on the changes that have driven the increase in rate base since WNP's 2016 Board Approved Cost of Service Application.

Filing Requirements state that a distributor with a distribution revenue requirement less than $10 million may use $50,000 as a materiality threshold. WNP's 2021 proposed base revenue requirement is less than $10 million therefore the LDC has used $50,000 as a materiality threshold.

WNP has provided the following variance analysis to account for the change in the LDC's Rate Base:

- ✓ 2021 Test Year (MIFRS) against 2020 Bridge Year (MIFRS)
- ✓ 2020 Bridge Year (MIFRS) against 2019 Actual (MIFRS)
- ✓ 2019 Actual (MIFRS) against 2018 Actual (MIFRS)
- ✓ 2018 Actual (MIFRS) against 2017 Actual (MIFRS)
- ✓ 2017 Actual (MIFRS) against 2016 Actual (MIFRS)

2016 BOARD APPROVED VS. 2016 ACTUAL:

Table 3 – 2016 BA to 2016 Actual Rate Base Variance

	MIFRS	MIFRS		
Particulars	**Last Board Approved**	**2016**	**Var**	**%**
Net Capital Assets in Service:				
Opening Net Assets	7,683,811	7,704,837	21,026	0.27%
Ending Net Assets	8,847,868	8,833,414	(14,454)	-0.16%
Average Balance	8,265,840	8,269,126	3,286	0.04%
Working Capital Allowance	1,186,382	1,072,290	(114,092)	-9.62%
Total Rate Base	**9,452,222**	**9,341,416**	**(110,806)**	-1.17%
	MIFRS	**MIFRS**		
Expenses for Working Capital	**Last Board Approved**	**2016**	**Var**	**%**
Eligible Distribution Expenses:				
3500-Distribution Expenses - Operation	420,000	442,995	22,995	5.47%
3550-Distribution Expenses - Maintenance	234,500	218,122	(16,378)	-6.98%
3650-Billing and Collecting	361,000	380,741	19,741	5.47%
3700-Community Relations	7,000	8,794	1,794	25.62%
3800-Administrative and General Expenses	697,500	693,403	(4,097)	-0.59%
LEAP	2,909	2,909	-	-
Property Taxes	14,000	13,493	(507)	3.62%
Total Eligible Distribution Expenses	1,736,909	1,760,457	23,548	1.36%
3350-Power Supply Expenses	14,081,514	12,536,742	(1,544,772)	-10.97%
Total Expenses for Working Capital	15,818,423	14,297,199	(1,521,224)	-9.62%
Working Capital factor	7.5%	7.5%	-	0.00%
Total Working Capital	**1,186,382**	**1,072,290**	(114,092)	-9.62%

The total Rate Base in 2016 Actual of $9,341,416 was ($110,806) or -1.17% less than the 2016 Board Approved. The main reason for the variance is:

- Power Supply Expenses decreased significantly to decrease the working capital requirement by $114,092.

2016 ACTUAL VS. 2017 ACTUAL:

Table 4 - 2016-2017 Rate Base Variances

	MIFRS	MIFRS		
Particulars	**2016**	**2017**	**Var**	**%**
Net Capital Assets in Service:				
Opening Net Assets	7,704,837	8,833,414	1,128,577	14.65%
Ending Net Assets	8,833,414	9,099,903	266,488	3.02%
Average Balance	8,269,126	8,966,659	697,533	8.44%
Working Capital Allowance	1,072,290	998,190	(74,100)	-6.91%
Total Rate Base	**9,341,416**	**9,964,849**	623,433	6.67%
	MIFRS	**MIFRS**		
Expenses for Working Capital	**2016**	**2017**	**Var**	**%**
Eligible Distribution Expenses:				
3500-Distribution Expenses - Operation	442,995	444,043	1,048	0.24%
3550-Distribution Expenses - Maintenance	218,122	222,539	4,417	2.02%
3650-Billing and Collecting	380,741	347,237	(33,504)	-8.80%
3700-Community Relations	8,794	6,835	(1,958)	-22.27%
3800-Administrative and General Expenses	693,403	697,404	4,001	0.58%
LEAP	2,909	3,103	194	6.67%
Property Taxes	13,493	13,282	(212)	-1.57%
Total Eligible Distribution Expenses	1,760,457	1,734,443	**(26,014)**	-1.48%
3350-Power Supply Expenses	12,536,742	11,574,763	(961,979)	-7.67%
Total Expenses for Working Capital	14,297,199	13,309,205	(987,993)	-6.91%
Working Capital factor	7.5%	7.5%	-	0.00%
Total Working Capital	**1,072,290**	**998,190**	**(74,100)**	**-6.91%**

The total Rate Base in 2017 Actual of $9,964,849 was $623,433 or 6.67% greater than the 2016 Actual. The main reason for the variance is:

- The increase is mostly due to the difference between the opening asset balances for the two years. In 2016 there was the addition of a second 44kV feeder to Mount Forest in the amount of $1,308,427 (DSP examines this project in detail) and a total capital spend of $1,546,451.
- Power Supply Expenses continued to decrease and reduced the working capital by a further $74,100.

2017 ACTUAL VS. 2018 ACTUAL:

Table 5 - 2017-2018 Rate Base Variances

	MIFRS	MIFRS		
Particulars	**2017**	**2018**	**Var**	**%**
Net Capital Assets in Service:				
Opening Net Assets	8,833,414	9,099,903	266,488	3.02%
Ending Net Assets	9,099,903	9,101,958	2,056	4.77%
Average Balance	8,966,659	9,100,931	134,272	1.50%
Working Capital Allowance	998,190	962,922	(35,268)	-3.53%
Total Rate Base	**9,964,849**	**10,063,852**	**99,004**	0.99%
	MIFRS	**MIFRS**		
Expenses for Working Capital	**2017**	**2018**	**Var**	**%**
Eligible Distribution Expenses:				
3500-Distribution Expenses - Operation	444,043	394,084	(49,959)	-11.25%
3550-Distribution Expenses - Maintenance	222,539	243,715	21,176	9.52%
3650-Billing and Collecting	347,237	351,745	4,508	1.30%
3700-Community Relations	6,835	9,833	2,997	43.85%
3800-Administrative and General Expenses	697,404	713,859	16,455	2.36%
	3,103	3,247	144	4.64%
Property Taxes	13,282	12,892	(390)	-2.94%
Total Eligible Distribution Expenses	1,734,443	1,729,373	**(5,070)**	-0.29%
3350-Power Supply Expenses	11,574,763	11,109,584	(465,179)	-4.02%
Total Expenses for Working Capital	13,309,205	12,838,957	(470,249)	-3.53%
Working Capital factor	7.5%	7.5%	-	0.00%
Total Working Capital	**998,190**	**962,922**	**(35,268)**	**-3.53%**

The total Rate Base in 2018 Actual of $10,063,095 is $99,004 or 0.99% greater than 2017 Actual. The main reasons for the variance are:

- The increase is due to the difference between the opening asset balances for the two years. In 2017 there was the addition of a pick-up Truck, installation of "Metering Inside the Settlement Timeframe" (MIST) meters[2] and increased spending on Smart Meters to prepare for meter re-verification.
- Power Supply Expenses continued to decrease and reduced the working capital by a further $35,268.

[2] Section 5.1.3 of the DSC & EB-2013-011: A distributor shall (a) install a MIST meter on any new installation that is forecast by the distributor to have a monthly average peak demand during a calendar year of over 50 kW; and (b) have until August 21, 2020 to install a MIST meter on any existing installation that has a monthly average peak demand during a calendar year of over 50 kW.

2018 ACTUAL VS. 2019 ACTUAL:

Table 6 - 2018-2019 Rate Base Variances

Particulars	MIFRS 2018	MIFRS 2019	Var	%
Net Capital Assets in Service:				
Opening Net Assets	9,099,903	9,101,958	2,056	0.02%
Ending Net Assets	9,101,958	9,208,195	106,237	1.17%
Average Balance	9,100,931	9,155,077	54,146	0.59%
Working Capital Allowance	962,922	989,802	26,880	2.79%
Total Rate Base	**10,063,852**	**10,144,879**	**81,026**	**0.81%**
	MIFRS	**MIFRS**		
Expenses for Working Capital	**2018**	**2019**	**Var**	**%**
Eligible Distribution Expenses:				
3500-Distribution Expenses - Operation	394,084	407,117	13,033	3.31%
3550-Distribution Expenses - Maintenance	243,715	214,209	(29,506)	-12.11%
3650-Billing and Collecting	351,745	402,260	50,516	14.36%
3700-Community Relations	9,833	7,370	(2,463)	-25.05%
3800-Administrative and General Expenses	713,859	788,126	74,267	10.40%
LEAP	3,247	3,270	23	0.72%
Property Taxes	12,892	12,560	(331)	-2.57%
Total Eligible Distribution Expenses	1,729,373	1,834,912	**105,539**	**6.10%**
3350-Power Supply Expenses	11,109,584	11,362,446	252,862	2.28%
Total Expenses for Working Capital	12,838,957	13,197,358	358,401	2.79%
Working Capital factor	7.5%	7.5%	-	0.00%
Total Working Capital	**962,922**	**989,802**	**26,880**	**2.79%**

The total Rate Base in 2019 Actual of $10,144,879 is $81,026 or 0.81% greater than 2018 Actual. The main reasons for the variance are:

- The increase is mostly due to the difference between the closing asset balances for the two years. In 2019 there was the addition of a pickup truck for $38,401, IT spending of $85,869, plus regular asset replacement.
- Power Supply Expenses and OM&A increased to raise the working capital portion by $26,880.

2019 ACTUAL VS. 2020 BRIDGE:

Table 7 - 2019-2020 Rate Base Variances

	MIFRS	MIFRS		
Particulars	**2019**	**2020**	**Var**	**%**
Net Capital Assets in Service:				
Opening Net Assets	9,101,958	9,208,195	106,237	1.17%
Ending Net Assets	9,208,195	9,633,096	424,901	4.61%
Average Balance	9,155,077	9,420,646	265,569	2.90%
Working Capital Allowance	989,802	1,048,105	58,303	5.89%
Total Rate Base	**10,144,879**	**10,468,751**	**323,872**	3.19%
	MIFRS	**MIFRS**		
Expenses for Working Capital	**2019**	**2020**	**Var**	**%**
Eligible Distribution Expenses:				
3500-Distribution Expenses - Operation	407,117	430,429	23,312	5.73%
3550-Distribution Expenses - Maintenance	214,209	253,402	39,193	18.30%
3650-Billing and Collecting	402,260	417,717	15,457	3.84%
3700-Community Relations	7,370	5,458	(1,912)	-25.94%
3800-Administrative and General Expenses	788,126	790,494	2,368	0.30%
	3,270	3,303	33	1.00%
Property Taxes	12,560	14,000	1,440	11.46%
Total Eligible Distribution Expenses	1,834,912	1,914,803	**79,891**	**4.35%**
3350-Power Supply Expenses	11,362,446	12,059,931	697,485	6.14%
Total Expenses for Working Capital	13,197,358	13,974,734	777,376	5.89%
Working Capital factor	7.5%	7.5%	-	0.00%
Total Working Capital	**989,802**	**1,048,105**	**58,303**	**5.89%**

The total Rate Base in 2016 Actual of $1,715,138 is $41,075 or 2.45% greater than 2015 Actual. The main reasons for the variance are:

- The increase is mostly due to the difference between the closing asset balances for the two years. In 2020 a bucket truck will be added for a budgeted amount of $345,000, and IT spending of $140,000 is budgeted under System Renewal in the Distribution System Plan as well.
- Power Supply and OM&A Expense increases are projected to escalate the working capital portion by $58,303.

2020 BRIDGE VS. 2021 TEST YEAR:

Table 8 - 2020-2021 Rate Base Variances

	MIFRS	MIFRS		
Particulars	**2020**	**2021**	**Var**	**%**
Net Capital Assets in Service:				
Opening Net Assets	9,208,195	11,228,623	2,020,428	21.94%
Ending Net Assets	9,633,096	11,255,340	1,622,245	16.84%
Average Balance	9,420,646	11,241,982	1,821,336	19.33%
Working Capital Allowance	1,048,105	1,059,680	11,575	1.10%
Total Rate Base	**10,468,751**	**12,301,661**	**1,832,911**	17.51%
	MIFRS	**MIFRS**		
Expenses for Working Capital	**2020**	**2021**	**Var**	**%**
Eligible Distribution Expenses:				
3500-Distribution Expenses - Operation	430,429	443,000	12,571	2.92%
3550-Distribution Expenses - Maintenance	253,402	252,000	(1,402)	-0.55%
3650-Billing and Collecting	417,717	415,500	(2,217)	-0.53%
3700-Community Relations	5,458	7,500	2,042	0.00%
3800-Administrative and General Expenses	790,494	797,000	6,506	7.53%
	3,303	3,500	197	5.96%
Property Taxes	14,000	14,000	-	0.00%
Total Eligible Distribution Expenses	1,914,803	1,932,500	17,697	**0.92%**
3350-Power Supply Expenses	12,059,931	12,196,563	136,632	1.13%
Total Expenses for Working Capital	13,974,734	14,129,063	154,329	1.10%
Working Capital factor	7.5%	7.5%		0.00%
Total Working Capital	**1,048,105**	**1,059,680**	**11,575**	**1.10%**

The total planned Rate Base in 2021 Test Year is $12,301,661, $1,832,911 or 17.51% greater than the 2020 Bridge Year. The main reasons for the variance are:

- The inclusion of the $1,692,893 ACM regulatory assets into the Jan 1 asset values for rate base calculations. The MS3 substation rebuild was approved as part of WNPs 2016 COS and the ACM was approved in the 2018 IRM. The project was completed in 2018
- The level of yearly capital spending for 2021, in the amount of $627,000 is supported by the utility’s new Distribution System Plan. The budget takes into consideration the replacement of assets at a steady pace to avoid rate shock, and unexpected failure of these assets all while ensuring the proper functioning of WNPs distribution system. Details regarding capital planning can be found in the Distribution System Plan in Section 2.5.2 of this Exhibit.
- Power Supply and OM&A Expense increases are projected to escalate the working capital portion by $11,575.

2.1.4 FIXED ASSET CONTINUITY SCHEDULE

This Schedule presents a continuity schedule of its investment in capital assets, the associated accumulated amortization and the net book value for each Capital USoA account for the 2016 to 2019 Actuals and 2020 Bridge and 2021 Test Years.

WNP attests that the OEB Appendices 2-BA continuity statements presented at the next page reconcile with the calculated depreciation expenses, under Exhibit 4 – Operating Costs[3], and presented by asset account. The utility also attests that the net book value balances reported on Appendix 2-BA and balances reconcile with the rate base calculation. [4] [5] [6] The Excel version of the OEB Appendices is filed in conjunction with this application. [7] The utility notes that it applied for and received approval for an Advanced Capital Module (ACM) in its' 2016 Cost of Service application (EB-2015-0110) for the replacement of a substation in 2018. [8] Final allocation of the regulatory assets and termination of the ACM rate riders are discussed in section 2.5.7.

Information on year-over-year variance and explanation where variances are greater than the materiality threshold are summarized in the previous section 2.1.3 and explained in detail in WNP's 2020 Distribution System Plan.

WNP does not have any Asset Retirement Obligation related to decommissioning.[9]

Below are the Fixed Asset Continuity Schedules for 2016 to 2021.

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[3] MFR - Continuity statements must reconcile to calculated depreciation expenses and presented by asset account
[4] MFR - Opening and closing balances, average of opening and closing balances for gross assets and accumulated depreciation; working capital allowance (historical actuals, bridge and test year forecast)
[5] MFR - Continuity statements (year end balance, including interest during construction and overheads).
Explanation for any restatement (e.g. due to change in accounting standards)
Year over year variance analysis; explanation where variance greater than materiality threshold
Hist. OEB-Approved vs Hist. Actual
Hist. Act. vs. preceding Hist. Act.
Hist. Act. vs. Bridge
Bridge vs. Test
[6] MFR - Opening and closing balances of gross assets and accumulated depreciation must correspond to fixed asset continuity statements. If not, an explanation must be provided (e.g. WIP, ARO). Reconciliation must be between net book value balances reported on Appendix 2-BA and balances included in rate base calculation
[7] MFR - Completed Fixed Asset Continuity Schedule (Appendix 2-BA) - in Application and Excel format
[8] Summary of approved and actual costs for any ICM(s) and/ or ACM approved in previous IRM applications
[9] MFR - All asset disposals clearly identified in the Chapter 2 Appendices for all historical, bridge and test years and if any amounts related to gains or losses on disposals have been included in Account 1575 IFRS - CGAAP Transitional PP&E Amount

Table 9 – 2016 Continuity Schedule

CCA Class	OEB	Description	Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
	1609	Capital Contribution Paid		$ 838,765	$ -	$ 838,765	$ -	$ 16,775	$ -	$ 16,775	$ 821,990
12	1611	Computer Software (Formally known as Account 1925)	$ 223,612	$ 68,353	$ -	$ 291,965	$ 171,762	$ 23,901	$ -	$ 195,662	$ 96,303
CEC	1612	Land Rights (Formally known as Account 1906 and 1806)	$ 28,651	$ -	$ -	$ 28,651	$ -	$ -	$ -	$ -	$ 28,651
N/A	1805	Land	$ 41,988	$ -	$ -	$ 41,988	$ -	$ -	$ -	$ -	$ 41,988
47	1808	Buildings & Fixtures - MF Building	$ 212,482	$ -	$ -	$ 212,482	$ 7,967	$ 4,427	$ -	$ 12,394	$ 200,088
47	1808	Buildings & Fixtures - MF Fence/Parking/Roof	$ 38,932	$ -	$ -	$ 38,932	$ 3,645	$ 1,865	$ -	$ 5,509	$ 33,422
47	1808	Buildings & Fixtures - MF Fixture/Flooring	$ 52,585	$ -	$ -	$ 52,585	$ 4,929	$ 4,299	$ -	$ 9,228	$ 43,357
47	1808	Buildings & Fixtures - MF HVAC/Plumbing/Comm	$ 21,280	$ -	$ -	$ 21,280	$ 5,346	$ 1,756	$ -	$ 7,102	$ 14,178
47	1808	Buildings & Fixtures - AR Building	$ 3,421	$ -	$ -	$ 3,421	$ 115	$ 58	$ -	$ 173	$ 3,248
47	1808	Buildings & Fixtures - AR Fence/Parking/Roof	$ 10,882	$ -	$ -	$ 10,882	$ 1,036	$ 518	$ -	$ 1,555	$ 9,327
47	1808	Buildings & Fixtures - E.S. Shed Building	$ 32,500	$ -	$ -	$ 32,500	$ 1,232	$ 616	$ -	$ 1,848	$ 30,652
47	1808	Buildings & Fixtures - E.S. Shed Fixture/Flooring	$ 2,169	$ -	$ -	$ 2,169	$ 1,085	$ 542	$ -	$ 1,627	$ 542
47	1808	Buildings & Fixtures - E.S. Shed Fence/Parking/Roof	$ 1,067	$ -	$ -	$ 1,067	$ 142	$ 71	$ -	$ 213	$ 854
47	1808	Buildings & Fixtures - W.S. Shed	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1815	Transformer Station Equipment >50 kV	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1820	Sub Stations Power - Overall	$ 763,663	$ -	$ -	$ 763,663	$ 17,378	$ 18,296	$ -	$ 35,674	$ 727,988
47	1820	Sub Stations Power - Bushing	$ 10,876	$ 16,593	$ -	$ 27,469	$ 1,360	$ 1,095	$ -	$ 2,454	$ 25,015
47	1820	Sub Stations Power - Tap Changer	$ 32,006	$ -	$ -	$ 32,006	$ 5,144	$ 2,097	$ -	$ 7,241	$ 24,765
47	1820	Sub Stations Switchgear - Overall	$ 371,283	$ -	$ -	$ 371,283	$ 8,293	$ 11,015	$ -	$ 19,308	$ 351,975
47	1820	Sub Stations - Station Switch	$ 283,423	$ -	$ -	$ 283,423	$ 1,924	$ 6,080	$ -	$ 8,004	$ 275,419
47	1820	Sub Stations - Rigid Busbars	$ 17,731	$ -	$ -	$ 17,731	$ 845	$ 423	$ -	$ 1,268	$ 16,463
47	1820	Sub Stations - Steel Structure	$ 61,503	$ -	$ -	$ 61,503	$ 962	$ 1,386	$ -	$ 2,348	$ 59,155
47	1820	Sub Stations - Fence	$ 65,342	$ -	$ -	$ 65,342	$ 3,025	$ 3,230	$ -	$ 6,255	$ 59,087
47	1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1830	Poles Towers & Fixtures - Wood	$ 2,111,567	$ 226,512	-$ 2,791	$ 2,335,288	$ 99,461	$ 56,969	-$ 250	$ 156,180	$ 2,179,109
47	1830	Poles Towers & Fixtures - Concrete	$ 163,287	$ -	$ -	$ 163,287	$ 5,988	$ 2,994	$ -	$ 8,982	$ 154,305
47	1830	Poles Towers & Fixtures - Steel	$ 2,521	$ -	$ -	$ 2,521	$ 95	$ 48	$ -	$ 143	$ 2,379
47	1830	Poles Towers & Fixtures - Switches	$ 19,878	$ 22,041	$ -	$ 41,920	$ 638	$ 687	$ -	$ 1,324	$ 40,595
47	1835	O/H Conductors & Devices - Conductors	$ 594,879	$ 128,280	$ -	$ 723,159	$ 19,724	$ 12,304	$ -	$ 32,028	$ 691,131
47	1835	O/H Conductors & Devices - Line Switch	$ 4,658	$ -	$ -	$ 4,658	$ 209	$ 104	$ -	$ 313	$ 4,345
47	1835	O/H Conductors & Devices - Reclosers	$ 304,704	$ -	$ -	$ 304,704	$ -	$ 7,914	$ -	$ 7,914	$ 296,790
47	1840	U/G Conduit-Concret encased duct banks	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1840	U/G Conduit-Ducts	$ 861	$ -	$ -	$ 861	$ 36	$ 18	$ -	$ 53	$ 808
47	1840	U/G Conduit-UG Foundations	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1845	Underground Conductors & Devices	$ 531,821	$ -	$ -	$ 531,821	$ 24,690	$ 14,889	$ -	$ 39,579	$ 492,243
47	1850	Distribution Transformers - Overhead	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1850	Distribution Transformers - Inventory	$ 183,646	$ 681	$ -	$ 184,328	$ -	$ -	$ -	$ -	$ 184,328
47	1850	Distribution Transformers - UG Pad-Mounted Trans	$ 437,903	$ 2,912	$ -	$ 440,815	$ 30,640	$ 15,556	$ -	$ 46,195	$ 394,620
47	1850	Distribution Transformers - OH Trans & Voltage Reg	$ 476,516	$ 65,143	-$ 37	$ 541,622	$ 26,944	$ 15,739	-$ 7	$ 42,676	$ 498,946
47	1855	Distribution Services - UG Secondary in Duct	$ 160,247	$ 7,164	$ -	$ 167,410	$ 4,959	$ 2,932	$ -	$ 7,891	$ 159,519
47	1855	Distribution Services - OH Conductors	$ 137,212	$ 27,740	$ -	$ 164,952	$ 6,823	$ 4,228	$ -	$ 11,051	$ 153,901
47	1860	Distribution Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters - Inventory	$ 12,666	$ -	$ -	$ 12,666	$ 2,199	$ 1,100	$ -	$ 3,299	$ 9,367
47	1860	Distribution Meters - Residential Energy Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters - Ind/Com Energy Meters	$ 9,981	$ -	$ -	$ 9,981	$ 987	$ 494	$ -	$ 1,481	$ 8,500
47	1860	Distribution Meters - Wholesale Energy Meters	$ 71,393	$ 6,903	$ -	$ 78,296	$ 6,696	$ 3,463	$ -	$ 10,159	$ 68,137
47	1860	Distribution Meters - Current & Potential Meters	$ 1,884	$ 51,506	$ -	$ 53,390	$ 153	$ 1,107	$ -	$ 1,260	$ 52,130
47	1860	Distribution Meters-Smart	$ 453,089	$ 45,532	-$ 18,452	$ 480,169	$ 88,495	$ 46,562	-$ 4,210	$ 130,847	$ 349,322
47	1860	Distribution Meters-Smart-Repeaters	$ 240	$ -	$ -	$ 240	$ 240	$ -	$ -	$ 240	$ -
47	1860	Distribution Meters-Smart-Data Collectors	$ 19,055	$ 997	$ -	$ 20,053	$ 19,055	$ 100	$ -	$ 19,155	$ 897
47	1860	Distribution Meters-Stranded	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters-Inventory	$ 32,642	$ 1,867	$ -	$ 34,509	$ -	$ -	$ -	$ -	$ 34,509
N/A	1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (10 years)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (5 years)	$ 36,113	$ 482	$ -	$ 36,595	$ 14,353	$ 3,531	$ -	$ 17,884	$ 18,711
10	1920	Computer Equipment - Hardware	$ 240,562	$ 9,574	$ -	$ 250,136	$ 61,979	$ 43,546	$ -	$ 105,525	$ 144,611
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
45.1	1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
10	1930	Transportation Equipment - Trucks and Buckets	$ 383,965	$ -	$ -	$ 383,965	$ 152,956	$ 37,441	$ -	$ 190,397	$ 193,568
10	1930	Transportation Equipment - Trailers	$ 2,478	$ -	$ -	$ 2,478	$ 2,478	$ -	$ -	$ 2,478	$ -
10	1930	Transportation Equipment - Pick-ups/Vans/Cars	$ 26,668	$ -	$ -	$ 26,668	$ 10,673	$ 5,336	$ -	$ 16,009	$ 10,658
8	1935	Stores Equipment	$ 1,497	$ -	$ -	$ 1,497	$ 472	$ 236	$ -	$ 708	$ 789
8	1940	Tools, Shop & Garage Equipment	$ 8,616	$ 11,109	$ -	$ 19,726	$ 1,492	$ 1,478	$ -	$ 2,970	$ 16,756
8	1945	Measurement & Testing Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1955	Communications Equipment	$ 9,262	$ 13,391	$ -	$ 22,653	$ 6,933	$ 2,827	$ -	$ 9,759	$ 12,894
8	1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1960	Miscellaneous Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1980	System Supervisor Equipment	$ 274,688	$ -	$ -	$ 274,688	$ 37,401	$ 32,719	$ -	$ 70,121	$ 204,567
47	1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1995	Contributions & Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2440	Deferred Revenue	-$ 422,101	-$ 11,555	$ -	-$ 433,656	$ -	-$ 11,710	$ -	-$ 11,710	-$ 421,947
	2055	WIP	$ -	$ 12,461	$ -	$ 12,461	$ -	$ -	$ -	$ -	$ 12,461
		Sub-Total	**$ 8,567,794**	**$ 1,546,451**	**-$ 21,280**	**$ 10,092,965**	**$ 862,956**	**$ 401,061**	**-$ 4,467**	**$ 1,259,550**	**$ 8,833,414**

Table 10 – 2017 Continuity Schedule

CCA Class	OEB	Description	Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
	1609	Capital Contributions Paid	$ 838,765	$ -	$ -	$ 838,765	$ 16,775	$ 33,551	$ -	$ 50,326	$ 788,439
12	1611	Computer Software (Formally known as Account 1925)	$ 291,965	$ 30,801	$ -	$ 322,766	$ 195,662	$ 32,349	$ -	$ 228,011	$ 94,755
CEC	1612	Land Rights (Formally known as Account 1906 and 1806)	$ 28,651	$ -	$ -	$ 28,651	$ -	$ -	$ -	$ -	$ 28,651
N/A	1805	Land	$ 41,988	$ -	$ -	$ 41,988	$ -	$ -	$ -	$ -	$ 41,988
47	1808	Buildings & Fixtures - MF Building	$ 212,482	$ 3,350	$ -	$ 215,832	$ 12,394	$ 4,455	$ -	$ 16,849	$ 198,983
47	1808	Buildings & Fixtures - MF Fence/Parking/Roof	$ 38,932	$ 6,135	$ -	$ 45,067	$ 5,509	$ 1,987	$ -	$ 7,497	$ 37,570
47	1808	Buildings & Fixtures - MF Fixture/Flooring	$ 52,585		$ -	$ 52,585	$ 9,228	$ 4,299	$ -	$ 13,527	$ 39,058
47	1808	Buildings & Fixtures - MF HVAC/Plumbing/Comm	$ 21,280	$ 20,192	$ -	$ 41,472	$ 7,102	$ 2,429	$ -	$ 9,531	$ 31,941
47	1808	Buildings & Fixtures - AR Building	$ 3,421	$ -	$ -	$ 3,421	$ 173	$ 58	$ -	$ 231	$ 3,191
47	1808	Buildings & Fixtures - AR Fence/Parking/Roof	$ 10,882	$ -	$ -	$ 10,882	$ 1,555	$ 518	$ -	$ 2,073	$ 8,809
47	1808	Buildings & Fixtures - E.S. Shed Building	$ 32,500	$ -	$ -	$ 32,500	$ 1,848	$ 616	$ -	$ 2,463	$ 30,036
47	1808	Buildings & Fixtures - E.S. Shed Fixture/Flooring	$ 2,169	$ -	$ -	$ 2,169	$ 1,627	$ 542	$ -	$ 2,169	-$ 0
47	1808	Buildings & Fixtures - E.S. Shed Fence/Parking/Roof	$ 1,067	$ -	$ -	$ 1,067	$ 213	$ 71	$ -	$ 285	$ 783
47	1808	Buildings & Fixtures - W.S. Shed	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1815	Transformer Station Equipment >50 kV	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1820	Sub Stations Power - Overall	$ 763,663	$ 6,467	$ -	$ 770,130	$ 35,674	$ 18,368	$ -	$ 54,043	$ 716,087
47	1820	Sub Stations Power - Bushing	$ 27,469	$ -	$ -	$ 27,469	$ 2,454	$ 1,509	$ -	$ 3,964	$ 23,506
47	1820	Sub Stations Power - Tap Changer	$ 32,006	$ -	$ -	$ 32,006	$ 7,241	$ 2,097	$ -	$ 9,337	$ 22,668
47	1820	Sub Stations Switchgear - Overall	$ 371,283	$ -	$ -	$ 371,283	$ 19,308	$ 11,015	$ -	$ 30,323	$ 340,960
47	1820	Sub Stations - Station Switch	$ 283,423	$ -	$ -	$ 283,423	$ 8,004	$ 6,080	$ -	$ 14,084	$ 269,339
47	1820	Sub Stations - Rigid Busbars	$ 17,731	$ -	$ -	$ 17,731	$ 1,268	$ 423	$ -	$ 1,691	$ 16,041
47	1820	Sub Stations - Steel Structure	$ 61,503	$ -	$ -	$ 61,503	$ 2,348	$ 1,386	$ -	$ 3,734	$ 57,769
47	1820	Sub Stations - Fence	$ 65,342	$ -	$ -	$ 65,342	$ 6,255	$ 2,732	$ -	$ 8,988	$ 56,355
47	1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1830	Poles Towers & Fixtures - Wood	$ 2,335,288	$ 174,042	-$ 3,493	$ 2,505,837	$ 156,180	$ 61,315	-$ 575	$ 216,919	$ 2,288,918
47	1830	Poles Towers & Fixtures - Concrete	$ 163,287		-$ 3,720	$ 159,567	$ 8,982	$ 2,994	$ -	$ 11,975	$ 147,591
47	1830	Poles Towers & Fixtures - Steel	$ 2,521		$ -	$ 2,521	$ 143	$ 48	$ -	$ 190	$ 2,331
47	1830	Poles Towers & Fixtures - Switches	$ 41,920		$ -	$ 41,920	$ 1,324	$ 932	$ -	$ 2,256	$ 39,664
47	1835	O/H Conductors & Devices - Conductors	$ 723,159	$ 82,813	$ -	$ 805,972	$ 32,028	$ 14,098	$ -	$ 46,126	$ 759,846
47	1835	O/H Conductors & Devices - Line Switch	$ 4,658	$ -	$ -	$ 4,658	$ 313	$ 104	$ -	$ 418	$ 4,240
47	1835	O/H Conductors & Devices - Reclosers	$ 304,704	$ -	$ -	$ 304,704	$ 7,914	$ 7,914	$ -	$ 15,829	$ 288,875
47	1840	U/G Conduit-Concret encased duct banks	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1840	U/G Conduit-Ducts	$ 861	$ -	$ -	$ 861	$ 53	$ 18	$ -	$ 71	$ 790
47	1840	U/G Conduit-UG Foundations	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1845	Underground Conductors & Devices	$ 531,821	$ 2,765	$ -	$ 534,586	$ 39,579	$ 14,924	$ -	$ 54,503	$ 480,084
47	1850	Distribution Transformers - Overhead	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1850	Distribution Transformers - Inventory	$ 184,328	-$ 15,929	$ -	$ 168,399	$ -	$ -	$ -	$ -	$ 168,399
47	1850	Distribution Transformers - UG Pad-Mounted Trans	$ 440,815	$ 5,877	$ -	$ 446,692	$ 46,195	$ 15,643	$ -	$ 61,839	$ 384,854
47	1850	Distribution Transformers - OH Trans & Voltage Reg	$ 541,622	$ 58,291	$ -	$ 599,913	$ 42,676	$ 17,280	$ -	$ 59,956	$ 539,956
47	1855	Distribution Services - UG Secondary in Duct	$ 167,410	$ 14,767	$ -	$ 182,177	$ 7,891	$ 3,118	$ -	$ 11,009	$ 171,168
47	1855	Distribution Services - OH Conductors	$ 164,952	$ 27,056	-$ 927	$ 191,080	$ 11,051	$ 4,800	$ -	$ 15,851	$ 175,229
47	1860	Distribution Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters - Inventory	$ 12,666	$ -	$ -	$ 12,666	$ 3,299	$ 1,100	$ -	$ 4,398	$ 8,268
47	1860	Distribution Meters - Residential Energy Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters - Ind/Com Energy Meters	$ 9,981	$ -	$ -	$ 9,981	$ 1,481	$ 494		$ 1,974	$ 8,006
47	1860	Distribution Meters - Wholesale Energy Meters	$ 78,296	$ -	$ -	$ 78,296	$ 10,159	$ 3,578		$ 13,738	$ 64,559
47	1860	Distribution Meters - Current & Potential Meters	$ 53,390	$ -	$ -	$ 53,390	$ 1,260	$ 2,137		$ 3,397	$ 49,993
47	1860	Distribution Meters-Smart	$ 480,169	$ 57,413	-$ 13,484	$ 524,098	$ 130,847	$ 48,608	-$ 4,478	$ 174,977	$ 349,122
47	1860	Distribution Meters-Smart-Repeaters	$ 240	$ -	$ -	$ 240	$ 240	$ -		$ 240	$ -
47	1860	Distribution Meters-Smart-Data Collectors	$ 20,053	$ -	$ -	$ 20,053	$ 19,155	$ 199		$ 19,355	$ 698
47	1860	Distribution Meters-Stranded	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters-Inventory	$ 34,509	$ 46,710	$ -	$ 81,219	$ -	$ -	$ -	$ -	$ 81,219
N/A	1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (10 years)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (5 years)	$ 36,595	$ 21,824	-$ 4,194	$ 54,225	$ 17,884	$ 4,559	-$ 4,194	$ 18,250	$ 35,975
10	1920	Computer Equipment - Hardware	$ 250,136	$ 18,774	-$ 3,162	$ 265,748	$ 105,525	$ 46,717	-$ 2,341	$ 149,901	$ 115,847
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
45.1	1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
10	1930	Transportation Equipment - Trucks and Buckets	$ 383,965	$ -	$ -	$ 383,965	$ 190,397	$ 36,034	$ -	$ 226,431	$ 157,533
10	1930	Transportation Equipment - Trailers	$ 2,478	$ -	$ -	$ 2,478	$ 2,478	$ -	$ -	$ 2,478	$ -
10	1930	Transportation Equipment - Pick-ups/Vans/Cars	$ 26,668	$ 37,499	$ -	$ 64,167	$ 16,009	$ 9,086	$ -	$ 25,096	$ 39,071
8	1935	Stores Equipment	$ 1,497	$ -	$ -	$ 1,497	$ 708	$ 236	$ -	$ 944	$ 553
8	1940	Tools, Shop & Garage Equipment	$ 19,726	$ -	$ -	$ 19,726	$ 2,970	$ 2,034	$ -	$ 5,004	$ 14,722
8	1945	Measurement & Testing Equipment	$ -	$ 24,683	$ -	$ 24,683	$ -	$ 1,234	$ -	$ 1,234	$ 23,449
8	1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1955	Communications Equipment	$ 22,653	$ 591	$ -	$ 23,244	$ 9,759	$ 3,302	$ -	$ 13,061	$ 10,184
8	1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1960	Miscellaneous Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1980	System Supervisor Equipment	$ 274,688	$ 1,113	$ -	$ 275,801	$ 70,121	$ 32,775	$ -	$ 102,896	$ 172,905
47	1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1995	Contributions & Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2440	Deferred Revenue	-$ 433,656	$ -	$ -	-$ 433,656	-$ 11,710	-$ 11,854	$ -	-$ 23,564	-$ 410,093
	2055	WIP	$ 12,461	$ 106,558	$ -	$ 119,019	$ -	$ -	$ -	$ -	$ 119,019
		Sub-Total	**$ 10,092,965**	**$ 731,792**	**-$ 28,980**	**$ 10,795,777**	**$ 1,259,550**	**$ 447,912**	**-$ 11,588**	**$ 1,695,875**	**$ 9,099,903**

Table 11 – 2018 Continuity Schedule

			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	$ 838,765	$ -	$ -	$ 838,765	$ 50,326	$ 33,551	$ -	$ 83,877	$ 754,889
12	1611	Computer Software (Formally known as Account 1925)	$ 322,766	$ 4,700	$ -	$ 327,466	$ 228,011	$ 31,663	$ -	$ 259,674	$ 67,792
CEC	1612	Land Rights (Formally known as Account 1906 and 1806)	$ 28,651	$ -	$ -	$ 28,651	$ -	$ -	$ -	$ -	$ 28,651
N/A	1805	Land	$ 41,988	$ -	$ -	$ 41,988	$ -	$ -	$ -	$ -	$ 41,988
47	1808	Buildings & Fixtures - MF Building	$ 215,832	$ -	$ -	$ 215,832	$ 16,849	$ 4,483	$ -	$ 21,332	$ 194,500
47	1808	Buildings & Fixtures - MF Fence/Parking/Roof	$ 45,067	$ -	$ -	$ 45,067	$ 7,497	$ 2,110	$ -	$ 9,607	$ 35,460
47	1808	Buildings & Fixtures - MF Fixture/Flooring	$ 52,585	$ -	$ -	$ 52,585	$ 13,527	$ 4,299	$ -	$ 17,827	$ 34,759
47	1808	Buildings & Fixtures - MF HVAC/Plumbing/Comm	$ 41,472	$ -	$ -	$ 41,472	$ 9,531	$ 3,102	$ -	$ 12,633	$ 28,839
47	1808	Buildings & Fixtures - AR Building	$ 3,421	$ -	$ -	$ 3,421	$ 231	$ 58	$ -	$ 288	$ 3,133
47	1808	Buildings & Fixtures - AR Fence/Parking/Roof	$ 10,882	$ -	$ -	$ 10,882	$ 2,073	$ 518	$ -	$ 2,591	$ 8,291
47	1808	Buildings & Fixtures - E.S. Shed Building	$ 32,500	$ -	$ -	$ 32,500	$ 2,463	$ 616	$ -	$ 3,079	$ 29,421
47	1808	Buildings & Fixtures - E.S. Shed Fixture/Flooring	$ 2,169	$ -	$ -	$ 2,169	$ 2,169	$ -	$ -	$ 2,169	-$ 0
47	1808	Buildings & Fixtures - E.S. Shed Fence/Parking/Roof	$ 1,067	$ -	$ -	$ 1,067	$ 285	$ 71	$ -	$ 356	$ 711
47	1808	Buildings & Fixtures - W.S. Shed	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1815	Transformer Station Equipment >50 kV	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1820	Sub Stations Power - Overall	$ 770,130	$ -	$ -	$ 770,130	$ 54,043	$ 18,440	$ -	$ 72,483	$ 697,647
47	1820	Sub Stations Power - Bushing	$ 27,469	$ -	$ -	$ 27,469	$ 3,964	$ 1,509	$ -	$ 5,473	$ 21,996
47	1820	Sub Stations Power - Tap Changer	$ 32,006	$ -	$ -	$ 32,006	$ 9,337	$ 2,097	$ -	$ 11,434	$ 20,572
47	1820	Sub Stations Switchgear - Overall	$ 371,283	$ -	$ -	$ 371,283	$ 30,323	$ 11,015	$ -	$ 41,338	$ 329,945
47	1820	Sub Stations - Station Switch	$ 283,423	$ -	$ -	$ 283,423	$ 14,084	$ 6,080	$ -	$ 20,163	$ 263,260
47	1820	Sub Stations - Rigid Busbars	$ 17,731	$ -	$ -	$ 17,731	$ 1,691	$ 423	$ -	$ 2,113	$ 15,618
47	1820	Sub Stations - Steel Structure	$ 61,503	$ -	$ -	$ 61,503	$ 3,734	$ 1,386	$ -	$ 5,120	$ 56,383
47	1820	Sub Stations - Fence	$ 65,342	$ -	$ -	$ 65,342	$ 8,988	$ 2,732	$ -	$ 11,720	$ 53,622
47	1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1830	Poles Towers & Fixtures - Wood	$ 2,505,837	$ 134,444	-$ 5,225	$ 2,635,055	$ 216,919	$ 64,447	-$ 780	$ 280,586	$ 2,354,469
47	1830	Poles Towers & Fixtures - Concrete	$ 159,567	$ -	$ -	$ 159,567	$ 11,975	$ 2,994	$ -	$ 14,969	$ 144,597
47	1830	Poles Towers & Fixtures - Steel	$ 2,521	$ -	$ -	$ 2,521	$ 190	$ 48	$ -	$ 238	$ 2,284
47	1830	Poles Towers & Fixtures - Switches	$ 41,920	$ -	$ -	$ 41,920	$ 2,256	$ 932	$ -	$ 3,187	$ 38,732
47	1835	O/H Conductors & Devices - Conductors	$ 805,972	$ 20,459	$ -	$ 826,431	$ 46,126	$ 14,980	$ -	$ 61,106	$ 765,325
47	1835	O/H Conductors & Devices - Line Switch	$ 4,658	$ 26,993	$ -	$ 31,651	$ 418	$ 404	$ -	$ 822	$ 30,829
47	1835	O/H Conductors & Devices - Reclosers	$ 304,704	$ -	$ -	$ 304,704	$ 15,829	$ 7,914	$ -	$ 23,743	$ 280,961
47	1840	U/G Conduit-Concret encased duct banks	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1840	U/G Conduit-Ducts	$ 861	$ -	$ -	$ 861	$ 71	$ 18	$ -	$ 89	$ 772
47	1840	U/G Conduit-UG Foundations	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1845	Underground Conductors & Devices	$ 534,586	$ 43,039	$ -	$ 577,626	$ 54,503	$ 15,496	$ -	$ 69,999	$ 507,627
47	1850	Distribution Transformers - Overhead	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1850	Distribution Transformers - Inventory	$ 168,399	-$ 35,747	$ -	$ 132,652	$ -	$ -	$ -	$ -	$ 132,652
47	1850	Distribution Transformers - UG Pad-Mounted Trans	$ 446,692	$ 75,654	$ -	$ 522,347	$ 61,839	$ 16,663	$ -	$ 78,501	$ 443,845
47	1850	Distribution Transformers - OH Trans & Voltage Reg	$ 599,913	$ 58,273	-$ 11,742	$ 646,443	$ 59,956	$ 18,822	-$ 1,542	$ 77,236	$ 569,207
47	1855	Distribution Services - UG Secondary in Duct	$ 182,177	$ 25,475	$ -	$ 207,652	$ 11,009	$ 3,457	$ -	$ 14,466	$ 193,186
47	1855	Distribution Services - OH Conductors	$ 191,080	$ 31,735	$ -	$ 222,815	$ 15,851	$ 5,594	$ -	$ 21,444	$ 201,371
47	1860	Distribution Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters - Inventory	$ 12,666	$ -	$ -	$ 12,666	$ 4,398	$ 1,100	$ -	$ 5,498	$ 7,168
47	1860	Distribution Meters - Residential Energy Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters - Ind/Com Energy Meters	$ 9,981	$ -	-$ 2,133	$ 7,848	$ 1,974	$ 409	-$ 477	$ 1,907	$ 5,941
47	1860	Distribution Meters - Wholesale Energy Meters	$ 78,296	$ -	$ -	$ 78,296	$ 13,738	$ 3,578	$ -	$ 17,316	$ 60,980
47	1860	Distribution Meters - Current & Potential Meters	$ 53,390	$ -	$ -	$ 53,390	$ 3,397	$ 2,137	$ -	$ 5,534	$ 47,856
47	1860	Distribution Meters-Smart	$ 524,098	$ 187,345	-$ 32,728	$ 678,715	$ 174,977	$ 54,584	-$ 18,203	$ 211,358	$ 467,356
47	1860	Distribution Meters-Smart-Repeaters	$ 240	$ -	$ -	$ 240	$ 240	$ -	$ -	$ 240	$ -
47	1860	Distribution Meters-Smart-Data Collectors	$ 20,053	$ -	$ -	$ 20,053	$ 19,355	$ 199	$ -	$ 19,554	$ 499
47	1860	Distribution Meters-Stranded	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters-Inventory	$ 81,219	$ 23,211	$ -	$ 104,430	$ -	$ -	$ -	$ -	$ 104,430
N/A	1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (10 years)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (5 years)	$ 54,225	$ -	$ -	$ 54,225	$ 18,250	$ 5,560	$ -	$ 23,810	$ 30,415
10	1920	Computer Equipment - Hardware	$ 265,748	$ 21,639	$ -	$ 287,387	$ 149,901	$ 48,429	$ -	$ 198,330	$ 89,057
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
45.1	1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
10	1930	Transportation Equipment - Trucks and Buckets	$ 383,965	$ -	$ -	$ 383,965	$ 226,431	$ 34,628	$ -	$ 261,060	$ 122,905
10	1930	Transportation Equipment - Trailers	$ 2,478	$ -	$ -	$ 2,478	$ 2,478	$ -	$ -	$ 2,478	$ -
10	1930	Transportation Equipment - Pick-ups/Vans/Cars	$ 64,167	$ -	$ -	$ 64,167	$ 25,096	$ 12,822	$ -	$ 37,918	$ 26,249
8	1935	Stores Equipment	$ 1,497	$ -	$ -	$ 1,497	$ 944	$ 236	$ -	$ 1,180	$ 317
8	1940	Tools, Shop & Garage Equipment	$ 19,726	$ 2,144	$ -	$ 21,870	$ 5,004	$ 2,086	$ -	$ 7,090	$ 14,780
8	1945	Measurement & Testing Equipment	$ 24,683	$ -	$ -	$ 24,683	$ 1,234	$ 2,468	$ -	$ 3,702	$ 20,980
8	1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1955	Communications Equipment	$ 23,244	$ -	$ -	$ 23,244	$ 13,061	$ 3,074	$ -	$ 16,135	$ 7,110
8	1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1960	Miscellaneous Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1980	System Supervisor Equipment	$ 275,801	$ -	$ -	$ 275,801	$ 102,896	$ 32,831	$ -	$ 135,726	$ 140,074
47	1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1995	Contributions & Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2440	Deferred Revenue	-$ 433,656	$ -	$ -	-$ 433,656	-$ 23,564	-$ 11,854	$ -	-$ 35,418	-$ 398,239
	2055	WIP	$ 119,019	-$ 118,272	$ -	$ 747		$ -	$ -	$ -	$ 747
		Sub-Total	**$ 10,795,777**	**$ 501,091**	**-$ 51,829**	**$ 11,245,040**	**$ 1,695,875**	**$ 468,209**	**-$ 21,002**	**$ 2,143,082**	**$ 9,101,958**

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Table 12 – 2019 Continuity Schedule

			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	$ 838,765	$ -	$ -	$ 838,765	$ 83,877	$ 33,551	$ -	$ 117,427	$ 721,338
12	1611	Computer Software (Formally known as Account 1925)	$ 327,466	$ 32,207	-$ 44,738	$ 314,935	$ 259,674	$ 29,552	-$ 44,738	$ 244,488	$ 70,447
CEC	1612	Land Rights (Formally known as Account 1906 and 1806)	$ 28,651	$ -	$ -	$ 28,651	$ -	$ -	$ -	$ -	$ 28,651
N/A	1805	Land	$ 41,988	$ -	$ -	$ 41,988	$ -	$ -	$ -	$ -	$ 41,988
47	1808	Buildings & Fixtures - MF Building	$ 215,832	$ 1,215	$ -	$ 217,047	$ 21,332	$ 4,493	$ -	$ 25,826	$ 191,221
47	1808	Buildings & Fixtures - MF Fence/Parking/Roof	$ 45,067	$ -	$ -	$ 45,067	$ 9,607	$ 2,110	$ -	$ 11,717	$ 33,350
47	1808	Buildings & Fixtures - MF Fixture/Flooring	$ 52,585	$ -	$ -	$ 52,585	$ 17,827	$ 4,299	$ -	$ 22,126	$ 30,459
47	1808	Buildings & Fixtures - MF HVAC/Plumbing/Comm	$ 41,472	$ -	$ -	$ 41,472	$ 12,633	$ 3,102	$ -	$ 15,735	$ 25,737
47	1808	Buildings & Fixtures - AR Building	$ 3,421	$ -	$ -	$ 3,421	$ 288	$ 58	$ -	$ 346	$ 3,075
47	1808	Buildings & Fixtures - AR Fence/Parking/Roof	$ 10,882	$ -	$ -	$ 10,882	$ 2,591	$ 518	$ -	$ 3,109	$ 7,773
47	1808	Buildings & Fixtures - E.S. Shed Building	$ 32,500	$ -	$ -	$ 32,500	$ 3,079	$ 616	$ -	$ 3,695	$ 28,805
47	1808	Buildings & Fixtures - E.S. Shed Fixture/Flooring	$ 2,169	$ -	$ -	$ 2,169	$ 2,169	$ -	$ -	$ 2,169	-$ 0
47	1808	Buildings & Fixtures - E.S. Shed Fence/Parking/Roof	$ 1,067	$ -	$ -	$ 1,067	$ 356	$ 71	$ -	$ 427	$ 640
47	1808	Buildings & Fixtures - W.S. Shed	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1815	Transformer Station Equipment >50 kV	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1820	Sub Stations Power - Overall	$ 770,130	$ -	$ -	$ 770,130	$ 72,483	$ 18,440	$ -	$ 90,922	$ 679,207
47	1820	Sub Stations Power - Bushing	$ 27,469	$ -	$ -	$ 27,469	$ 5,473	$ 1,509	$ -	$ 6,982	$ 20,487
47	1820	Sub Stations Power - Tap Changer	$ 32,006	$ -	$ -	$ 32,006	$ 11,434	$ 2,097	$ -	$ 13,531	$ 18,475
47	1820	Sub Stations Switchgear - Overall	$ 371,283	$ -	$ -	$ 371,283	$ 41,338	$ 11,015	$ -	$ 52,353	$ 318,930
47	1820	Sub Stations - Station Switch	$ 283,423	$ -	$ -	$ 283,423	$ 20,163	$ 6,080	$ -	$ 26,243	$ 257,180
47	1820	Sub Stations - Rigid Busbars	$ 17,731	$ -	$ -	$ 17,731	$ 2,113	$ 423	$ -	$ 2,536	$ 15,195
47	1820	Sub Stations - Steel Structure	$ 61,503	$ -	$ -	$ 61,503	$ 5,120	$ 1,386	$ -	$ 6,506	$ 54,997
47	1820	Sub Stations - Fence	$ 65,342	$ 3,323	$ -	$ 68,665	$ 11,720	$ 2,799	$ -	$ 14,519	$ 54,146
47	1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1830	Poles Towers & Fixtures - Wood	$ 2,635,055	$ 171,616	-$ 5,841	$ 2,800,830	$ 280,586	$ 67,550	-$ 667	$ 347,469	$ 2,453,361
47	1830	Poles Towers & Fixtures - Concrete	$ 159,567	$ -	$ -	$ 159,567	$ 14,969	$ 2,994	$ -	$ 17,963	$ 141,604
47	1830	Poles Towers & Fixtures - Steel	$ 2,521	$ -	$ -	$ 2,521	$ 238	$ 48	$ -	$ 285	$ 2,236
47	1830	Poles Towers & Fixtures - Switches	$ 41,920	$ -	$ -	$ 41,920	$ 3,187	$ 932	$ -	$ 4,119	$ 37,801
47	1835	O/H Conductors & Devices - Conductors	$ 826,431	$ 87,280	$ -	$ 913,712	$ 61,106	$ 15,889	$ -	$ 76,995	$ 836,716
47	1835	O/H Conductors & Devices - Line Switch	$ 31,651	$ -	$ -	$ 31,651	$ 822	$ 704	$ -	$ 1,526	$ 30,125
47	1835	O/H Conductors & Devices - Reclosers	$ 304,704	$ -	$ -	$ 304,704	$ 23,743	$ 7,914	$ -	$ 31,658	$ 273,047
47	1840	U/G Conduit-Concret encased duct banks	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1840	U/G Conduit-Ducts	$ 861	$ -	$ -	$ 861	$ 89	$ 18	$ -	$ 107	$ 754
47	1840	U/G Conduit-UG Foundations	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1845	Underground Conductors & Devices	$ 577,626	$ 1,582	$ -	$ 579,208	$ 69,999	$ 16,054	$ -	$ 86,053	$ 493,155
47	1850	Distribution Transformers - Overhead	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1850	Distribution Transformers - Inventory	$ 132,652	$ 14,321	$ -	$ 146,973	$ -	$ -	$ -	$ -	$ 146,973
47	1850	Distribution Transformers - UG Pad-Mounted Trans	$ 522,347	$ 20,511	-$ 19,690	$ 523,168	$ 78,501	$ 17,843	-$ 3,099	$ 93,245	$ 429,923
47	1850	Distribution Transformers - OH Trans & Voltage Reg	$ 646,443	$ 43,845	-$ 2,333	$ 687,955	$ 77,236	$ 19,894	-$ 406	$ 96,724	$ 591,231
47	1855	Distribution Services - UG Secondary in Duct	$ 207,652	$ 9,724	$ -	$ 217,376	$ 14,466	$ 3,750	$ -	$ 18,216	$ 199,160
47	1855	Distribution Services - OH Conductors	$ 222,815	$ 11,026	$ -	$ 233,841	$ 21,444	$ 6,133	$ -	$ 27,577	$ 206,264
47	1860	Distribution Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters - Inventory	$ 12,666	$ -	$ -	$ 12,666	$ 5,498	$ 1,100	$ -	$ 6,597	$ 6,068
47	1860	Distribution Meters - Residential Energy Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters - Ind/Com Energy Meters	$ 7,848	$ -	$ -	$ 7,848	$ 1,907	$ 381	$ -	$ 2,288	$ 5,560
47	1860	Distribution Meters - Wholesale Energy Meters	$ 78,296	$ 13,317	$ -	$ 91,614	$ 17,316	$ 3,800	$ -	$ 21,116	$ 70,498
47	1860	Distribution Meters - Current & Potential Meters	$ 53,390	$ -	$ -	$ 53,390	$ 5,534	$ 2,137	$ -	$ 7,671	$ 45,719
47	1860	Distribution Meters-Smart	$ 678,715	$ 154,346	-$ 47,164	$ 785,897	$ 211,358	$ 61,108	-$ 18,982	$ 253,485	$ 532,412
47	1860	Distribution Meters-Smart-Repeaters	$ 240	$ -	$ -	$ 240	$ 240	$ -	$ -	$ 240	$ -
47	1860	Distribution Meters-Smart-Data Collectors	$ 20,053	$ -	$ -	$ 20,053	$ 19,554	$ 199	$ -	$ 19,753	$ 299
47	1860	Distribution Meters-Stranded	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters-Inventory	$ 104,430	-$ 25,195	$ -	$ 79,235	$ -	$ -	$ -	$ -	$ 79,235
N/A	1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (10 years)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (5 years)	$ 54,225	$ 14,011		$ 68,236	$ 23,810	$ 6,175	$ -	$ 29,985	$ 38,251
10	1920	Computer Equipment - Hardware	$ 287,387	$ 53,662	-$ 19,216	$ 321,833	$ 198,330	$ 51,239	-$ 19,216	$ 230,353	$ 91,480
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
45.1	1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
10	1930	Transportation Equipment - Trucks and Buckets	$ 383,965	$ -	$ -	$ 383,965	$ 261,060	$ 32,289	$ -	$ 293,348	$ 90,617
10	1930	Transportation Equipment - Trailers	$ 2,478	$ -	$ -	$ 2,478	$ 2,478	$ -	$ -	$ 2,478	$ -
10	1930	Transportation Equipment - Pick-ups/Vans/Cars	$ 64,167	$ 38,401	$ -	$ 102,568	$ 37,918	$ 11,340	$ -	$ 49,258	$ 53,311
8	1935	Stores Equipment	$ 1,497	$ -	$ -	$ 1,497	$ 1,180	$ 236	$ -	$ 1,416	$ 81
8	1940	Tools, Shop & Garage Equipment	$ 21,870	$ 3,795	$ -	$ 25,665	$ 7,090	$ 2,329	$ -	$ 9,419	$ 16,246
8	1945	Measurement & Testing Equipment	$ 24,683	$ -	$ -	$ 24,683	$ 3,702	$ 2,468	$ -	$ 6,171	$ 18,512
8	1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1955	Communications Equipment	$ 23,244	$ -	$ -	$ 23,244	$ 16,135	$ 2,797	$ -	$ 18,931	$ 4,313
8	1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1960	Miscellaneous Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1980	System Supervisor Equipment	$ 275,801	$ 7,835	$ -	$ 283,636	$ 135,726	$ 33,222	$ -	$ 168,949	$ 114,688
47	1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1995	Contributions & Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2440	Deferred Revenue	-$ 433,656	-$ 25,840	$ -	-$ 459,496	-$ 35,418	-$ 12,503	$ -	-$ 47,921	-$ 411,575
	2055	WIP	$ 747	$ 7,286	$ -	$ 8,033	$ -	$ -	$ -	$ -	$ 8,033
		Sub-Total	$ 11,245,040	**$ 638,269**	**-$ 138,982**	**$ 11,744,327**	**$ 2,143,082**	**$ 480,159**	**-$ 87,108**	**$ 2,536,132**	**$ 9,208,195**

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Table 13 – Bridge Year 2020 Continuity Schedule

			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	$ 838,765	$ -	$ -	$ 838,765	$ 117,427	$ 33,551	$ -	$ 150,978	$ 687,787
12	1611	Computer Software (Formally known as Account 1925)	$ 314,935	$ 60,000	$ -	$ 374,935	$ 244,488	$ 35,477	$ -	$ 279,964	$ 94,970
CEC	1612	Land Rights (Formally known as Account 1906 and 1806)	$ 28,651	$ -	$ -	$ 28,651	$ -	$ -	$ -	$ -	$ 28,651
N/A	1805	Land	$ 41,988	$ -	$ -	$ 41,988	$ -	$ -	$ -	$ -	$ 41,988
47	1808	Buildings & Fixtures - MF Building	$ 217,047	$ -	$ -	$ 217,047	$ 25,826	$ 4,503	$ -	$ 30,329	$ 186,718
47	1808	Buildings & Fixtures - MF Fence/Parking/Roof	$ 45,067	$ -	$ -	$ 45,067	$ 11,717	$ 2,110	$ -	$ 13,827	$ 31,239
47	1808	Buildings & Fixtures - MF Fixture/Flooring	$ 52,585	$ 15,000	$ -	$ 67,585	$ 22,126	$ 4,799	$ -	$ 26,925	$ 40,660
47	1808	Buildings & Fixtures - MF HVAC/Plumbing/Comm	$ 41,472	$ 30,000	$ -	$ 71,472	$ 15,735	$ 4,102	$ -	$ 19,837	$ 51,635
47	1808	Buildings & Fixtures - AR Building	$ 3,421	$ -	$ -	$ 3,421	$ 346	$ 58	$ -	$ 404	$ 3,018
47	1808	Buildings & Fixtures - AR Fence/Parking/Roof	$ 10,882	$ -	$ -	$ 10,882	$ 3,109	$ 518	$ -	$ 3,627	$ 7,255
47	1808	Buildings & Fixtures - E.S. Shed Building	$ 32,500	$ -	$ -	$ 32,500	$ 3,695	$ 616	$ -	$ 4,311	$ 28,189
47	1808	Buildings & Fixtures - E.S. Shed Fixture/Flooring	$ 2,169	$ -	$ -	$ 2,169	$ 2,169	$ -	$ -	$ 2,169	-$ 0
47	1808	Buildings & Fixtures - E.S. Shed Fence/Parking/Roof	$ 1,067	$ -	$ -	$ 1,067	$ 427	$ 71	$ -	$ 498	$ 569
47	1808	Buildings & Fixtures - W.S. Shed	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1815	Transformer Station Equipment >50 kV	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1820	Sub Stations Power - Overall	$ 770,130	$ -	$ -	$ 770,130	$ 90,922	$ 18,440	$ -	$ 109,362	$ 660,767
47	1820	Sub Stations Power - Bushing	$ 27,469	$ -	$ -	$ 27,469	$ 6,982	$ 1,509	$ -	$ 8,492	$ 18,977
47	1820	Sub Stations Power - Tap Changer	$ 32,006	$ -	$ -	$ 32,006	$ 13,531	$ 2,097	$ -	$ 15,628	$ 16,378
47	1820	Sub Stations Switchgear - Overall	$ 371,283	$ -	$ -	$ 371,283	$ 52,353	$ 11,015	$ -	$ 63,368	$ 307,915
47	1820	Sub Stations - Station Switch	$ 283,423	$ -	$ -	$ 283,423	$ 26,243	$ 6,080	$ -	$ 32,322	$ 251,100
47	1820	Sub Stations - Rigid Busbars	$ 17,731	$ -	$ -	$ 17,731	$ 2,536	$ 423	$ -	$ 2,959	$ 14,772
47	1820	Sub Stations - Steel Structure	$ 61,503	$ -	$ -	$ 61,503	$ 6,506	$ 1,386	$ -	$ 7,892	$ 53,611
47	1820	Sub Stations - Fence	$ 68,665	$ -	$ -	$ 68,665	$ 14,519	$ 2,865	$ -	$ 17,385	$ 51,281
47	1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1830	Poles Towers & Fixtures - Wood	$ 2,800,830	$ 165,000	$ -	$ 2,965,830	$ 347,469	$ 71,275	$ -	$ 418,744	$ 2,547,086
47	1830	Poles Towers & Fixtures - Concrete	$ 159,567	$ -	$ -	$ 159,567	$ 17,963	$ 2,994	$ -	$ 20,957	$ 138,610
47	1830	Poles Towers & Fixtures - Steel	$ 2,521	$ -	$ -	$ 2,521	$ 285	$ 48	$ -	$ 333	$ 2,188
47	1830	Poles Towers & Fixtures - Switches	$ 41,920	$ -	$ -	$ 41,920	$ 4,119	$ 932	$ -	$ 5,050	$ 36,869
47	1835	O/H Conductors & Devices - Conductors	$ 913,712	$ 85,000	$ -	$ 998,712	$ 76,995	$ 17,461	$ -	$ 94,456	$ 904,255
47	1835	O/H Conductors & Devices - Line Switch	$ 31,651	$ -	$ -	$ 31,651	$ 1,526	$ 704	$ -	$ 2,231	$ 29,420
47	1835	O/H Conductors & Devices - Reclosers	$ 304,704	$ -	$ -	$ 304,704	$ 31,658	$ 7,914	$ -	$ 39,572	$ 265,132
47	1840	U/G Conduit-Concret encased duct banks	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1840	U/G Conduit-Ducts	$ 861	$ -	$ -	$ 861	$ 107	$ 18	$ -	$ 125	$ 737
47	1840	U/G Conduit-UG Foundations	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1845	Underground Conductors & Devices	$ 579,208	$ 35,000	$ -	$ 614,208	$ 86,053	$ 16,511	$ -	$ 102,564	$ 511,644
47	1850	Distribution Transformers - Overhead	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1850	Distribution Transformers - Inventory	$ 146,973	$ -	$ -	$ 146,973	$ -	$ 1,837	$ -	$ 1,837	$ 145,136
47	1850	Distribution Transformers - UG Pad-Mounted Trans	$ 523,168	$ 45,000	$ -	$ 568,168	$ 93,245	$ 18,182	$ -	$ 111,427	$ 456,741
47	1850	Distribution Transformers - OH Trans & Voltage Reg	$ 687,955	$ 20,000	$ -	$ 707,955	$ 96,724	$ 20,606	$ -	$ 117,330	$ 590,625
47	1855	Distribution Services - UG Secondary in Duct	$ 217,376	$ 25,000	$ -	$ 242,376	$ 18,216	$ 4,040	$ -	$ 22,256	$ 220,120
47	1855	Distribution Services - OH Conductors	$ 233,841	$ 10,000	$ -	$ 243,841	$ 27,577	$ 6,395	$ -	$ 33,973	$ 209,868
47	1860	Distribution Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters - Inventory	$ 12,666	$ -	$ -	$ 12,666	$ 6,597	$ 1,100	$ -	$ 7,697	$ 4,969
47	1860	Distribution Meters - Residential Energy Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters - Ind/Com Energy Meters	$ 7,848	$ -	$ -	$ 7,848	$ 2,288	$ 381	$ -	$ 2,670	$ 5,178
47	1860	Distribution Meters - Wholesale Energy Meters	$ 91,614	$ -	$ -	$ 91,614	$ 21,116	$ 4,022	$ -	$ 25,138	$ 66,476
47	1860	Distribution Meters - Current & Potential Meters	$ 53,390	$ -	$ -	$ 53,390	$ 7,671	$ 2,137	$ -	$ 9,808	$ 43,582
47	1860	Distribution Meters-Smart	$ 785,897	$ 50,000	-$ 20,000	$ 815,897	$ 253,485	$ 66,921	$ -	$ 320,406	$ 495,490
47	1860	Distribution Meters-Smart-Repeaters	$ 240	$ -	$ -	$ 240	$ 240	$ -	$ -	$ 240	$ -
47	1860	Distribution Meters-Smart-Data Collectors	$ 20,053	$ -	$ -	$ 20,053	$ 19,753	$ 199	$ -	$ 19,953	$ 100
47	1860	Distribution Meters-Stranded	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1860	Distribution Meters-Inventory	$ 79,235	$ -	$ -	$ 79,235	$ -	$ 2,641	$ -	$ 2,641	$ 76,594
N/A	1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
13	1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (10 years)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1915	Office Furniture & Equipment (5 years)	$ 68,236	$ -	$ -	$ 68,236	$ 29,985	$ 6,609	$ -	$ 36,594	$ 31,641
10	1920	Computer Equipment - Hardware	$ 321,833	$ 80,000	$ -	$ 401,833	$ 230,353	$ 45,743	$ -	$ 276,096	$ 125,737
45	1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -		$ -	$ -	$ -	$ -	$ -	$ -	$ -
45.1	1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ -		$ -	$ -	$ -	$ -	$ -	$ -	$ -
10	1930	Transportation Equipment - Trucks and Buckets	$ 383,965	$ 345,000	$ -	$ 728,965	$ 293,348	$ 48,099	$ -	$ 341,447	$ 387,518
10	1930	Transportation Equipment - Trailers	$ 2,478	$ -	$ -	$ 2,478	$ 2,478	$ -	$ -	$ 2,478	$ -
10	1930	Transportation Equipment - Pick-ups/Vans/Cars	$ 102,568	$ -	$ -	$ 102,568	$ 49,258	$ 15,180	$ -	$ 64,438	$ 38,131
8	1935	Stores Equipment	$ 1,497	$ -	$ -	$ 1,497	$ 1,416	$ 81	$ -	$ 1,497	$ -
8	1940	Tools, Shop & Garage Equipment	$ 25,665	$ 3,000	$ -	$ 28,665	$ 9,419	$ 2,620	$ -	$ 12,039	$ 16,626
8	1945	Measurement & Testing Equipment	$ 24,683	$ -	$ -	$ 24,683	$ 6,171	$ 2,468	$ -	$ 8,639	$ 16,044
8	1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1955	Communications Equipment	$ 23,244	$ -	$ -	$ 23,244	$ 18,931	$ 2,797	$ -	$ 21,728	$ 1,517
8	1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
8	1960	Miscellaneous Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1980	System Supervisor Equipment	$ 283,636	$ 15,000	$ -	$ 298,636	$ 168,949	$ 23,531	$ -	$ 192,480	$ 106,156
47	1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
47	1995	Contributions & Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
	2440	Deferred Revenue	-$ 459,496	-$ 20,000	$ -	-$ 479,496	-$ 47,921	-$ 13,000	$ -	-$ 60,921	-$ 418,575
		Sub-Total	**$ 11,736,295**	**$ 963,000**	**-$ 20,000**	**$ 12,679,295**	**$ 2,536,132**	**$ 510,067**	**$ -**	**$ 3,046,199**	**$ 9,633,096**

Table 14 – 2018 ACM MS3 Substation: Incremental Capital Assets (Acct 1508)

2018	1508 - Incremental Capital Assets				Year	2018					
			Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
47	1508-1500-508-501	Sub Stations Power - Overall	$0	$402,938	$0	$402,938	$0	$4,477	$0	$4,477	$398,461
47	1508-1500-508-502	Sub Stations Power - Bushing	$0	$0	$0	$0	$0	$0	$0	$0	$0
47	1508-1500-508-503	Sub Stations Power - Tap Changer	$0	$0	$0	$0	$0	$0	$0	$0	$0
47	1508-1500-508-504	Sub Stations Switchgear - Overall	$0	$231,666	$0	$231,666	$0	$2,896	$0	$2,896	$228,770
47	1508-1500-508-505	Sub Stations - Station Switch	$0	$682,029	$0	$682,029	$0	$6,820	$0	$6,820	$675,209
47	1508-1500-508-506	Sub Stations - Rigid Busbars	$0	$0	$0	$0	$0	$0	$0	$0	$0
47	1508-1500-508-507	Sub Stations - Steel Structure	$0	$163,086	$0	$163,086	$0	$1,631	$0	$1,631	$161,455
47	1508-1500-508-508	Sub Stations - Fence	$0	$36,241	$0	$36,241	$0	$725	$0	$725	$35,517
47	1508-1500-508-509	Poles Towers & Fixtures - Wood	$0	$54,449	$0	$54,449	$0	$546	$0	$546	$53,904
47	1508-1500-508-510	O/H Conductors & Devices - Conductors	$0	$36,259	$0	$36,259	$0	$302	$0	$302	$35,957
47	1508-1500-508-511	U/G Conductors & Devices	$0	$5,780	$0	$5,780	$0	$72	$0	$72	$5,708
47	1508-1500-508-512	Reg - ICE Stn Services	$0	$54,445	$0	$54,445	$0	$681	$0	$681	$53,764
47	1508-1500-508-513	SCADA	$0	$26,000	$0	$26,000	$0	$1,300	$0	$1,300	$24,700
			$0	**$1,692,893**				**$19,449**			**$1,673,444**

Table 15 – 2019 ACM MS3 Substation: Incremental Capital Assets (Acct 1508)

2019	1508 - Incremental Capital Assets			Year	2019					
		Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
1508-1500-508-501	Sub Stations Power - Overall	$402,938	$0	$0	$402,938	$4,477	$8,954	$0	$13,431	$389,507
1508-1500-508-502	Sub Stations Power - Bushing	$0	$0	$0	$0	$0	$0	$0	$0	$0
1508-1500-508-503	Sub Stations Power - Tap Changer	$0	$0	$0	$0	$0	$0	$0	$0	$0
1508-1500-508-504	Sub Stations Switchgear - Overall	$231,666	$0	$0	$231,666	$2,896	$5,792	$0	$8,687	$222,978
1508-1500-508-505	Sub Stations - Station Switch	$682,029	$0	$0	$682,029	$6,820	$13,641	$0	$20,461	$661,568
1508-1500-508-506	Sub Stations - Rigid Busbars	$0	$0	$0	$0	$0	$0	$0	$0	$0
1508-1500-508-507	Sub Stations - Steel Structure	$163,086	$0	$0	$163,086	$1,631	$3,262	$0	$4,893	$158,194
1508-1500-508-508	Sub Stations - Fence	$36,241	$0	$0	$36,241	$725	$1,450	$0	$2,174	$34,067
1508-1500-508-509	Poles Towers & Fixtures - Wood	$54,449	$0	$0	$54,449	$546	$1,151	$0	$1,696	$52,753
1508-1500-508-510	O/H Conductors & Devices - Conductors	$36,259	$0	$0	$36,259	$302	$604	$0	$906	$35,352
1508-1500-508-511	U/G Conductors & Devices	$5,780	$0	$0	$5,780	$72	$145	$0	$217	$5,563
1508-1500-508-512	Reg - ICE Stn Services	$54,445	$0	$0	$54,445	$681	$1,361	$0	$2,042	$52,403
1508-1500-508-513	SCADA	$26,000	$0	$0	$26,000	$1,300	$2,600	$0	$3,900	$22,100
		$1,692,893	**$0**				**$38,958**			**$1,634,485**

Table 16 – Bridge Year 2020 ACM MS3 Substation: Incremental Capital Assets (Acct 1508)

2020	1508 - Incremental Capital Assets			Year	2020					
		Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
1508-1500-508-501	Sub Stations Power - Overall	$402,938	$0	$0	$402,938	$13,431	$8,954	$0	$22,385	$380,552
1508-1500-508-502	Sub Stations Power - Bushing	$0	$0	$0	$0	$0	$0	$0	$0	$0
1508-1500-508-503	Sub Stations Power - Tap Changer	$0	$0	$0	$0	$0	$0	$0	$0	$0
1508-1500-508-504	Sub Stations Switchgear - Overall	$231,666	$0	$0	$231,666	$8,687	$5,792	$0	$14,479	$217,187
1508-1500-508-505	Sub Stations - Station Switch	$682,029	$0	$0	$682,029	$20,461	$13,641	$0	$34,101	$647,928
1508-1500-508-506	Sub Stations - Rigid Busbars	$0	$0	$0	$0	$0	$0	$0	$0	$0
1508-1500-508-507	Sub Stations - Steel Structure	$163,086	$0	$0	$163,086	$4,893	$3,262	$0	$8,154	$154,932
1508-1500-508-508	Sub Stations - Fence	$36,241	$0	$0	$36,241	$2,174	$1,450	$0	$3,624	$32,617
1508-1500-508-509	Poles Towers & Fixtures - Wood	$54,449	$0	$0	$54,449	$1,696	$1,151	$0	$2,847	$51,602
1508-1500-508-510	O/H Conductors & Devices - Conductors	$36,259	$0	$0	$36,259	$906	$604	$0	$1,511	$34,748
1508-1500-508-511	U/G Conductors & Devices	$5,780	$0	$0	$5,780	$217	$145	$0	$361	$5,419
1508-1500-508-512	Reg - ICE Stn Services	$54,445	$0	$0	$54,445	$2,042	$1,361	$0	$3,403	$51,042
1508-1500-508-513	SCADA	$26,000	$0	$0	$26,000	$3,900	$2,600	$0	$6,500	$19,500
		$1,692,893	**$0**				**$38,958**			**$1,595,527**

Table 17 – Test Year 2021 Continuity Schedule including Addition of MS3 Substation: Incremental Capital Assets

		Cost				Accumulated Depreciation				
OEB	Description	Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
1609	Capital Contributions Paid	$ 838,765	$ -	$ -	$ 838,765	$ 150,978	$ 33,551	$ -	$ 184,528	$ 654,237
1611	Computer Software (Formally known as Account 1925)	$ 374,935	$ 53,000	$ -	$ 427,935	$ 279,964	$ 37,677	$ -	$ 317,641	$ 110,294
1612	Land Rights (Formally known as Account 1906 and 1806)	$ 28,651	$ -	$ -	$ 28,651	$ -	$ -	$ -	$ -	$ 28,651
1805	Land	$ 41,988	$ -	$ -	$ 41,988	$ -	$ -	$ -	$ -	$ 41,988
1808	Buildings & Fixtures - MF Building	$ 217,047	$ -	$ -	$ 217,047	$ 30,329	$ 4,503	$ -	$ 34,832	$ 182,215
1808	Buildings & Fixtures - MF Fence/Parking/Roof	$ 45,067	$ -	$ -	$ 45,067	$ 13,827	$ 2,110	$ -	$ 15,937	$ 29,129
1808	Buildings & Fixtures - MF Fixture/Flooring	$ 67,585	$ 25,000	$ -	$ 92,585	$ 26,925	$ 5,669	$ -	$ 32,594	$ 59,991
1808	Buildings & Fixtures - MF HVAC/Plumbing/Comm	$ 71,472	$ 25,000	$ -	$ 96,472	$ 19,837	$ 5,298	$ -	$ 25,135	$ 71,338
1808	Buildings & Fixtures - AR Building	$ 3,421	$ -	$ -	$ 3,421	$ 404	$ 58	$ -	$ 461	$ 2,960
1808	Buildings & Fixtures - AR Fence/Parking/Roof	$ 10,882	$ -	$ -	$ 10,882	$ 3,627	$ 518	$ -	$ 4,146	$ 6,736
1808	Buildings & Fixtures - E.S. Shed Building	$ 32,500	$ -	$ -	$ 32,500	$ 4,311	$ 616	$ -	$ 4,927	$ 27,573
1808	Buildings & Fixtures - E.S. Shed Fixture/Flooring	$ 2,169	$ -	$ -	$ 2,169	$ 2,169	$ -	$ -	$ 2,169	-$ 0
1808	Buildings & Fixtures - E.S. Shed Fence/Parking/Roof	$ 1,067	$ -	$ -	$ 1,067	$ 498	$ 71	$ -	$ 569	$ 498
1808	Buildings & Fixtures - W.S. Shed	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1810	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1815	Transformer Station Equipment >50 kV	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1820	Sub Stations Power - Overall	$ 1,173,067	$ -	$ -	$ 1,173,067	$ 131,748	$ 27,394	$ -	$ 159,142	$ 1,013,925
1820	Sub Stations Power - Bushing	$ 27,469	$ -	$ -	$ 27,469	$ 8,492	$ 1,509	$ -	$ 10,001	$ 17,468
1820	Sub Stations Power - Tap Changer	$ 32,006	$ -	$ -	$ 32,006	$ 15,628	$ 2,097	$ -	$ 17,725	$ 14,281
1820	Sub Stations Switchgear - Overall	$ 602,948	$ -	$ -	$ 602,948	$ 77,847	$ 16,807	$ -	$ 94,654	$ 508,294
1820	Sub Stations - Station Switch	$ 965,452	$ -	$ -	$ 965,452	$ 66,424	$ 19,720	$ -	$ 86,144	$ 879,308
1820	Sub Stations - Rigid Busbars	$ 17,731	$ -	$ -	$ 17,731	$ 2,959	$ 423	$ -	$ 3,381	$ 14,350
1820	Sub Stations - Steel Structure	$ 224,589	$ -	$ -	$ 224,589	$ 16,047	$ 4,648	$ -	$ 20,694	$ 203,895
1820	Sub Stations - Fence	$ 104,907	$ -	$ -	$ 104,907	$ 21,009	$ 4,315	$ -	$ 25,324	$ 79,583
1825	Storage Battery Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1830	Poles Towers & Fixtures - Wood	$ 3,020,279	$ 170,000	$ -	$ 3,190,279	$ 421,590	$ 76,329	$ -	$ 497,919	$ 2,692,360
1830	Poles Towers & Fixtures - Concrete	$ 159,567	$ -	$ -	$ 159,567	$ 20,957	$ 2,994	$ -	$ 23,951	$ 135,616
1830	Poles Towers & Fixtures - Steel	$ 2,521	$ -	$ -	$ 2,521	$ 333	$ 48	$ -	$ 381	$ 2,141
1830	Poles Towers & Fixtures - Switches	$ 41,920	$ -	$ -	$ 41,920	$ 5,050	$ 932	$ -	$ 5,982	$ 35,938
1835	O/H Conductors & Devices - Conductors	$ 1,034,970	$ 82,000	$ -	$ 1,116,970	$ 95,967	$ 19,581	$ -	$ 115,549	$ 1,001,422
1835	O/H Conductors & Devices - Line Switch	$ 31,651	$ -	$ -	$ 31,651	$ 2,231	$ 704	$ -	$ 2,935	$ 28,716
1835	O/H Conductors & Devices - Reclosers	$ 304,704	$ -	$ -	$ 304,704	$ 39,572	$ 7,914	$ -	$ 47,486	$ 257,218
1840	U/G Conduit-Concret encased duct banks	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1840	U/G Conduit-Ducts	$ 861	$ -	$ -	$ 861	$ 125	$ 18	$ -	$ 142	$ 719
1840	U/G Conduit-UG Foundations	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1845	Underground Conductors & Devices	$ 619,988	$ 39,000	$ -	$ 658,988	$ 102,925	$ 17,581	$ -	$ 120,506	$ 538,482
1850	Distribution Transformers - Overhead	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1850	Distribution Transformers - Inventory	$ 146,973	$ -	$ -	$ 146,973	$ 1,837	$ 3,674	$ -	$ 5,511	$ 141,462
1850	Distribution Transformers - UG Pad-Mounted Trans	$ 568,168	$ 40,000	$ -	$ 608,168	$ 111,427	$ 19,244	$ -	$ 130,671	$ 477,497
1850	Distribution Transformers - OH Trans & Voltage Reg	$ 707,955	$ 20,000	$ -	$ 727,955	$ 117,330	$ 21,106	$ -	$ 138,436	$ 589,519
1855	Distribution Services - UG Secondary in Duct	$ 296,821	$ 30,000	$ -	$ 326,821	$ 25,658	$ 5,859	$ -	$ 31,517	$ 295,303
1855	Distribution Services - OH Conductors	$ 243,841	$ 10,000	$ -	$ 253,841	$ 33,973	$ 6,645	$ -	$ 40,618	$ 213,223
1860	Distribution Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1860	Distribution Meters - Inventory	$ 12,666	$ -	$ -	$ 12,666	$ 7,697	$ 1,100	$ -	$ 8,797	$ 3,869
1860	Distribution Meters - Residential Energy Meters	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1860	Distribution Meters - Ind/Com Energy Meters	$ 7,848	$ -	$ -	$ 7,848	$ 2,670	$ 381	$ -	$ 3,051	$ 4,797
1860	Distribution Meters - Wholesale Energy Meters	$ 91,614	$ -	$ -	$ 91,614	$ 25,138	$ 4,022	$ -	$ 29,160	$ 62,453
1860	Distribution Meters - Current & Potential Meters	$ 53,390	$ -	$ -	$ 53,390	$ 9,808	$ 2,137	$ -	$ 11,945	$ 41,445
1860	Distribution Meters-Smart	$ 815,897	$ 50,000	-$ 20,000	$ 845,897	$ 320,406	$ 70,250	$ -	$ 390,656	$ 455,240
1860	Distribution Meters-Smart-Repeaters	$ 240	$ -	$ -	$ 240	$ 240	$ -	$ -	$ 240	$ -
1860	Distribution Meters-Smart-Data Collectors	$ 20,053	$ -	$ -	$ 20,053	$ 19,953	$ 100	$ -	$ 20,053	$ -
1860	Distribution Meters-Stranded	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1860	Distribution Meters-Inventory	$ 79,235	$ -	$ -	$ 79,235	$ 2,641	$ 5,282	$ -	$ 7,924	$ 71,312
1905	Land	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1908	Buildings & Fixtures	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1910	Leasehold Improvements	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1915	Office Furniture & Equipment (10 years)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1915	Office Furniture & Equipment (5 years)	$ 68,236	$ 7,500	$ -	$ 75,736	$ 36,594	$ 6,984	$ -	$ 43,579	$ 32,157
1920	Computer Equipment - Hardware	$ 401,833	$ 110,000	$ -	$ 511,833	$ 276,096	$ 46,772	$ -	$ 322,869	$ 188,964
1920	Computer Equip.-Hardware(Post Mar. 22/04)	$ -		$ -	$ -	$ -	$ -	$ -	$ -	$ -
1920	Computer Equip.-Hardware(Post Mar. 19/07)	$ -		$ -	$ -	$ -	$ -	$ -	$ -	$ -
1930	Transportation Equipment - Trucks and Buckets	$ 728,965	$ -	$ -	$ 728,965	$ 341,447	$ 65,259	$ -	$ 406,705	$ 322,259
1930	Transportation Equipment - Trailers	$ 2,478	$ -	$ -	$ 2,478	$ 2,478	$ -	$ -	$ 2,478	$ -
1930	Transportation Equipment - Pick-ups/Vans/Cars	$ 102,568	$ -	$ -	$ 102,568	$ 64,438	$ 15,180	$ -	$ 79,618	$ 22,951
1935	Stores Equipment	$ 1,497	$ -	$ -	$ 1,497	$ 1,497	$ -	$ -	$ 1,497	$ -
1940	Tools, Shop & Garage Equipment	$ 28,665	$ 2,500	$ -	$ 31,165	$ 12,039	$ 2,895	$ -	$ 14,934	$ 16,231
1945	Measurement & Testing Equipment	$ 24,683	$ -	$ -	$ 24,683	$ 8,639	$ 2,468	$ -	$ 11,107	$ 13,576
1950	Power Operated Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1955	Communications Equipment	$ 23,244	$ -	$ -	$ 23,244	$ 21,728	$ 1,457	$ -	$ 23,185	$ 59
1955	Communication Equipment (Smart Meters)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1960	Miscellaneous Equipment	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1970	Load Management Controls Customer Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1975	Load Management Controls Utility Premises	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1980	System Supervisor Equipment	$ 324,636	$ -	$ -	$ 324,636	$ 198,980	$ 26,881	$ -	$ 225,861	$ 98,775
1985	Miscellaneous Fixed Assets	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1990	Other Tangible Property	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
1995	Contributions & Grants	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
2440	Deferred Revenue	-$ 479,496	-$ 30,000	$ -	-$ 509,496	-$ 60,921	-$ 13,500	$ -	-$ 74,421	-$ 435,075
	Sub-Total	**$ 14,372,188**	$ 634,000	-$ 20,000	**$ 14,986,188**	**$ 3,143,565**	$ 587,282	$ -	**$ 3,730,847**	**$ 11,255,340**

Table 18 – Test Year 2021 ACM MS3 Substation: Incremental Capital Assets (Acct 1508)

2020	1508 - Incremental Capital Assets			Year	2021					
		Opening Balance	Additions	Disposals	Closing Balance	Opening Balance	Additions	Disposals	Closing Balance	Net Book Value
1508-1500-508-501	Sub Stations Power - Overall	$402,938	$0	($402,938)	$0	$22,385	$0	($22,385)	$0	$0
1508-1500-508-502	Sub Stations Power - Bushing	$0	$0	$0	$0	$0	$0	$0	$0	$0
1508-1500-508-503	Sub Stations Power - Tap Changer	$0	$0	$0	$0	$0	$0	$0	$0	$0
1508-1500-508-504	Sub Stations Switchgear - Overall	$231,666	$0	($231,666)	$0	$14,479	$0	($14,479)	$0	$0
1508-1500-508-505	Sub Stations - Station Switch	$682,029	$0	($682,029)	$0	$34,101	$0	($34,101)	$0	$0
1508-1500-508-506	Sub Stations - Rigid Busbars	$0	$0	$0	$0	$0	$0	$0	$0	$0
1508-1500-508-507	Sub Stations - Steel Structure	$163,086	$0	($163,086)	$0	$8,154	$0	($8,154)	$0	$0
1508-1500-508-508	Sub Stations - Fence	$36,241	$0	($36,241)	$0	$3,624	$0	($3,624)	$0	$0
1508-1500-508-509	Poles Towers & Fixtures - Wood	$54,449	$0	($54,449)	$0	$2,847	$0	($2,847)	$0	$0
1508-1500-508-510	O/H Conductors & Devices - Conductors	$36,259	$0	($36,259)	$0	$1,511	$0	($1,511)	$0	$0
1508-1500-508-511	U/G Conductors & Devices	$5,780	$0	($5,780)	$0	$361	$0	($361)	$0	$0
1508-1500-508-512	Reg - ICE Stn Services	$54,445	$0	($54,445)	$0	$3,403	$0	($3,403)	$0	$0
1508-1500-508-513	SCADA	$26,000	$0	($26,000)	$0	$6,500	$0	($6,500)	$0	$0
		$1,692,893	**$0**				**$0**			**$0**

The above table shows the clearance of incremental capital assets from Account 1508 in 2021 as a result of transferring the assets into the 2021 rate-base

2.2 GROSS ASSETS

2.2.1 GROSS ASSET VARIANCE ANALYSIS

The table on the following page (OEB Appendix 2-AB Capital Expenditures) summarizes the gross capital additions of assets for the current distribution system plan investment period 2016 to 2020 and the proposed period of 2021 to 2025, group by OEB categories.

Accounting treatment of the cost of funds for construction work-in-progress

Virtually all of WNP's capital work is completed within the same fiscal year. In the event that a project does span over multiple years, WNP will follow the OEB's accounting processes and use account 2055-Work In Progress.

WNP confirms there were no expenditures for non-distribution activities in the LDC's capital investment plan or actual expenditures for 2016-2020 or for forecasted expenditures for 2021-2025.

The table below compares WNP’s actual capital expenditure versus planned for the historical period 2016 to 2020 and the plan investment period of 2021 to 2025 by OEB investment category:

Table 19 - OEB Appendix 2-AB Capital Expenditures[10]

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	55	39	-29.6%	240	77	-67.8%	240	141	-41.4%	240	64	-73.5%	60	25	-59.0%	70	70	70	70	85
System Renewal	90	113	25.7%	390	454	16.5%	1,932	2,012	4.2%	290	476	64.0%	450	67	-85.1%	340	265	265	315	315
System Service	1,373	1,307	-4.8%	-	11	--	-	55	--	-	5	--	-	1	--	27	19	21	82	14
General Plant	76	86	14.1%	139	170	22.7%	24	22	-8.9%	422	131	-69.1%	473	189	-60.1%	191	598	151	151	180
TOTAL EXPENDITURE	1,594	1,546	-3.0%	769	713	-7.3%	2,196	2,230	1.5%	952	675	-29.1%	983	282	-71.3%	627	952	507	617	594
Capital Contributions		- 12	--			--			--		- 26	--	- 20		-100.0%	- 20	- 20	- 20	- 20	- 20
Net Capital Expenditures		1,534	--		713	--		2,230	--		649	--	963	282	-70.7%	607	932	487	597	574
System O&M	$ 651	$ 661	1.6%	$667	$667	-0.1%	$ 684	$ 638	-6.8%	$701	$621	-11.4%	$719	$ 313	-56.5%	$705	$719	$ 733	$748	$ 763

[10] MFR - Complete Appendix 2-AB - historical years must be actuals, forecasts for the bridge and test years

The table below summarizes (a) WNP 2015 DSP plan, (b) the Actual CapEx spent by the utility and (c) the variance between Actual to Plan (Budget) all by OEB investment category. [11]

Table 20– DSP Plan (Budget) versus Actual CapEx

DSP Approved:					
	2016	2017	2018	2019	2020
System Access	$55,000	$240,000	$240,000	$240,000	$60,000
System Renewal	$90,000	$390,000	$1,932,000	$290,000	$450,000
System Service	$1,373,217	$0	$0	$0	$0
General Plant	$75,694	$138,670	$24,470	$421,850	$453,000
Total	**$1,593,911**	**$768,670**	**$2,196,470**	**$951,850**	**$963,000**
Cumulative Total	25%	36%	70%	85%	100%
Actual CapEx:	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Actual 2020
System Access	$38,722	$77,353	$140,741	$63,630	$24,571
System Renewal	$113,170	$454,353	$2,012,186	$475,616	$67,051
System Service	$1,307,297	$10,954	$54,500	$5,180	$1,377
General Plant	$86,356	$170,195	$22,304	$130,557	$188,911
Total	**$1,545,545**	**$712,855**	**$2,229,731**	**$674,983**	**$281,910**
Cumulative Total	24%	35%	69%	80%	84%
Variance: Actual to Budget					
	2016	2017	2018	2019	2020
Total	-3%	-7%	2%	-29%	-71%
Variance: Actual to Budget					
	2016	2017	2018	2019	2020
System Access	-$16,278	-$162,647	-$99,259	-$176,370	-$35,429
System Renewal	$23,170	$64,353	$80,186	$185,616	-$382,949
System Service	-$65,920	$10,954	$54,500	$5,180	$1,377
General Plant	$10,662	$31,525	-$2,166	-$291,293	-$264,089
Total	**-$48,367**	**-$55,815**	**$33,261**	**-$276,867**	**-$681,090**

Historical Plan Period - Variances between Plan and Actual. [12]

Detailed below are the factors that resulted in a material variance of =/+ $50,000 per year by OEB investment category for the historical 5-year period of 2016-2020:

[11] MFR – Overall summary of capital expenditures for the past five historical years, including the last OEB-approved amounts.
[12] MFR – Explanation of the year-over-year capital expenditure variances and an explanation of the variance. If any, between the OEB-approved capital expenditure amount in the last rebasing year as compared to the actual expenditures for that year.

- **Variance Analysis: 2016 CapEx Plan Versus Actual:**

Table 21 - Variance Analysis: 2016

	2016			
Category	Plan	Actual	Var	
System Access	$ 55,000	$ 38,722	$ (16,278)	-29.6%
System Renewal	$ 90,000	$ 113,170	$ 23,170	25.7%
System Service	$ 1,373,217	$ 1,307,297	$ (65,920)	-4.8%
General Plant	$ 75,694	$ 86,356	$ 10,662	14.1%
Total CapEx	**$1,593,911**	**$1,545,545**	$ (48,367)	**-3.0%**

- **System Service: 2nd 44kV Feeder.**

In 2016, with assistance from Hydro One Networks Inc. (HONI), WNP installed a new 44kV feeder to the Town of Mount Forest to address capacity and reliability concerns. This capital investment project was included in WNP's 2015 Distribution System Plan[13] with an estimated total project cost, as at February 2016, of $1,373,217 which included the following items:

Table 22 - 2016 2nd Line 44kV Feeder Estimates versus Actuals

Project Component	Estimated Cost	Actual Cost	Variance
Hydro One work involving construction of 11 km line expansion to the south end of Mount Forest	$881,156	$838,434	($42,722)
Hydro One's capacity study of the current feeder to Mount Forest	$32,061	$32,061	$0
New Primary Metering Equipment	$80,000	$87,639	$7,639
WNP pole-line work to connect new feeder to LDC's existing system	$380,000	$350,293	($29,707)
Total	**$1,373,217**	**$1,308,427**	**($64,790)**

The 2nd line 44kV feeder project was completed in 2016, energized in December 2016 and under budget as illustrated above. In May 2016, WNP entered into a Capital Cost Recovery Agreement (CCRA) with Hydro One based upon a 50/50 split of HONI's total cost for construction of 11 km line expansion to the south end of Mount Forest – the CCRA amount

[13] Wellington North Power Inc. 2015 Distribution System Plan (filed with its Cost of Service application: EB-2015-0110) – Section 5.4.5.3 Special Capital Projects; sub-section 5.4.5.3.1 Second 44kV Feeder to Mount Forest

was $838,434(before HST) which was below HONI's quote of $881,156 (before HST, quote as at February 2016).

- **Variance Analysis: 2017 CapEx Plan Versus Actual:**

Table 23 - Variance Analysis: 2017

Category	2017 Plan	2017 Actual	2017 Var	
System Access	$ 240,000	$ 77,353	$ (162,647)	-67.8%
System Renewal	$ 390,000	$ 454,353	$ 64,353	16.5%
System Service	$ -	$ 10,954	$ 10,954	
General Plant	$ 138,670	$ 170,195	$ 31,525	22.7%
Total CapEx	**$ 768,670**	**$ 712,855**	$ (55,815)	**-7.3%**

System Access: Residential & Small Business meter replacement project.

In WNP's 2015 DSP, the LDC included a budget for "Residential & Small Business meter replacement project" under Service Access. The utility was planning to replace its Smart meters over a 3-year period of 2017 to 2019 with an annual budget of $180,000 as meters were approaching their 10-year meter seal life as recognized by Measurement Canada. At the time of filing its 2015 DSP, it was unknown to WNP whether sampling would produce results that would allow for the meters to be "re-sealed" for an additional eight years. Therefore WNP included the estimate for full replacement of meters.

While Kinectrics Inc. proposes that Smart Meters have an asset life of 15 years, Measurement Canada stipulates an asset life for smart meters of only 10 years. By having the meters tested and resealed, WNP decided it would be in the interest of its rate-payers not to replace the meters but to have them re-verified and resealed, extending the useful lives of the meters by 8 years.. Also, WNP revised the OEB investment for this project from "System Access" to "System Renewal" as the assets' life, according to Measurement Canada, has been extended (renewed). The table below summarizes the variances between Plan and Actual as well as category change:

Table 24 - 2017 Meter Replacement Project Amended to Meter Reverification

Project	Category	Plan	Actual	Variance
Residential & Small Business meter replacement project	System Access	$180,000		($122,604)
Residential & Small Business meters sample tested, re-verified and resealed	System Renewal		$57,396	

System Renewal: Pole-line Rebuild – Queen Street West

In 2017, the Township planned to resurface the road and sidewalk of Queen Street West in Mount Forest. The assets located in this area were circa 1975 and approaching the end of their life. The existing Class 6 poles were replaced with Class 3 poles to meet current construction and safety standards. The porcelain insulators were replaced with safer polymer type insulators. During this period there was discussion regarding a potential new develop at the far west end of Queen St W. It was decided that the far end rebuild would be deferred until a further investigation of the potential development was completed.

Table 25 - 2017 Pole-line Line Project Variance Analysis

Project	Category	Plan	Actual	Variance
Pole-line Rebuild – Queen Street West	System Renewal	$190,000	$101,715	($88,285)

- **Variance Analysis: 2018 CapEx Plan Versus Actual:**

Table 26 - Variance Analysis: 2018

	2018			
Category	Plan	Actual	Var	
System Access	$ 240,000	$ 140,741	$ (99,259)	-41.4%
System Renewal	$ 1,932,000	$ 2,012,186	$ 80,186	4.2%
System Service	$ -	$ 54,500	$ 54,500	
General Plant	$ 24,470	$ 22,304	$ (2,166)	-8.9%
Total CapEx	**$2,196,470**	**$2,229,731**	$ 33,261	**1.5%**

System Access: Residential & Small Business meter replacement project.

As noted in 2017, WNP elected to sample test, reverify and reseal Smart Meters rather than replace and revised the OEB investment for this project from “System Access” to “System

Renewal". The table below summarizes the variances between 2018 Plan and Actual as well as category change:

Table 27 - 2018 Meter Replacement Project Amended to Meter Reverification

Project	Category	Plan	Actual	Variance
Residential & Small Business meter replacement project	System Access	$180,000		($60,958)
Residential & Small Business meters sample tested, re-verified and resealed	System Renewal		$119,042	

System Renewal: Pole Line Rear to Front Conversion- Holstein Line Rebuild.

The Holstein Line Rebuild was a 2018 system renewal project included in WNP's 2015 DSP. The project was intended to facilitate the backyard to front yard conversion of several residential customers where the existing pole line supplying electricity to the rear fed lots travels through a field with no roadway. The project was estimated to cost $70,000, however the project did not proceed because:

i. During 2018, WNP replaced an aged substation (MS4) with a new substation. The Operations team were more involved in the project than initially planned, for instance helping with the tear-down of the old substation.
ii. Looking through outage records, there have been only three power outages in this area over the period 2012 to 2017.
iii. There have been no complaints or requests to move the service from the several residential customers that live in this area.
iv. The rear lot pole line remains accessible and although this access is not ideal, the project was too costly for the benefit gained.

Due to the above factors, the project did not happen; and at the time of preparing WNP's capital plan for 2021-2025, this project has not been included. Because this project did not start, this contributed to the 2017 variance:

Table 28 - 2018 Pole-line Line Project Variance Analysis

Project	Category	Plan	Actual	Variance
Pole-line Rebuild – Holstein Rear-Lot Conversion	System Renewal	$70,000	$0	($70,000)

System Service:

In 2018, WNP invested in safety protection and control equipment that was unplanned, i.e. not included in the LDC's 2015 DSP. Consequently, this caused an overage in spending in category System Service of:

Table 29 - 2018 Safety Protection and Control Equipment

Project	Category	Plan	Actual	Variance
Replacement of 4kV Gang Operated Switches replacing Single Solid Blade Switches.	System Service	$0	$42,347	$42,347
Delta Meter Upgrades. The Electrical Safety Authority (ESA) issued a bulletin for "Delta" services with "Wye" transformers and no neutral connections. WNP identified 10 locations in our service area upgrades were needed to connect the neutral or install a neutral conductor. Nine of the ten were completed in 2018 (the tenth location was completed in 2019).	System Service	$0	$6,654	$6,654
Replacement of 44kV Solid Blade Isolation Switch on load side of PME.	System Service	$0	$5,500	$5,500
Total		**$0**	**$54,500**	**$54,500**

- **Variance Analysis: 2019 CapEx Plan Versus Actual – System Access:**

Table 30 - Variance Analysis: 2019

	2019			
Category	Plan	Actual	Var	
System Access	$ 240,000	$ 63,630	$ (176,370)	-73.5%
System Renewal	$ 290,000	$ 480,796	$ 190,796	65.8%
System Service	$ -	$ -		
General Plant	$ 421,850	$ 130,557	$ (291,293)	-69.1%
Total CapEx	**$ 951,850**	**$ 674,983**	$ (276,867)	**-29.1%**

System Access: Residential & Small Business meter replacement project.

As noted in 2017, WNP elected to sample test, recertify and reseal Smart Meters rather than replace and revised the OEB investment for this project from "System Access" to "System

Renewal". The table below summarizes the variances between 2019 Plan and Actual as well as category change:

Table 31 - 2019 Meter Replacement Project Amended to Meter Reverification

Project	Category	Plan	Actual	Variance
Residential & Small Business meter replacement project	System Access	$180,000		($25,654)
Residential & Small Business meters sample tested, re-verified and resealed	System Renewal		$154,346	

In 2019, WNP were required to sample test more meters than in prior years because during the implementation of Smart meters, the majority of meters were delivered in 2010. These meters needed to be tested prior to their 10-year expiry meter seal date.

If the 2015 DSP-approved planned 2019 budget of $180,000 for the meter replacement project was transferred from "System Access" to "System Renewal", when compared to Actual spend, WNP's variance in these categories would be significantly below the materiality threshold of $50,000 as illustrated below:

Table 32 - 2019 Meter Replacement Project Amended to Meter Reverification

	2019					
Category	Plan	Adjustment for Meter Reverification (not Replacement)	Revised Plan	Actual	Var	
	[A]	[B]	[C] = [A] + [B]	[D]	[E] =[D] - [C]	
System Access	$240,000	-$180,000	$60,000	$63,630	$3,630	6.0%
System Renewal	$290,000	$180,000	$470,000	$480,796	$10,796	2.3%
System Service	$0			$0		
General Plant	$421,850			$130,557	-$291,293	-69.1%
Total CapEx	**$951,850**			**$674,983**	-$276,867	**-29.1%**

General Plant:

In WNP's 2015 DSP, the LDC planned to replace a bucket truck in 2019 with a budget amount of $250,000. During the quotation process it was deemed that delivery would not be until 2020 with a cost closer to $325,000. WNP also had a planned replacement of the Radial Boom Derrick "RBD" in 2020 with a budget of $345,000. WNP decided it would obtain new quotes for the RBD and defer its replacement since the vehicle remains in acceptable condition.

The purchase of the bucket truck is to be completed in 2020 and therefore WNP underspent by $250,000 in the "General Plant" investment category:

Table 33 - 2019 Fleet vehicle Replacement - Deferred

Project	Category	Plan	Actual	Variance
Replacement of 2007 Bucket Truck – deferred to 2020	General Plant	$250,000	$0	($250,000)

WNP has included the replacement of the 2004 RBD truck in the capital expenditure program for the 5 year period 2021 to 2025.

- **Variance Analysis 2020 CapEx Plan Versus Actual**

Table 34 - Variance Analysis: 2020

	2020		
Category	Plan	Actual	Var
System Access	$ 60,000	$ 24,571	-59.0%
System Renewal	$ 450,000	$ 67,051	-85.1%
System Service	$ -	$ 1,377	
General Plant	$ 453,000	$ 188,911	-58.3%
Total CapEx	**$ 963,000**	**$ 281,910**	**-70.7%**

** "2020 Actual" correct as at May 31st 2020.*

The above chart shows WNP's 2020 capital expenditure as at May 31st 2020. As a result of COVID-19 pandemic, like many utilities in Ontario, WNP has been delayed in starting its' construction capital projects for the year. The utility has adhered to public health guidelines and put in place safety measures to commence work on construction projects. Typically, engineered drawings and plans are completed by the end of March, enabling the Operations team to start construction in April; however due to COVID-19, the Operations team started construction work in mid-May 2020. WNP expects that the capital budget plans for 2020 will be able to be completed by the end of the year.

The tables below illustrate the gross fixed additions as a result of the capital investment by WNP from 2016 to 2020, as at May 31, 2020, for the four OEB categories.

Table 35 – Gross Fixed Asset Additions – System Access

System Access	Usoa	2016	2017	2018	2019	2020	2021
Meters	**1860**	$6,581	$14,088	$19,700	$12,761	$3,117	
Poles, towers, wires, fixtures, etc	**1830**	$19,970	$41,555	$81,393	$31,929	$9,811	
Line Transformer	**1850**	$12,171	$21,710	$39,648	$18,940	$11,643	
Sub-total system renewal		**$38,722**	**$77,353**	**$140,741**	**$63,630**	**$24,571**	
Deferred Revenue (Contrib Cap)	**2440**	$0	$0	$0	$0	$0	
Total system renewal		**$38,722**	**$77,353**	**$140,741**	**$63,630**	**$24,571**	

Table 36 – Gross Fixed Asset Additions – System Renewal

System Renewal	Usoa	2016	2017	2018	2019	2020	2021
Computer Hardware	**1920**			$6,179			
Poles towers fixtures only							
Computer Software	**1611**	$16,541	$0	$0	$18,462		
Meters	**1860**	$47,905	$82,093	$116,991	$154,902	$5,124	
Substations	**1820**	$16,593	$6,467	$1,692,893	$3,323	$0	
Poles, towers, wires, fixtures, etc	**1830**	$0	$296,335	$164,590	$253,513	$51,045	
Line Transformer	**1850**	$32,131	$69,458	$31,533	$45,416	$10,882	
Sub-total system renewal		**$113,170**	**$454,353**	**$2,012,186**	**$475,616**	**$67,051**	
Deferred Revenue (Contrib Cap)	**2440**	$0	$0	$0	-$25,804	$0	
Total system renewal		**$113,170**	**$454,353**	**$2,012,186**	**$449,812**	**$67,051**	

Table 37 – Gross Fixed Asset Additions – System Service

System Service	Usoa	2016	2017	2018	2019	2020	2021
Meters	**1860**	$52,319		$6,653			
Safety Switch/Blade Equip	**1830**		$10,954	$47,847	$5,180		
Poles, towers, wires, fixtures, etc	**1830**	$391,779					
System Safety Tools	**1940**					$1,377	
Line Transformer	**1850**	$24,434					
Capital Contributions Paid	**1609**	$838,765					
Sub-total system renewal		**$1,307,297**	**$10,954**	**$54,500**	**$5,180**	**$1,377**	
Deferred Revenue (Contrib Cap)	**2440**	$0	$0	$0	$0	$0	
Total system renewal		**$1,307,297**	**$10,954**	**$54,500**	**$5,180**	**$1,377**	

Table 38 – Gross Fixed Asset Additions – General Plant

General Plant	Usoa	2016	2017	2018	2019	2020	2021
Building	**1820**	$0	$29,677	$0	$1,215	$6,019	
Computer Hardware	**1920**	$22,953	$25,120	$15,460	$61,497	$10,829	
Transportation	**1930**		37,499		$38,401	$114,000	
Computer Software	**1611**	$51,812	$30,801	$4,700	$11,638	$58,063	
Line transformers	**1860**						
Tools	**1940**	$11,591	$47,098	$2,144	$17,806		
Sub-total system renewal		**$86,356**	**$170,195**	**$22,304**	**$130,557**	**$188,911**	
Deferred Revenue (Contrib Cap)	**2440**	$0	$0	$0	$0	$0	
Total system renewal		**$86,356**	**$170,195**	**$22,304**	**$130,557**	**$188,911**	

In compliance with the filing requirements, the capital additions are presented by traditional functions in the table below:

Table 39– Yearly investments by Traditional Functions[14]

Description		**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Computer Software (Formally known as Account 1925)		$68,353	$30,801	$4,700	$32,207	$60,000	$53,000
Tools, etc		$11,591	$47,098	$2,144	$17,806	$3,000	$0
Distribution Station Equipment <50 kV		$16,593	$6,467	$0	$3,323	$0	$0
Building		$0	$29,677	$0	$1,215	$45,000	$60,000
Poles, Towers & Fixtures		$411,749	$349,461	$234,872	$288,514	$315,000	$301,000
Line Transformers		$68,736	$75,239	$71,181	$78,677	$65,000	$60,000
Meters		$58,409	$0	$0	$13,317	$0	$0
Meters (Smart Meters)		$48,396	$142,891	$166,555	$129,151	$50,000	$50,000
Computer Equip.-Hardware(Post Mar. 22/04)		$22,953	$25,120	$21,639	$61,497	$80,000	$110,000
Transportation Equipment		$0	$37,499	$0	$38,401	$345,000	$0
Capital Contributions Paid		$838,765					
Sub-Total		**$1,545,545**	**$744,253**	**$501,091**	**$664,109**	**$963,000**	**$634,000**

[14] MFR - Breakdown by function and by major plant account; description of major plant items for test year

2.2.2 YEAR-OVER-YEAR VARIANCE ANALYSIS[15]

The table below summarizes WNP's gross capital expenditures by OEB investment category, contributed capital, and capital work-in-progress (CWIP) for the period January 1, 2016 to May 31, 2020:

Table 40 – Summary of Capital Expenditures, Capital Contributions and CWIP

	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Actual
System Access	$38,722	$77,353	$140,741	$63,630	$24,571
System Renewal	$113,170	$454,353	$2,012,186	$475,616	$67,051
System Service	$1,307,297	$10,954	$54,500	$5,180	$1,377
General Plant	$86,356	$170,195	$22,304	$130,557	$188,911
Total	$1,545,545	$712,855	$2,229,731	$674,983	$281,910
Capital Contributions	($11,555)	$0	$0	($25,840)	$0
CWIP	$12,461	$119,019	$747	$8,033	$0

* 2020 Actual as at May 31st 2020

- **Summary of 2016**
  - System Access expenditure for new services was lower than planned at $33,081. Typically, the LDC provisions for approx. $55,000 capital expenditure related to requests for new customer connections and modifications or amendments from the LDC's distribution equipment up to the entry point of the property. Work on developer planned projects accounted for only $5,641 capital expenditure.
  - System Renewal focused on non-discretionary asset replacement so as to help alleviate capital spending pressure to enable the LDC to accommodate the significant investment in System Service.
  - System Service included the sizable investment of a new 44kV feeder to the Town of Mount Forest to address capacity and reliability concerns which was included in WNP's 2015 Distribution System Plan[16]. The 2nd line 44kV feeder project was completed in 2016, energized in December 2016 and under budget at $1,307,297.

[15] MFR – Summary of capital expenditures and treatment of contributed capital, and additions and deductions from CWIP
[16] Wellington North Power Inc. 2015 Distribution System Plan (filed with its Cost of Service application: EB-2015-0110) – Section 5.4.5.3 Special Capital Projects; sub-section 5.4.5.3.1 Second 44kV Feeder to Mount Forest

- General Plant investment included a Customer Information System software upgrade, installation of security cameras as well as safety equipment and tools for the line-crew. The utility spent on non-discretionary asset replacement items so as to help alleviate capital spending pressure to enable the LDC to accommodate the significant investment in System Service.
- The Capital Contribution received in 2016 related to WNP installing Electric Vehicle Charging stations at Arthur and Mount Forest for the Township of Wellington North.

- **Year-over-Year Variance - 2017 compared to 2016**

The table below summarizes the change in spending of 2017 over 2016:

Table 41 – 2017 over 2016

Actual CapEx Spent:	Actual 2016	Actual 2017	Year Change
System Access	$38,722	$77,353	100%
System Renewal	$113,170	$454,353	301%
System Service	$1,307,297	$10,954	-99%
General Plant	$86,356	$170,195	97%
Total	**$1,545,545**	**$712,855**	-54%
Capital Contributions	-$11,555	$0	-100%
CWIP	$12,641	$119,019	842%

- System Access expenditure in 2017 increased to $44,017 and work on 3 developer planned projects totalling $33,336 accounted for the increase in spending in this category above 2016.
- System Renewal was considerably higher in 2017 because in 2016, the utility prioritized spending on non-discretionary projects to help accommodate the new 2nd line 44kV project; for instance, 2016 did not include any pole-line rebuild projects. In 2017, WNP spent $256,759 on pole-line rebuild projects, $70,668 on replacement of poles and transformers, installation of new transformer at $47,885, Smart meter reverification project at $57,396 and $21,645 on several minor system renewal initiatives.
- System Service expense of $10,954 related to additional equipment purchased for the new 2nd line 44kV feeder.

- General Plant investment in 2017 included the purchase of a replacement pick-up truck at $37,499, building renovations at $29,677, a Polux 5 pole-tester at $24,683, a new postage machine at $16,029 and a document-scanning software upgrade at $30,001. The remaining balance spent in this category related to IT, tools and safety equipment purchases.
- The CWIP balances related to $44,000 for MIST metering installation program that commenced in August 2017 and completed in early January 2018; a new transformer purchased for $27,000 but not energized within the year; and approx. $48,000 in poles and wires for a pole-line project that was not completed in the year.

○ **Year-over-Year Variance - 2018 compared to 2017**

The table below summarizes the change in spending of 2018 over 2017:

Table 42 – 2018 over 2017

Actual CapEx Spent:	Actual 2017	Actual 2018	Year Change
System Access	$77,353	$140,741	82%
System Renewal	$454,353	$2,012,186	343%
System Service	$10,954	$54,500	398%
General Plant	$170,195	$22,304	-87%
Total	**$712,855**	**$2,229,731**	213%
Capital Contributions	$0	$0	-
CWIP	$119,019	$747	-99%

- System Access expenditure in 2018 increased by 82% compared to 2017 and was largely due to an increase in new services. In 2018, capital investment for new services was $99,257 compared to $44,017 in 2017. The remaining $41,484 related to work on developer planned projects.
- System Renewal in 2018 saw WNP replacing its' MS3 substation with a capital investment of $1,692,893. The utility continued with its' Smart meter reverification project spending $119,042 in 2018 and spent $113,055 on pole-line re-build projects. Replacement of poles and transformers in 2018 was $81,562 and $5,634 was spent on replacing primary metering equipment.

- System Service expenditure in 2018 was for safety protection and control equipment including new 4kW switches at $42,347, Delta meter upgrades at $6,653 and 44kV solid blade at $5,500.
- General Plant expenditure was considerably lower than 2017 as there was no fleet replacement or building renovations in 2018. Also, items in General Plant category had already been re-prioritized to other years as the utility focused on non-discretionary projects in 2018 to help accommodate the replacement of its' MS3 substation so as to help alleviate capital spending pressures.

- **Year-over-Year Variance - 2019 compared to 2018**

The table below summarizes the change in spending of 2019 over 2018:

Table 43 – 2019 over 2018

Actual CapEx Spent:	Actual 2018	Actual 2019	Year Change
System Access	$140,741	$63,630	-55%
System Renewal	$2,012,186	$475,616	-76%
System Service	$54,500	$5,180	-90%
General Plant	$22,304	$130,557	485%
Total	**$2,229,731**	**$674,983**	-70%
Capital Contributions	$0	-$25,840	-
CWIP	$747	$8,033	975%

- System Access expenditure in 2019 decreased by 55% compared to 2018 and was largely due to a reduction on expenditure for new services at $50,913 for the year (compared to $99,257 in 2018).
- System Renewal expenditure in 2019 included $229,306 for pole line projects, $154,346 on Smart meter reverification project, $77,039 for replacement of poles and transformers, and $14,925 for several smaller items.
- System Service expenditure reduced by 90% in 2019 compared to 2018 as the utility purchased only one – a solid blade switch (safety protection and control equipment) at $5,180 for operation at its MS1 substation.

- General Plant in 2019 increased above 2018 spending levels predominately due to the purchase of a replacement pick-up truck at $38,401, replacement billing printer at $14,011, IT equipment at $73,135 and $5,010 on tools and equipment.
- Capital Contributions received in 2019 was from developers totalling $25,840.

○ **Year-over-Year Variance - 2020 compared to 2019**

The table below summarizes the change in spending of 2020 over 2019:

Table 44 – 2020 over 2019

Actual CapEx Spent:	Actual 2019	Actual 2020	Year Change
System Access	$63,630	$24,571	-61%
System Renewal	$475,616	$67,051	-86%
System Service	$5,180	$1,377	-73%
General Plant	$130,557	$188,911	45%
Total	**$674,983**	**$281,910**	-58%
Capital Contributions	-$25,840	$0	-
CWIP	$8,033	$0	-100%

* 2020 is as at May 31st 2020:

- System Access expenditure as at May 31, 2020 is $24,571 of which $21,643 relates to new services and the remainder being work for developer planned projects.
- System Renewal expenditure as at May 31, 2020 is $67,051 consisting of $34,593 for pole-line re-build projects and $32,458 for replacement of poles and transformers. The utility has planned to spend $260,000 on pole-line projects and $105,000 on an underground project in 2020.
- System Service expenditure to data relates to work on the LDC’s SCADA system and purchasing of line guards (safety equipment).
- General Plant expenditure as at May 31, 2020 is above 2019 because the utility is purchasing a new bucket truck in 2020. The new bucket truck is a fleet replacement for a 2007 bucket truck. In February 2020, WNP paid a deposit of $114,000 for the new bucket truck with a scheduled delivery date of November 2020.
- CWIP – the utility anticipates there will be some uncompleted (i.e. not in service or energized) capital construction projects in 2020 due to delays in commencing work on these projects due to COVID-19.

2.2.3 ACCUMULATED DEPRECIATION

WNP has adopted depreciation rates based on the Kinectrics Asset Depreciation Study which can be found at the following secure link:

https://www.oeb.ca/oeb/_Documents/EB-2010-0178/Kinetrics-418033-OEB%20Asset%20Amortization-%20Final%20Rep.pdf

The rates used are presented below, and the Continuity Schedules of the Accumulated Depreciation are presented in the table below. WNP's capitalization policy and methodology are provided on the next page. The depreciation expenses continuity schedules are presented in Exhibit 4.

The table below illustrates WNP's depreciable rates by asset class.

Table 45 - Depreciation Rates

Service Life Comparison Table F-1 from Kinectrics Report

		Asset Details			Useful Life			USoA Account Number	USoA Account Description	Current		Proposed		Outside Range of Min, Max TUL?	
Parent*	#	Category| Component | Type			MIN UL	TUL	MAX UL			Years	Rate	Years	Rate	Below Min TUL	Above Max TUL
OH	1	Fully Dressed Wood Poles	Overall		35	45	75	1830	Poles, Towers and Fixtures	45	2%	45	2%	No	No
			Cross Arm	Wood	20	40	55	1830	Poles, Towers and Fixtures	45	2%	45	2%	No	No
				Steel	30	70	95	1830	Poles, Towers and Fixtures	45	2%	45	2%	No	No
	2	Fully Dressed Concrete Poles	Overall		50	60	80	1830	Poles, Towers and Fixtures	60	2%	60	2%	No	No
			Cross Arm	Wood	20	40	55	1830	Poles, Towers and Fixtures	40	3%	40	3%	No	No
				Steel	30	70	95	1830	Poles, Towers and Fixtures	60	2%	60	2%	No	No
	3	Fully Dressed Steel Poles	Overall		60	60	80	1830	Poles, Towers and Fixtures	60	2%	60	2%	No	No
			Cross Arm	Wood	20	40	55	1830	Poles, Towers and Fixtures	40	3%	40	3%	No	No
				Steel	30	70	95	1830	Poles, Towers and Fixtures	60	2%	60	2%	No	No
	4	OH Line Switch			30	45	55	1835	Overhead Conductors & Devices	45	2%	45	2%	No	No
	5	OH Line Switch Motor			15	25	25	1835	Overhead Conductors & Devices	25	4%	25	4%	No	No
	6	OH Line Switch RTU			15	20	20	1835	Overhead Conductors & Devices	20	5%	20	5%	No	No
	7	OH Integral Switches			35	45	60	1835	Overhead Conductors & Devices	45	2%	45	2%	No	No
	8	OH Conductors			50	60	75	1835	Overhead Conductors & Devices	60	2%	60	2%	No	No
	9	OH Transformers & Voltage Regulators			30	40	60	1850	Line Transformers	40	3%	40	3%	No	No
	10	OH Shunt Capacitor Banks			25	30	40	N/A							
	11	Reclosers			25	40	55	N/A							
TS & MS	12	Power Transformers	Overall		30	45	60	1850	Line Transformers	40	3%	40	3%	No	No
			Bushing		10	20	30								
			Tap Changer		20	30	60								
	13	Station Service Transformer			30	45	55								
	14	Station Grounding Transformer			30	40	40	1820	Distribution Station Equipment	40	3%	40	3%	No	No
	15	Station DC System	Overall		10	20	30	1820	Distribution Station Equipment	20	5%	20	5%	No	No
			Battery Bank		10	15	15	1820	Distribution Station Equipment	15	7%	15	7%	No	No
			Charger		20	20	30	1820	Distribution Station Equipment	20	5%	20	5%	No	No
	16	Station Metal Clad Switchgear	Overall		30	40	60	1820	Distribution Station Equipment	40	3%	40	3%	No	No
			Removable Breaker		25	40	60								
	17	Station Independent Breakers			35	45	65	1820	Distribution Station Equipment	45	2%	45	2%	No	No
	18	Station Switch			30	50	60	1820	Distribution Station Equipment	50	2%	50	2%	No	No
	19	Electromechanical Relays			25	35	50	1820	Distribution Station Equipment	35	3%	35	3%	No	No
	20	Solid State Relays			10	30	45	1820	Distribution Station Equipment	30	3%	30	3%	No	No
	21	Digital & Numeric Relays			15	20	20	1820	Distribution Station Equipment	20	5%	20	5%	No	No
	22	Rigid Busbars			30	55	60	1820	Distribution Station Equipment	55	2%	55	2%	No	No
	23	Steel Structure			35	50	90	1820	Distribution Station Equipment	50	2%	50	2%	No	No
UG	24	Primary Paper Insulated Lead Covered (PILC) Cables			60	65	75	N/A							
	25	Primary Ethylene-Propylene Rubber (EPR) Cables			20	25	25	1845	Underground Conductors & Devices	25	4%	25	4%	No	No
	26	Primary Non-Tree Retardant (TR) Cross Linked Polyethylene (XLPE) Cables Direct Buried			20	25	30	1845	Underground Conductors & Devices	25	4%	25	4%	No	No
	27	Primary Non-TR XLPE Cables in Duct			20	25	30	1845	Underground Conductors & Devices	25	4%	25	4%	No	No
	30	Secondary PILC Cables			70	75	80								
	31	Secondary Cables Direct Buried			25	35	40	1855	Services	35	3%	35	3%	No	No
	32	Secondary Cables in Duct			35	40	60	1855	Services	40	3%	40	3%	No	No
	33	Network Tranformers	Overall		20	35	50								
			Protector		20	35	40								
	34	Pad-Mounted Transformers			25	40	45	1850	Line Transformers	40	3%	40	3%	No	No
	35	Submersible/Vault Transformers			25	35	45	1850	Line Transformers	35	3%	35	3%	No	No
	36	UG Foundation			35	55	70	1840	Underground Conduit	55	2%	55	2%	No	No
	37	UG Vaults	Overall		40	60	80								
			Roof		20	30	45								
	38	UG Vault Switches			20	35	50	1845	Underground Conductors & Devices	35	3%	35	3%	No	No
	39	Pad-Mounted Switchgear			20	30	45	1845	Underground Conductors & Devices	30	3%	30	3%	No	No
	40	Ducts			30	50	85	1840	Underground Conduit	50	2%	50	2%	No	No
	41	Concrete Encased Duct Banks			35	55	80	1840	Underground Conduit	55	2%	55	2%	No	No
	42	Cable Chambers			50	60	80	1840	Underground Conduit	60	2%	60	2%	No	No
S	43	Remote SCADA			15	20	30								

Table 46 - Table F-2 from Kinectrics Report

#	Asset Details: Category| Component | Type		Useful Life Range		USoA Account Number	USoA Account Description	Current Years	Current Rate	Proposed Years	Proposed Rate	Outside Range of Min, Max TUL? Below Min Range	Outside Range of Min, Max TUL? Above Max Range
1	Office Equipment		5	15	1915	Office Furniture & Equipment	8	13%	8	13%	No	No
2	Vehicles	Trucks & Buckets	5	15	1930	Transportation Equipment	12	8%	12	8%	No	No
		Trailers	5	20	1930	Transportation Equipment	10	10%	10	10%	No	No
		Vans	5	10	1930	Transportation Equipment	5	20%	5	20%	No	No
3	Administrative Buildings		50	75	200/201	Building & Fixtures	60	2%	60	2%	No	No
4	Leasehold Improvements		Lease dependent									
5	Station Buildings	Station Buildings	50	75	1808	Building & Fixtures	60	2%	60	2%	No	No
		Parking	25	30	1808	Building & Fixtures	25	4%	25	4%	No	No
		Fence	25	60	1808	Building & Fixtures	25	4%	25	4%	No	No
		Roof	20	30	1808	Building & Fixtures	25	4%	25	4%	No	No
6	Computer Equipment	Hardware	3	5	1920	Computer Equipment - Hardware	5	20%	5	20%	No	No
		Software	2	5	1925	Computer Equipment - Software	5	20%	5	20%	No	No
7	Equipment	Power Operated	5	10								
		Stores	5	10	1935	Stores Equipment	8	13%	8	13%	No	No
		Tools, Shop, Garage Equipment	5	10	1940	Tools, Shops Garage Equipment	8	13%	8	13%	No	No
		Measurement & Testing Equipment	5	10	1945	Measurement and Testing Equipment	8	13%	8	13%	No	No
8	Communication	Towers	60	70								
		Wireless	2	10	1955	Communication Equipment	10	10%	10	10%	No	No
9	Residential Energy Meters		25	35	1860	Meters - Mechanical	25	4%	25	4%	No	No
10	Industrial/Commercial Energy Meters		25	35	1860	Industrial/Commercial Energy Meters	25	4%	25	4%	No	No
11	Wholesale Energy Meters		15	30	1860	Wholesale Energy Meters	15	7%	15	7%	No	No
12	Current & Potential Transformer (CT & PT)		35	50	1860	Current & Potential Transformer (CT & PT	40	3%	40	3%	No	No
13	Smart Meters		5	15	1860	Smart Meters	15	7%	15	7%	No	No
14	Repeaters - Smart Metering		10	15	1860	Repeaters - Smart Metering	15	7%	15	7%	No	No
15	Data Collectors - Smart Metering		15	20	1860	Data Collectors - Smart Metering	15	7%	15	7%	No	No

2.2.4 CAPITALIZATION POLICY

WNP's capitalization policy has not changed since its last Cost of Service in 2016[17]. Capital assets are recorded at cost in accordance with MIFRS accounting principles as well as guidelines set out by the Ontario Energy Board, where applicable. A copy of WNP's capitalization policy has been included as Appendix 2B.

All expenditures by the Corporation are classified as either capital or operating expenditures. The intention of these classifications is to allocate costs across accounting periods in a manner that appropriately matches those costs with the related current and future economic benefits. The amount to be capitalized is the cost to acquire or construct a capital asset, including any ancillary costs incurred to place a capital asset into its intended state of operation. WNP does not currently capitalize interest on funds used for construction.

WNP's adherence to the capitalization policy can be described as follows;

- ✓ Assets that are intended to be used on an on-going basis and are expected to provide future economic benefit (generally considered to be greater than one year) will be capitalized.
- ✓ General Plant items with an estimated useful life greater than one year and valued at greater than $500 will be capitalized.
- ✓ Expenditures that create a physical betterment or improvement of the asset (i.e. there is a significant increase in the physical output or service capacity, or the useful life of the capital asset is extended) will be capitalized.
- ✓ All vehicles are capitalized.

Indirect overhead costs, such as general and administration costs that are not directly attributable to an asset, are not, nor have they ever been capitalized.

[17] MFR - Changes to capitalization policy since its last rebasing application as a result of the OEB's letter dated July 17, 2012 or for any other reasons, the applicant must identify the changes and the causes of the changes.

2.3 ALLOWANCE FOR WORKING CAPITAL

2.3.1 DERVIATION OF WORKING CAPTIAL

WNP has used the 7.5% Allowance Approach for the purpose of calculating its Allowance for Working Capital. This was done in accordance with the letter issued by the Board on June 03, 2015 for a rate of 7.5% of the sum of Cost of Power and controllable expenses (i.e., Operations, Maintenance, Billing and Collecting, Community Relations, Administration and General). WNP attests that the Cost of Power is determined by the split between RPP and non-RPP customers based on actual data, using the most current RPP price and using current UTR. The table below shows WNP's calculations in determining its Allowance for Working Capital.

Table 47 - Allowance for Working Capital

	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS	MIFRS
Expenses for Working Capital	**Last Board Approved**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Eligible Distribution Expenses:							
3500-Distribution Expenses – Operation	420,000	442,995	444,043	394,084	407,117	430,429	443,000
3550-Distribution Expenses – Maintenance	234,500	218,122	222,539	243,715	214,209	253,402	252,000
3650-Billing and Collecting	361,000	380,741	347,237	351,745	402,260	417,717	415,500
3700-Community Relations	7,000	8,794	6,835	9,833	7,370	5,458	7,500
3800-Administrative and General Expenses	697,500	693,403	697,404	713,859	788,126	790,494	797,000
Property Taxes	14,000	13,493	13,282	12,892	12,560	14,000	14,000
Total Eligible Distribution Expenses	1,736,909	1,760,457	1,734,443	1,729,373	1,834,912	1,914,803	1,932,500
3350-Power Supply Expenses	14,081,514	12,536,742	11,574,763	11,109,584	11,362,446	12,059,931	12,196,563
Total Expenses for Working Capital	15,818,423	14,297,199	13,309,205	12,838,957	13,197,358	13,974,734	14,129,063
Working Capital factor	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%	7.5%
Total Working Capital	**1,186,382**	**1,072,290**	**998,190**	**962,922**	**989,802**	**1,048,105**	**1,059,680**
% change		-9.62%	-6.91%	-3.53%	2.79%	5.89%	1.10%

2.3.2 LEAD LAG STUDY[18]

WNP is not proposing to use a lead lag study in order to determine its Working Capital Allowance and has chosen to follow the Board's June 3, 2015 letter which provided two options for the calculation of the allowance for working capital:[19]

(1) The 7.5% allowance approach; or
(2) The filing of a lead/lag study.

WNP notes that it has not previously been directed by the Board to undertake a lead/lag study.

[18] MFR - Working Capital - 7.5% allowance or Lead/Lag Study or Previous OEB Direction
[19] MFR - Lead/Lag Study - leads and lags measured in days, dollar-weighted

2.3.3 CALCULATION OF COST OF POWER[20]

WNP calculated the cost of power for the 2020 Bridge Year and the 2021 Test Year based on the results of the load forecast discussed in detail in Exhibit 3. The commodity prices used in the calculation were prices published in the Board's "Regulated Price Plan - Price Report November 1, 2019 to October 31, 2020"[21]. Should the Board publish a revised Regulated Price Plan Report prior to the Board's Decision in the application, WNP will update the electricity prices in the forecast.

The sale of energy is a flow through revenue, and the cost of power is a flow through expense. Energy sales and the cost of power expense are presented in the table below. WNP records no profit or loss resulting from the flow through energy revenues and expenses. Any temporary variances are included in the RSVA account balances.

The components of WNP's cost of power are summarized in several tables illustrated over the following pages:

Table 48 – Summary of Cost of Power – 2021 Test Year

Cost of Power	**Total $**
Commodity	$6,317,521
Class A & Class B non-RPP Global Adjustment	$5,719,728
Transmission Network	$659,186
Transmission Connection	$539,323
Wholesale Market Service	$317,206
Class A Capacity Based Recovery	$11,765
Class B Capacity Based Recovery	$22,167
Rural Rate Protection	$52,868
Low Voltage	$368,287
Smart Meter Entity Charge	$25,974
Ontario. Electricity Rebate (31.8%)	($1,837,456)
TOTAL	**$12,196,568**

[20] MFR - Cost of Power must be determined by split between RPP and non-RPP customers based on actual data, use most current RPP (TOU) price, use current UTR. Should include SME charge.
[21] "Regulated Price Plan - Price Report November 1, 2019 to October 31, 2020" issued October 22, 2019

Table 49 – Forecasted Commodity Prices[22][23][24][25]

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**

The Commodity share of the Cost of Power is calculated in the same manner as has been previously approved by the OEB in WNP's previous Cost of Service application as well as other applications. The utility used the commodity prices as published in the Board's "Regulated Price Plan - Price Report November 1, 2019 to October 31, 2020".

WNP appreciates 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.

The table below summarizes the commodity expenses based on WNP's 2021 forecasted kWh and kW quantities, as derived from the LDC's Load Forecast, split by RPP and non-RPP:

Table 50 – Commodity Expenses

Commodity					2021 Test Year					
Customer		**Revenue**	**Expense**							
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			899,639	27,214,066	$ 0.02009	$ 0.12803	$3,502,291
General Service <50kW	kWh	4010	4705			2,406,032	9,745,646	$ 0.02009	$ 0.12803	$1,296,072
General Service 50-999kW	kWh	4035	4705	4,953,670		13,015,570	1,864,358	$ 0.02009	$ 0.12803	$599,696
General Service 1000-4999kW	kWh	4010	4705	45,366,330		-	-	$ 0.02009	$ 0.12803	$911,410
Unmetered Scattered Load	kWh	4025	4705			1,041	5,630	$ 0.02009	$ 0.12803	$742
Sentinel Lighting	kWh	4025	4705			2,400	18,469	$ 0.02009	$ 0.12803	$2,413
Street Lights	kWh	4025	4705			243,800	-	$ 0.02009	$ 0.12803	$4,898
TOTAL										**$6,317,521**

[22] MFR - Cost of Power must be determined by split between RPP and non-RPP Class A and Class B customers based on actual data, use most current RPP (TOU) price, use current UTR. Calculation must fully consider all other impacts resulting from the Ontario Fair Hydro Plan Act, 2017. Distributors must complete Appendix 2-ZA - Commodity Expense.

[23] MFR - In consideration of the impact of the Fair Hydro Plan, actual data must be split between Class A and Class B customers (RPP and non-RPP).

[24] MFR – N/A For customer classes that include Class A customers, distributor must incorporate Class A GA cost by completing the relevant section in Appendix 2-Z

[25] MFR – N/A If a distributor expects test year consumption data to vary significantly, a distributor may provide a forecast of the expected split between Class A and Class B and the expected split between RPP, non-RPP eligible for modifier and non-RPP non eligible for modifier consumption data and provide brief explanation of the forecast

Global Adjustment

The table below summarizes the approximate Global Adjustment expenses for both Class A and Class B non-Regulated Price Plan (RPP) customers:

Table 51 – Class A and Class B non-RPP Global Adjustment

Class A - non-RPP Global Adjustment					2021 Test Year			
Customer		Revenue	Expense		kWh Volume		GA/kWh ***	Amount
General Service 50-999kW		4035	4707		4,953,670		$ 0.0785	$388,644
General Service 1000-4999kW		4010	4707		45,366,330		$ 0.0785	$3,559,251
		4010	4707					
					50,320,000			$3,947,895

Class B - non-RPP Global Adjustment						2021 Test Year				
Customer		Revenue	Expense							Amount
Class Name	UoM	USA #	USA #			Class B Non-RPP Volume			GA Rate/kWh	
Residential	kWh	4006	4707			899,639			$ 0.10694	$96,207
General Service <50kW	kWh	4010	4707			2,406,032			$ 0.10694	$257,301
General Service 50-999kW	kWh	4035	4707			13,015,570			$ 0.10694	$1,391,885
General Service 1000-4999kW	kWh	4010	4707			0			$ 0.10694	$0
Unmetered Scattered Load	kWh	4025	4707			1,041			$ 0.10694	$111
Sentinel Lighting	kWh	4025	4707			2,400			$ 0.10694	$257
Street Lights	kWh	4025	4707			243,800			$ 0.10694	$26,072
	kWh	4025	4707			0			$ 0.10694	$0
Total Volume						**16,568,482**				
TOTAL										**$1,771,833**

** The GA rate is based on the average GA rate per kWh billed to Class A customers for 2019*

WNP has 6 customers who are billed and settled as Class A customers. These customers opted into the IESO's Industrial Conservation Initiative (ICI), participating in the 2019-2020 program and enrolled in the "2020-2021" program. The kWh volume under "Class A – non-RPP Global Adjustment) in the above table represents the forecasted load for Test Year (2021) for these 6 customers who are participating in the ICI program.

Transmission Network and Connection Charges

Electricity distributors are charged for transmission costs at the wholesale level and subsequently pass these charges on to their distribution customers through the Retail Transmission Service Rates (RTSRs). For each distribution rate class there are two RTSRs:

- RTSR Network charge - recovers the Uniform Transmission Rates (UTR) wholesale network service charge
- RTSR Connection charge - recovers the UTR wholesale line and transformation connection charges.

WNP pays Network and Connection charges from Hydro One. WNP is fully embedded to Hydro One. Below are the proposed Transmission Network and Connection rates as calculated using the OEB's 2021 RTSR workform which has been filed as part of this Application:

Table 52 - Transmission Network and Connection Proposed Rates

Rate Class	Unit	Current RTSR – Network	Proposed RTSR - Network	Change	
Residential	kWh	$0.0068	$0.0067	($0.0001)	-1%
General Service <50kW	kW	$0.0063	$0.0062	($0.0001)	-1%
General Service 50 - 999kW	kW	$2.6330	$2.6024	($0.0306)	-1%
General Service 1000 - 4999kW	kW	$2.7966	$2.7641	($0.0325)	-1%
Unmetered Scattered Load	kWh	$0.0063	$0.0062	($0.0001)	-1%
Sentinel Lighting	kW	$1.9957	$1.9724	($0.0233)	-1%
Streetlights	kW	$1.9856	$1.9625	($0.0231)	-1%

Rate Class	Unit	Current RTSR – Connection	Proposed RTSR - Connection	Change	
Residential	kWh	$0.0057	$0.0060	$0.0003	5%
General Service <50kW	kW	$0.0047	$0.0049	$0.0002	5%
General Service 50 - 999kW	kW	$1.9271	$2.0154	$0.0883	5%
General Service 1000 - 4999kW	kW	$2.1128	$2.2096	$0.0968	5%
Unmetered Scattered Load	kWh	$0.0047	$0.0049	$0.0002	5%
Sentinel Lighting	kW	$1.5210	$1.5907	$0.0697	5%
Streetlights	kW	$1.4901	$1.5584	$0.0683	5%

The table below summarizes the projected transmission network and connection expenses, applying the proposed rates to the 2021 load forecast kWh and kW volumes:

Table 53 - Transmission Network and Connection Expenses

		2021 Test Year	**RPP**		**2021 Test Year**	**non-RPP**		**Total**
Transmission - Network								
Class per Load Forecast	**Units**	Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh	27,214,066	0.0067	182,902	899,639	0.0067	6,046	
General Service <50kW	kWh	9,745,646	0.0062	60,683	2,406,032	0.0062	14,982	
General Service 50-999kW	kW	4,928	2.6024	12,824	47,497	2.6024	123,604	
General Service 1000-4999kW	kW	-	2.7641	-	92,890	2.7641	256,753	
Unmetered Scattered Load	kWh	5,630	0.0062	35	1,041	0.0062	6	
Sentinel Lighting	kW	48	1.9724	96	6	1.9724	12	
Street Lights	kW	-	1.9625	-	632	1.9625	1,241	
SUB-TOTAL				256,541			402,645	659,186
Transmission - Connection								
Class per Load Forecast	**Units**	Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh	27,214,066	0.0060	162,225	899,639	0.0060	5,363	
General Service <50kW	kWh	9,745,646	0.0049	47,902	2,406,032	0.0049	11,826	
General Service 50-999kW	kW	4,928	2.0154	9,932	47,497	2.0154	95,723	
General Service 1000-4999kW	kW	-	2.2096	-	92,890	2.2096	205,246	
Unmetered Scattered Load	kWh	5,630	0.0049	28	1,041	0.0049	5	
Sentinel Lighting	kW	48	1.5907	77	6	1.5907	10	
Street Lights	kW	-	1.5584	-	632	1.5584	986	
SUB-TOTAL				220,164			319,160	539,323

The transmission network charges, included in the Cost of Power for the Test Year 2021, are projected at $659,186 and the connection charges are projected at $539,323. The Rates are applied to the 2021 Load Forecast to determine the amount to be included in the Cost of Power.

Wholesale Market Service Charges & Capacity Based Recovery Charges

On December 17, 2019, the OEB released Decision and Order for the Wholesale Market Service (WMS) effective January 1, 2020. The Board's decision is summarized as follows:

- The WMS rate used by rate-regulated distributors to bill their customers shall be $0.0030 per kilowatt-hour, effective January 1, 2020.
- For Class B customers, a Capacity based Recovery (CBR) component of $0.0004 per kilowatt-hour shall be added to the WMS rate for a total of $0.0034 per kilowatt-hour.
- For Class A customers, distributors shall bill the actual CBR costs to Class A customers in proportion to their contribution to peak.

In compliance with this order, WNP has applied the Board-approved rate $0.0034/kWh to its' 2021 Load Forecast to include $317,206 for WMS, $11,765 for Class A CBR and $22,167 in Class B CBR in its' Cost of Power projections as illustrated in the table below:

Table 54- Wholesale Market and CBR

		2021 Test Year	RPP		2021 Test Year	non-RPP		Total
Wholesale Market Service **Class per Load Forecast**	**Units**	Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh	27,214,066	0.0030	81,642	899,639	0.0030	2,699	
General Service <50kW	kWh	9,745,646	0.0030	29,237	2,406,032	0.0030	7,218	
General Service 50-999kW	kWh	1,864,358	0.0030	5,593	17,969,240	0.0030	53,908	
General Service 1000-4999kW	kWh	-	0.0030	-	45,365,064	0.0030	136,095	
Unmetered Scattered Load	kWh	5,630	0.0030	17	1,041	0.0030	3	
Sentinel Lighting	kWh	18,469	0.0030	55	2,400	0.0030	7	
Street Lights	kWh	-	0.0030	-	243,800	0.0030	731	
SUB-TOTAL				116,545			200,662	317,206
Class A CBR **Class per Load Forecast**	**Units**	Volume	Rate	$	Volume	Rate	$	Total
Residential				-			-	
General Service <50kW				-			-	
General Service 50-999kW				-	4,953,670	0.0002	1,158	
General Service 1000-4999kW				-	45,366,330	0.0002	10,606	
Unmetered Scattered Load				-			-	
Sentinel Lighting				-			-	
Street Lights				-			-	
SUB-TOTAL				-			11,765	11,765
Class B CBR **Class per Load Forecast**	**Units**	Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh	27,214,066	0.0004	10,886	899,639	0.0004	360	
General Service <50kW	kWh	9,745,646	0.0004	3,898	2,406,032	0.0004	962	
General Service 50-999kW	kWh	1,864,358	0.0004	746	13,015,570	0.0004	5,206	
General Service 1000-4999kW	kWh	-	0.0004	-	-	0.0004	-	
Unmetered Scattered Load	kWh	5,630	0.0004	2	1,041	0.0004	0	
Sentinel Lighting	kWh	18,469	0.0004	7	2,400	0.0004	1	
Street Lights	kWh	-	0.0004	-	243,800	0.0004	98	
SUB-TOTAL				15,539			6,627	22,167

Rural or Remote Electricity Protection Rate (RRRP) Charges

On December 17, 2019, the OEB released Decision and Order for the Rural or Remote Electricity Protection Rate (RRRP) effective January 1, 2020. The Board's decision is summarized as:

- The RRRP rate used by rate-regulated distributors to bill their customers shall be $0.0005 per kilowatt-hour, effective January 1, 2020.

In compliance with this order, WNP has applied the Board Approved $0.0005/kWh to its' 2021 Load Forecast to include $52,868 in its' Cost of Power as illustrated in the table below:

Table 55 – Rural or Remote Electricity Rate Protection

		2021 Test Year	RPP		2021 Test Year	non-RPP		Total
RRRP **Class per Load Forecast**	**Units**	Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh	27,214,066	0.0005	13,607	899,639	0.0005	450	
General Service <50kW	kWh	9,745,646	0.0005	4,873	2,406,032	0.0005	1,203	
General Service 50-999kW	kWh	1,864,358	0.0005	932	17,969,240	0.0005	8,985	
General Service 1000-4999kW	kWh	-	0.0005	-	45,365,064	0.0005	22,683	
Unmetered Scattered Load	kWh	5,630	0.0005	3	1,041	0.0005	1	
Sentinel Lighting	kWh	18,469	0.0005	9	2,400	0.0005	1	
Street Lights	kWh	-	0.0005	-	243,800	0.0005	122	
SUB-TOTAL				19,424			33,444	52,868

Smart Meter Charge

On March 1, 2018, the Ontario Energy Board (OEB) approved the application by the Independent Electricity System Operator (IESO), in its' capacity as the Smart Metering Entity (SME), for a smart metering charge (SMC) for the 2018-2022 period, for a new SMC of $0.57 per smart meter (Residential and General Service <50 kW) per month. The proposed rate remains at $0.57 in accordance with the OEB guidance provided on March 23, 2018.[26].

In compliance with this order, WNP has applied the Board Approved rate of $0.57 per month for the forecasted Residential and General Service<50kW customers for Test Year 2021 and included the projected amount of $25,974 in its' Cost of Power as illustrated below:

Table 56 - Smart Meter Entity

		2021 Test Year	RPP	
Smart Meter Entity Charge **Class per Load Forecast**	**Units**	Customers	Rate	$
Residential		3,328	0.57	22,766
General Service <50kW		469	0.57	3,208
				-
SUB-TOTAL				25,974

[26] MFR - Distributor must follow accounting guidance provided on March 23, 2018

Low Voltage Charges:

WNP incurs low voltage (LV) charges from Hydro One as the LDC is embedded to Hydro One. In Exhibit 8, WNP proposes Low Voltage Service Rates with detailed calculations being presented in the Exhibit. In summary:

- The 2021 Test Year LV rate projections were allocated to customer classes, according to each class' share of projected Transmission-Connection revenue, in accordance with Board policy;
- The 2021 Test Year LV charges were calculated based on the actuals of 2019.

WNP has estimated the Low Voltage charge for the 2016 Test Year to be $368,332 as illustrated in the table below:

Table 57 – Low Voltage Charges

		2021 Test Year	RPP		2021 Test Year	non-RPP		Total
Low Voltage - No TLF adjustment **Class per Load Forecast**	**Units**	Volume	Rate	$	Volume	Rate	$	Total
Residential	kWh	25,655,001	0.0043	110316.5	848,099	0.0043	3646.827	
General Service <50kW	kWh	9,187,329	0.0036	33074.383	2,268,193	0.0036	8165.496	
General Service 50-999kW	kW	4,928	1.3764	6782.801	47,497	1.3764	65374.66	
General Service 1000-4999kW	kW	-	1.5090	0	92,890	1.5090	140170.6	
Unmetered Scattered Load	kWh	5,307	0.0036	19.105459	981	0.0036	3.531341	
Sentinel Lighting	kW	48	1.0863	52.638839	6	1.0863	6.840075	
Street Lights	kW	-	1.0643	0	632	1.0643	673.1399	
							0	
SUB-TOTAL				150,245			218,041	368,287

2.4 SMART METER DEPLOYMENT & STRANDED

2.4.1 DISPOSITION OF SMART METERS AND TREATMENT OF STRANDED METERS

WNP's disposition and treatment of smart meter related costs were addressed and approved as part of its 2012 Cost of Service Application (EB-2011-0249). Stranded meter balances were disposed of in the 2016 Cost Of Service Application (EB-2015-0110). Therefore, the utility is not seeking any further resolution on this matter.[27]

On the topic of Smart Meters, the utility notes that it has not realized any cost efficiencies since its last Cost of Service in 2016 related to the utility's use of Smart Meter. [28]

[27] MFR - Stranded Meters - if the recovery of stranded conventional meters replaced by smart meters has not been reviewed and approved, a proposal for a Stranded Meter Rate Rider must be made
Explanation for approaches that are not the OEB approach
[28] MFR - Discussion outlining capital and operating efficiencies realized as a result of the deployment and operationalization of smart meters and related technologies (e.g., AMI communications networks, ODS) in its networks. Qualitative and quantitative description and support should be provided as applicable

2.5 CAPITAL EXPENDITURES

2.5.1 PLANNING

WNP's distribution system strategy is the set of policies, rules, guidelines and objectives that the LDC utilizes to transition its current system into its desired future system. The strategy, as described in this Distribution System Plan provides the rationale for the capital expenditures and supporting activities planned for the investment period of 2021-2025.

In advance of the Cost of Service application, WNP retained the services of Kinectrics Inc., an independent power sector consulting firm, to perform an Asset Condition Assessment (ACA) of the fixed assets employed on WNP's distribution system. This study has assisted the LDC in reaffirming its asset replacement methodology and processes as well as identifying data gaps.

The ACA report evaluates the risk of an assets' failure in service by taking into account all available information, including age, operating conditions, results of visual inspections and non-destructive testing and identifies the assets in poor condition that present unacceptably high risk of failure in service.

The ACA report is included as an Appendix in WNP's 2020 Distribution System Plan which has been filed as a separate document as Appendix 2A.

WNP has relied on Kinectrics who in turn used the OEB's filing requirements Chapter 5 to guide its presentation of its policies, practices, and decision-making processes.

2.5.2 DISTRIBUTION SYSTEM PLAN

WNP has filed its' 2020 Distribution System Plan as a separate document as Appendix 2A.[29]

[29] MFR - DSP filed as a stand-alone document; a discrete element within Exhibit 2

2.5.3 CAPITALIZATION OF OVERHEAD

Indirect overhead costs, such as general and administration costs that are not directly attributable to an asset, are not, nor have they ever been capitalized and therefore, Appendix 2-D is not applicable in this application.[30] [31]

2.5.4 COSTS OF ELIGIBLE INVESTMENTS FOR DISTRIBUTORS

WNP attests that it has not included any costs or included any Investments to Connect Qualifying Generation Facilities in its' capital costs or in its Distribution System Plan.

As such, details of any capital contributions made or forecast to be made to a transmitter with respect to a Connection and Cost Recovery Agreement are not applicable in this case.[32]

WNP is not considering incremental conservation initiatives in order to defer or avoid future infrastructure projects as part of distribution system planning processes [33] nor is it planning on applying for funding through distribution rates to pursue activities such as energy efficiency programs, demand response programs, energy storage programs, etc. [34] Lastly, WNP is not considered a generation facility. [35]

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[30] MFR - Appendix 2-D complete; identification of burden rates and burden rates prior to changes, if any

[31] MFR - Changes to capitalization policy since its last rebasing application as a result of the OEB's letter dated July 17, 2012 or for any other reasons, the applicant must identify the changes and the causes of the changes.

[32] MFR - If applicable, details of any capital contributions made or forecast to be made to a transmitter with respect to a Connection and Cost Recovery Agreement. Details to be provided include, initial forecast used to calculate contribution, amount of contribution (if any), true-up dates and potential true-up payments

[33] MFR - Description of how incremental conservation initiatives have been considered in order to defer or avoid future infrastructure projects as part of distribution system planning processes

[34] MFR - If applying for funding through distribution rates to pursue activities such as energy efficiency programs, demand response programs, energy storage programs etc. the application must include a consideration of the projected affects to the distribution system on a long term basis and the projected expenditures. Distributors should explain the proposed program in the context of the distributors five year Distribution System Plan or explain any changes to its system plans that are pertinent to the program

[35] MFR - Generation Facilities - If applicable, proposal to divide the costs of eligible investments between the distributor's ratepayers and all Ontario ratepayers per O.Reg. 330/09:
- Appendices 2-FA through 2-FC identifying all eligible investments for recovery

2.5.5 NEW POLICY OPTIONS FOR THE FUNDING OF CAPITAL

WNP is not proposing any special or different approach to funding its capital expenditure[36] in this rate application (i.e. the utility is not seeking an Advanced Capital Module – ACM)

[36] MFR - Distributor may propose ACM capital project coming into service during Price Cap IR (a discrete project documented in DSP). Provide cost and materiality calculations to demonstrate ACM qualification

2.5.6 ADDITION OF ACM ASSETS TO RATE BASE

In its' 2016 Cost of Service Application (EB-2015-0110), WNP requested and received approval for an Advanced Capital Module (ACM) for the rebuild of its' aged and deteriorated municipal substation (MS3) in 2018.[37] The application was supported by evidence in WNP's 2015 Distribution System Plan. In its' 2018 IRM application for approval of May 1, 2018 distribution rates, (EB-2017-0082), WNP requested and received OEB-approval for ACM rate riders to recover the 2018 capital expenditure to replace the MS3 substation[38]. WNP completed the construction work and energized the new MS3 substation in 2018.

The actual cost for the project was less than one half of one percent under budget. The following table itemizes the difference between budgeted and actual values for costs and ACM calculations.[39]

Table 58 – MS3 Substation ACM vs Actual

	ACM	Project Actual Values
MS3 Project Cost	$1,700,000	$1,692,893
Annual Amortization	$40,400	$38,958
Incremental Revenue Requirement	$108,239	$106,629

As would be expected, the revenue generated from the rate rider is also very close to the required amounts.[40]

Table 59 – ACM Rev. Requirement vs Actual

	Incr. Rev. Requirement	RR Actual Revenue	Difference
2018 Rate Year	$106,629	$106,570	$59
2019 Rate Year	$106,629	$105,881	$748
2020 (May 1 – Aug 31)	$35,543	$35,122	$421

[37] Decision and Rate Order EB-2015-0110 (March 31, 2016) section 3.1.1 Advanced Capital Module, pages 5 to 6
[38] Decision and Rate Order EB-2017-0082 (March 22, 2018) section 8 Advanced Capital Module, pages 8 to 9
[39] MFR - Distributor with previously approved ICM(s) - schedule of ICM amounts, variances and explanation
[40] Balances in Account 1508 sub-accounts, reconciliation with proposed rate base amounts; recalculated revenue requirement should be compared with rate rider revenue

Given the small annual debit balances of this difference, WNP proposes that no action be taken in disposing of this variance and the ACM assets and amortization be added to the rate base balances as of Jan 1, 2021. Once this is complete and the new rates are implemented May 1, 2021, this will terminate the collection of the ACM rate riders as instructed in the Decision and Order for EB-2017-0082.

At the time of preparing this Application, WNP is not forecasting the need for a new Advanced Capital Module or Incremental Capital Module.[41] [42]

[41] MFR - Distributor must establish need for and prudence of these projects based on DSP information; identification that distributor is proposing ACM treatment for these future projects, preliminary cost information
[42] MFR - Complete Capital Module Applicable to ACM and ICM

2.6 SERVICE QUALITY AND RELIABILITY PERFORMANCE[43]

WNP records and reports annually the following Service Reliability Indices:

- SAIDI = Total Customer-Hours of Interruptions/Total Customers Served
- SAIFI = Total Customer Interruptions/Total Customers Served

These indices provide WNP with annual measures of its' service performance that are used for internal benchmarking purposes when making comparisons with other distribution companies (e.g., to better understand the rankings that will support the OEB's Incentive Rate Making Mechanism and Performance Based Regulation). They are reported in accordance with Section 7.3.2 of the OEB's Electricity Distribution Rate Handbook.

WNP's performance metrics are discussed in detail in Exhibit 1, in the Business Plan and in the Applicant's 2020 Distribution System Plan.[44]

WNP is not proposing any additional benchmarking metrics that are not already in place.[45]

[43] MFR - 5 historical years of ESQRs, explanation for any under-performance vs standard and actions taken
[44] MFR - 5 historical years of SAIDI and SAIFI - for all interruptions, all interruptions excluding loss of supply, and all interruptions excluding major events; explanation for any under-performance vs 5 year average and actions taken
[45] MFR - Explanation for any under-performance vs 5 year average and actions taken

Table 60 – OEB App 2-G ESQR Results [46] [47]

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%	n/a	n/a	n/a	n/a	n/a
Telephone Accessibility	65.0%	100.0%	99.9%	99.7%	99.0%	99.0%
Appointments Met	90.0%	95.6%	99.0%	99.4%	99.1%	98.1%
Written Response to Enquires	80.0%	100.0%	100.0%	100.0%	97.0%	97.4%
Emergency Urban Response	80.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Emergency Rural Response	80.0%	n/a	n/a	n/a	n/a	n/a
Telephone Call Abandon Rate	10.0%	0.00%	0.00%	0.00%	0.00%	0.04%
Appointment Scheduling	90.0%	98.6%	99.7%	100.0%	99.5%	99.4%
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%

* WNP does not have any High Voltage connections.

** WNP is an urban distributor and does not respond to rural emergencies.

No explanations are required as all Service Quality Indicators have been met or exceeded by WNP over the 5-year period of 2015 to 2019 inclusive.

Table 61 – OEB App 2-G SAIFI & SAIDI Results

Index	Includes All Outages					Loss of Supply Adjusted					Excludes outages caused by Loss of Supply and Major Events				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
SAIDI	9.310	5.050	3.790	10.030	0.840	0.060	0.690	0.100	4.320	0.840	0.060	0.340	0.100	0.160	0.240
SAIFI	4.760	3.010	4.040	4.510	2.040	0.060	0.280	0.160	3.090	2.040	0.060	0.200	0.160	0.330	0.200
	5 Year Historical Average														
SAIDI					5.804					1.202					0.180
SAIFI					3.672					1.126					0.190

The Applicant confirms that the data represented above is consistent with RRR filings and WNP's annual 2019 Scorecard.[48]

[46] MFR - Distributors may propose SAIDI and SAIFI benchmarks different than 5 year average; provide rationale
[47] MFR - Completed Appendix 2-G
[48] MFR – An applicant must confirm that data are consistent with the scorecard or must explain any inconsistencies

APPENDIX

LIST OF APPENDICES

Appendix 2A	2020 Distribution System Plan
Appendix 2B	Capitalization Policy

APPENDIX 2A – DISTRIBUTION SYSTEM PLAN

www.wellingtonnorthpower.com
ESA# 7012854

Wellington North Power Inc.

Distribution System Plan

August 2020

Prepared by:	**Wellington North Power Inc.**
Third Party Review by:	**Kinectrics Inc.**

Contents

5.2 Distribution System Plan

This report is filed in accordance with the Ontario Energy Board's (OEB) *"Chapter 5 - Consolidated Distribution System Plan"* [1], issued May 14th 2020, (the "Filing Requirements").

Wellington North Power Inc. (WNP) has organized this report using the section and sub-section headings from the OEB's "*Chapter 5 - Consolidated Distribution System Plan"*. The sections of this report are:

Section	Sub-Section	Details
5.2:		**The Distribution System Plan.**
	5.2.1	Distribution System Plan Overview.
	5.2.2	Coordinated Planning with Third Parties.
	5.2.3	Performance Measurement for Continuous Improvement.
	5.2.4	Realized Efficiencies due to Smart Meters.
5.3:		**Asset Management Process.**
	5.3.1	Asset Management Process Overview.
	5.3.2	Overview of Assets Managed.
	5.3.3	Asset Lifecycle Optimization Policies & Practices.
	5.3.4	System Capability Assessment for Renewable Energy Generation.
5.4:		**Capital Expenditure Plan.**
	5.4.1	Capital Expenditure Planning Process Overview.
	5.4.1.1	Rate-Funded Activities to Defer Distribution Infrastructure.
	5.4.2	Capital Expenditure Summary.
	5.4.3	Justifying Capital Expenditures.
	5.4.3.1	Overall Plan.
	5.4.3.2	Material Investments.

[1] "Filing Requirements for Electricity Distribution Rate Applications – 2020 Edition for 2021 Rate Applications: Chapter 5, Consolidated Distribution System Plan" (May 14, 2020)

5.2.1 Distribution System Plan Overview

Introduction

Wellington North Power Inc. is a distribution company providing safe, reliable electricity to consumers in the urban areas of Mount Forest, Arthur and Holstein. Our mission statement is:

> *"Wellington North Power Inc. (WNP) shall provide its customers with the most cost effective delivery of electricity safely, reliably and efficiently. This will be done while providing superior customer service and promoting customer education and green initiatives within its service area."*

The purpose of Wellington North Power Inc.'s Distribution System Plan (DSP) is to have a paced and prioritized investment plan that balances the requirements of customers versus the needs of the utility considering the electricity demands for today and for the future. This DSP compliments our company's mission statement.

WNP's 2020 DSP plan includes:

- A forecast of the utility's capital investments for the period of 2021 to 2025 inclusive.
- A review of the utility's performance based upon historic data and information for the period of 2015 to 2020.
- Feedback from WNP's 2015 DSP as received from intervening parties during the utility's 2016 Cost of Service application process. Of significance, in WNP's 2020 DSP has:
  - i. Conducted surveys to ratify customers' needs and expectations from their local hydro company. The surveys included feedback from customers about what WNP's capital investment priorities should be.
  - ii. Retained a third-party, Kinectrics Inc. to conduct an Asset Condition Assessment study of the utility's distribution assets. This study has assisted WNP in reaffirming its' asset replacement methodology and processes as well as identifying data gaps.
  - iii. Pole testing equipment – WNP purchased a Polux Pole tester to gather data about the structural integrity of poles to assist with decision-making about pole-replacements.
  - iv. Continue with the utility's routine maintenance and inspection of assets and equipment.
  - v. Detailed Information Technology and Information Systems plans to support WNP in maintaining control of data and privacy as well as meeting the requirements of the OEB's cyber-security framework.
- A capital investment program for the period 2021 to 2025 with focus on:
  - i. Customer preferences and priorities;
  - ii. Effective and timely asset replacement planning; and
  - iii. Tackling new challenges that did not exist in WNP's 2015 DSP, such as cyber-security and privacy requirements.

5.2.1a Key Elements of DSP

Purpose: High level overview of the key elements of WNP's DSP that affect its' rate proposal, especially prospective business conditions driving the size and mix of capital investments needed to achieve planning objectives.

In WNP's first DSP (2015) representing the forecast period of 2016 to 2020, the capital plan included two "special" projects that represented a significant investment for the utility. These "special" projects were:

i) 2016: A 2nd line 44kV feeder to the Town of Mount Forest to address capacity concerns; and
ii) 2018: Replacement of an aged and deteriorating municipal substation (MS2).

These projects were completed and in-service on time, within budget and represented a significant investment by WNP that greatly influenced the rate proposal of the utility in its' 2016 Cost of Service rate application (EB-2015-0110).

In WNP's second DSP (2020) representing the forecast period of 2021 to 2025, the capital plan does not necessitate the inclusion or need for any "special" projects. Consequently, the proposed capital plan is approx. $3,000,000 lower with a 5-year investment total of $3,296,805 as illustrated below:

Figure 1: Planned Capital Investment: DSP 2015 versus DSP 2020

Previous Capital Expenditure Plan - 2016-2020							
Category	**2016**	**2017**	**2018**	**2019**	**2020**	**Total**	**Yearly Avg**
System Access	$55,000	$240,000	$240,000	$240,000	$60,000	$835,001	$167,000
System Renewal	$90,000	$390,000	$1,932,000	$290,000	$450,000	$3,152,002	$630,400
System Service	$1,373,217	$0	$0	$0	$0	$1,373,218	$274,644
General Plant	$75,694	$138,670	$24,470	$421,850	$453,000	$1,113,685	$222,737
Total	**$1,593,911**	**$768,670**	**$2,196,470**	**$951,850**	**$963,000**	**$6,473,906**	$1,294,781
Capital Expenditure Plan - 2021-2025							
Category	**2021**	**2022**	**2023**	**2024**	**2025**	**Total**	**Yearly Avg**
System Access	$70,000	$70,000	$70,000	$70,000	$85,000	$365,001	$73,000
System Renewal	$340,000	$265,000	$265,000	$315,000	$315,000	$1,500,002	$300,000
System Service	$26,500	$18,500	$21,000	$81,500	$14,000	$161,500	$32,300
General Plant	$190,500	$598,050	$151,450	$150,800	$179,500	$1,270,302	$254,060
Total	**$627,000**	**$951,550**	**$507,450**	**$617,300**	**$593,500**	**$3,296,805**	**$659,361**

As a result of a lower capital plan, this will help alleviate bill impact increases to WNP's rate-payers in the utility's rate proposal as filed in its' Cost of Service application for May 2021 rates (EB-2020-0061).

System Access:

For proposed investments under the System Access category, the key drivers in the case of WNP include:

- Customer service requests for new customer connections.
- Customer requests for modifications or amendments from the local distribution company's (LDC) distribution equipment up to the entry point of the property.
- Customer requests for load expansion at existing commercial and industrial customers.
- Third party infrastructure developments requiring system plant relocates; and
- Mandated service obligations, such as revenue metering.

All residential and small business (General Service <50kW) customers have been equipped with smart meters. WNP completed sampling for meter resealing and re-verification in 2017, 2018 and 2019. The LDC is planning to replace smart meters commencing in 2025 when meters will have reached their 15 year useful asset life.

System Renewal:

WNP retained the services of Kinectrics Inc., an independent power sector consulting firm, to perform an Asset Condition Assessment (ACA) of the fixed assets employed on WNP's distribution system. The report prepared by Kinectrics Inc. is attached in Appendix B. The ACA report evaluates the risk of assets' failure in service by taking into account all available information, including age, operating conditions, results of visual inspections and non-destructive testing and identifies the assets in poor condition that present unacceptably high risk of failure in service.

Distribution system renewal projects during the next five years also include renewal of high risk assets on both the overhead and underground distribution system. By taking into account the results of testing, patrols and service age, assets which are in poor condition are identified and included in this distribution plan for renewal.

WNP has not had extensive failure issues with the overhead pole mounted distribution transformers. Like most distribution utilities, WNP manages this asset category using a reactive replacement strategy, i.e. replacement of transformers upon failure, unless inspections identify transformers that present safety risks. In the case of pad mounted transformers, WNP plans to replace any that are considered a live front transformer which is considered a risk to worker safety. This is a relatively small population typically found in neighbourhoods built in the 1960s.

The ACA found no issues with the substation transformers and none are scheduled for replacement during this distribution plan period of 2021-2025. The LDC will continue to monitor the substation transformers with routine maintenance and inspection activities.

System Service:
Projects in the System Service category are driven by the need to alleviate capacity constraints due to load growth. The projects in this category also include capital investments aimed at improving system operations, reliability and efficiencies through voltage upgrades, distribution automation and intelligent devices or equipment, all aimed at enhancing customer value and operational effectiveness.

During the next five years, no capacity constraints are anticipated on the distribution system. WNP's smart grid development initiative, involving equipping all the distribution stations with automated feeder reclosers and supervisory control and data acquisition (SCADA) system, has been started. Two of the stations are now equipped with automated and remote controlled reclosers, protected through SEL relays, allowing all features of the SCADA system to be fully utilized. The Smart grid development initiative also includes upgrade and renewal of revenue meters to comply with regulations.

General Plant:
The capital investments under this category include investments into vehicle fleet, equipment and tools, buildings and facilities, computer hardware, software systems and system supervisory equipment. These investments are driven by the objectives to improve employee safety, maintain worker productivity and operating efficiency as well as maintain data privacy and aspire to the requirements of the OEB's cyber-security framework.

5.2.1b Overview of Customers' Preferences and Expectations

Purpose: An overview of how projects or initiatives address customers' preferences and expectations.

As described in section "5.2.2 Coordinated Planning with Third Parties", in preparing its' 2020 DSP, WNP conducted surveys with Residential, Small Business and Industrial & Commercial customers in 2019. Included in the survey was a question concerning investment priorities to help WNP ensure that our planning process for capital and maintenance work is in line with customer expectations. WNP has incorporated these priorities in to its' planning process and specific project needs. Below are direct links to illustrate how WNP's DSP addresses these customer priorities:

- **Priority #1) Maintain and Upgrade Equipment:**
  - ✓ WNP's current fixed asset preventative maintenance program is in-line with best utility practice as validated by Kinectrics' Asset Condition Assessment.
- **Priority #2) Reduce Time Needed to Restore Power:**
  - ✓ In 2014 and 2018, WNP replaced 2 substations and incorporated new technology including SCADA and installing automated reclosers on the feeders to reduce outage times and improve safety. WNP's future preventative maintenance plans include proactively inspecting these reclosers and other integral station components to ensure their performance.
- **Priority #3) Having an on-line Outage Map:**
  - ✓ The utility will start exploring what "outage map" solutions exist and whether there are other alternatives (e.g. SMS text messaging to customers of outages and restoration times). WNP has not included this item in its capital investment program for 2021-2025 due to having no cost estimates or scope of work available; however during this DSP period, the LDC will identify a solution and circle back with customers to determine if this is still a requirement
- **Priority #4a) Invest in the Electric Grid:**
  - ✓ As demonstrated within WNP's DSP, capital investment plans are established with a balance between prudent spending and appropriate levels of asset replacement.
- **Priority #4b) Invest in Tree Trimming:**
  - ✓ WNP has an aggressive 3-year tree trimming schedule and is a direct reflection of the utility's low power outage and duration of outage statistics. WNP will continue with this tree-trimming schedule.
- **Priority #6) Burying Overhead Wires:**
  - ✓ WNP works closely with the Municipality, as well as contractors and developers. When rebuilding infrastructure, placing assets underground is always a consideration and WNP strives to install plant underground when feasible, cost effective and if there is collaborative scheduling.

5.2.1c Sources of Expected Cost Savings

Purpose: The sources of cost savings expected to be achieved over the forecast period through good planning and DSP execution.

It is difficult to quantify specific savings related to good planning and DSP execution. WNP would expect savings through cost avoidance through good planning and DSP execution. By following good maintenance practices and replacing assets in a prioritized approach, WNP mitigates or limits the costs associated with unplanned events. These costs include overtime premiums, call-out fees for sub-contractors, and weather related costs (*for example: working in winter, hot water cost for hydro-vac*). In addition, by continuing with its routine maintenance and inspections of distribution assets, WNP believes that assets will reach their life expectancy and the utility will continue to maintain good system reliability.

In addition, the use of reclosers in new substations limit the call outs. The system will attempt to reclose before locking out. The SCADA system will also provide valuable information about the fault, for example, a lock out due to over current on “blue phase” which helps reduce time troubleshooting.

5.2.1d Period covered by DSP

Purpose: The period covered by the DSP, that is the historical and forecast years.

This Distribution System Plan (DSP) covers the periods of:

- Historical period of 2015-2019 and the current year of 2020 (Bridge Year); and
- Forecast (future) period of 2021 (Test Year) to 2025.

5.2.1e Vintage of Information

Purpose: The vintage of the information on investment drivers used to justify investments identified in the application (i.e. the information is considered current as of what date?)

Sources of information for investment drivers for capital project investments planned for the forecasted period of 2021 to 2025 and included in this DSP are:

- An Asset Condition Assessment (ACA) study as conducted by Kinectrics in 2020 on WNP’s distribution assets (substation transformers, substation load switches, substation switchgear, pole-mount transformers, pad-mount transformers and poles). WNP provided Kinectrics with:
    - GIS data (e.g. size, age, type);
    - Inspection reports (e.g. infra-red, oil sample studies, loading for the period January 2015 to May 2020 and Polux pole-test data for 2019); and
    - Work-order results (e.g. maintenance inspections) for the period January 2019 to May 2020.

- Financial information regarding capital investment projects implemented that were included in WNP's 2015 DSP. Information is January 2015 to May 2020.

5.2.1f Changes to the Asset Management Process

Purpose: A summary of any important changes to the distributor's asset management process (e.g. enhanced asset data quality or scope, improved analytic tools, process refinements, etc.) since WNP's last DSP filing.

Since its previous DSP (2015), WNP has incorporated the following additions into its' asset management process:

- Conducted customer surveys to ratify customers' needs and expectations from their local hydro company. The surveys included feedback from customers about what WNP's capital investment priorities should be.
- WNP has formalized the Asset Condition Assessment (ACA) activity by retaining Kinectrics Inc. to complete a thorough ACA study of its' distribution assets (substation transformers, substation load switches, substation switchgear, pole-mount transformers, pad-mount transformers and poles). This study, conducted in 2020, has assisted the WNP in reaffirming its asset replacement methodology and processes as well as identifying data gaps.
- Pole testing equipment – the LDC purchased a Polux Pole tester to gather enhanced data about the structural integrity of poles. WNP is using this data as additional information to support decisions to replace poles. This was feedback concerning the need for more data to support pole replacement decisions as received from intervening parties during the utility's 2016 Cost of Service application process.
- Continued with the utility's routine maintenance and inspection of assets and equipment.
- Detailed Information Technology and Information Systems plans to support the LDC in maintaining control of data and privacy as well as meeting the requirements of the OEB's cyber-security framework.

5.2.1g Aspects of the DSP Reliant on Ongoing Activities or Future Events

Purpose: 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 (OEB decision on Long Term Load Transfers) and the expected dates by which such outcomes are expected or will be known

WNP is not aware of ongoing activities or future events that may impact or effect the plans for the forecast period of 2021 to 2025 as set-out in this DSP.

The LDC fulfilled all its Long-Term Load Transfer obligations in June 2017 with the exchange of "Bill of Sale" documents between the entities of Hydro One Inc. and Wellington North Power Inc.

As noted in section "5.2.2 Coordinated Planning with Third Parties", WNP has participated in and continues to participate in Regional Planning meetings facilitated by the Independent Electricity System Operator. Based upon the latest information, WNP is not aware of changes required to its' distribution system as a as result of regional planning proposed outcomes.

5.2.1h Grid Modernization, Distributed Energy Resources or Climate Change Projects

Purpose: 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

WNP is monitoring the pilot programs, such as Distributed Energy Resources and battery storage solutions. To date, the utility has received no requests from customers hence why there are no proposed capital investments requested for this new technology included in its' plans for 2021-2025.

WNP has included capital investment for on-going Smart Grid development initiative for the planning period of 2021 to 2025. This includes:

- Equipping all the distribution stations with automated feeder reclosers and supervisory control and data acquisition (SCADA) system.
- Software upgrade of SCADA planned for 2024.
- Upgrade and renewal of revenue meters to comply with the regulations.

5.2.2 Coordinated Planning with Third Parties

This DSP has been prepared through a coordinated planning process with the following stakeholders:

- Independent Electricity Systems Operator (IESO);
- Regionally interconnected Transmitters and Distributors – Hydro One;
- Regional and municipal governments; and
- Customers.

5.2.2a IESO - Description of Consultation

The 2012 "*Renewed Regulatory Framework for Electricity: A Performance-Based Approach*" (RRFE) published by the Ontario Energy Board (OEB) provided direction to develop a more formalized process for regional planning. The purpose of regional system planning is to look at reliability at the regional or local level and consider any overlapping or bulk or distribution planning, as well as any Municipal Energy Plans underway. The Independent Electricity System Operator (IESO) works with the local distribution companies (LDCs) and the transmitter to ensure regional issues and requirements are effectively integrated into the electricity planning processes.

The IESO has segmented the Province of Ontario into 21 electricity regions placed into three groups. WNP's service territory resides in 2 planning groups as illustrated in the table below:

Figure 2: Regional Planning for Group 1 and Group 3

Planning Group	Zone	WNP's Service Areas	Station Names	Connection
Group 1	Kitchener-Waterloo-Cambridge-Guelph	o Arthur	o Fergus TS	o Dx
Group 3	Greater Bruce-Huron	o Mount Forest o Holstein	o Hanover TS o Palmerston TS	o Dx o Dx

Source: http://www.ieso.ca/en/Get-Involved/Regional-Planning/About-Regional-Planning/Overview

WNP did not initiate the consultation but has participated in both the Group 1 and Group 3 Regional Planning meetings facilitated by the IESO. The meetings involve the IESO, Hydro One (Transmitter), Hydro One (Distributor) and LDCs as assigned to the regional group.

Regional planning is a continual process, evaluated every five years, with plans developed for a 20-year outlook. It looks at the unique needs of each region and considers conservation, generation, transmission and distribution and innovative resources to meet these needs.

Planning Group 1: Kitchener-Waterloo-Cambridge-Guelph:

An Integrated Regional Resource Plan (IRRP) has been released for this region which WNP has reviewed. The IESO's Planner for this initiative has shared information with WNP and initiated conference-call meetings. At this time, WNP has advised the IESO Planner of the following:

- The LDC forecasts limited but steady growth in customer numbers, predominately residential, to the service area of Arthur.
- Demand forecast projections for the LDC have been shared with Hydro One who is aware of our electricity demand requirements.
- There is no impact to the LDC.

WNP will continue to monitor the progress of Planning Group 1 as well as engage with the IESO Planner as and when required. The IESO Planner is effectively sharing updates of the projects as the plan moves forward.

Planning Group 3: Greater Bruce-Huron:

Regional planning for the Greater Bruce/Huron Region has started and Hydro One initiated the process with a "Needs Screening". WNP has advised the IESO Planner of the following:

- The LDC forecasts no growth in customer numbers to the service area of Holstein.
- Demand forecast projections for the LDC have been shared with Hydro One who is aware of our electricity demand requirements.
- At this time, there is no impact to the LDC.
- WNP will continue to monitor the progress of Planning Group 1 as well as engage with the IESO Planner as and when required. The IESO Planner is effectively sharing updates of the projects as the plan moves forward.

5.2.2b IESO - Final Deliverable

There is no final deliverable from this consultation and the process is on-going.

WNP has no knowledge of an expected date of when final deliverables from the current regional planning process will be available.

5.2.2c IESO - Relevant Material Documents

Relevant material documents concerning regional planning can be found on the IESO's website.

5.2.2d REG Investment – IESO Comment Letter

WNP submitted a copy of its 2020 Distribution System Plan to the Independent System Electricity Operator (IESO) for review. Of interest, in its reply letter, the IESO stated:

> *"The IESO has reviewed WNP's Plan and notes that it contains no investments specific to connecting Renewable Energy Generation (REG) for the Plan period 2021 – 2025".*
>
> *"The IESO notes that WNP's service territory is within two regional planning groups: Greater Bruce Huron Region and Kitchener-Waterloo-Cambridge-Guelph (KWCG) Region."*
>
> *"…the IESO confirms that WNP has been a participating member of the Working Groups."*
>
> *"The IESO submits that as WNP has no REG investments during the 5-year Distribution System Plan period no comment letter from the IESO is required to address the bullets points in the OEB's Filing Requirements for Electricity Distribution Rate Applications - Chapter 5, section 5.2.2 Coordinated planning with third parties…"*

A copy of the IESO's response upon reviewing Wellington North Power Inc.'s Distribution System Plan is included in the Appendices (Appendix C).

5.2.2a Hydro One (Tx and Dx) - Description of Consultation

WNP shares a feeder with Hydro One's distribution business. Hydro One is the owner of the transformer station and feeder to the limits of WNP service area, at which point, all distribution lines within our service area are owned and operated by WNP.

WNP has an excellent working relationship with Hydro One. Any items or concerns the LDC has are raised with Hydro One's Account Executive who, as part of their portfolio, manages the relationship with WNP. Typically, Hydro One's Account Executive and WNP meet once a year to discuss any on-going concerns or to provide a "heads-up" of future events that may affect either party. This meeting or consultation may be initiated by either party.

5.2.2b Hydro One (Tx and Dx) - Final Deliverable

As discussed in this DSP, WNP is not forecasting or planning any changes to the load, renewable generation connections and the utility has been actively participating in regional planning meetings.

With no changes noted, HONI Transmission and HONI Distributor are not required to review or comment on WNP's DSP.

5.2.2c Hydro One (Tx and Dx) - Relevant Material Documents

Because there are no current or on-going concerns or issues between Hydro One and WNP, there are no relevant material documents at this time.

5.2.2a Municipal Government - Description of Consultation

The lower-tier municipal government in WNP's service area is the Township of Wellington North. The Township of Wellington North relies on the County of Wellington, upper-tier regional government, for planning activities. The utility receives information from the Township of Wellington North and WNP has a copy of the County's and the Township's most recent long-term planning documents.

The Township shares its' capital investment budget with WNP which is updated every year. This provides an opportunity for the LDC to review third-party infrastructure projects (such as water and sewer renewal or re-surfacing roads) where WNP may need to move or relocate assets (i.e. poles or pad mount transformers.)

The Township has created the "Wellington North Community Growth Plan"[2] (the "*Growth Plan*") to provide direction for policy development and decision-making regarding land development, growth-related investments and initiatives to contribute to planning for positive growth and change in Wellington North. As per this report:

> *"While the Plan is comprehensive in nature, its purpose is to outline recommendations for the direction and management of potential future urban growth, which will occur primarily in the urban areas of Arthur and Mount Forest."*

The urban areas of Arthur and Mount Forest are serviced by WNP.

WNP participated in the creation of the "Growth Plan", with the CEO/President of the utility included in the "Community Growth Plan Steering Committee".

[2] "Wellington North Community Growth Plan – Final Report", Township of Wellington North, February 2018

5.2.2b Municipal Government - Final Deliverable

The Township's "Wellington North Community Growth Plan" includes information about population forecasts, sourced from the "Wellington County Official Plan". Of relevance to WNP, there is forecasted population growth in the urban areas of Arthur and Mount Forest which are serviced by WNP:

Figure 3: Wellington North Growth Forecasts by Area

Township of Wellington North			
	2016	**2036**	**2041**
Arthur			
Population	2,725	3,700	3,670
Households	1,005	1,370	1,370
Mount Forest			
Population	5,190	8,550	9,230
Households	2,150	3,365	3,625
Outside Urban Centres			
Population	4,575	4,835	4,785
Households	1,480	1,595	1,595

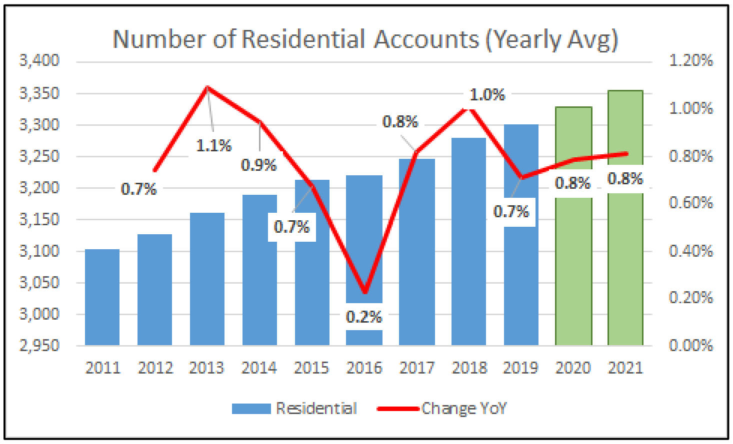
Source: County of Wellington Official Plan, Table 2

Of interest to WNP:

a) The forecast directs the most population and housing growth to Mount Forest as the largest urban area with the greatest servicing capacity available for future development, with an average annual growth rate of 3.1%. Mount Forest's average annual growth rate for the period of 2011 to 2016 was 1.6%.
b) The forecast population growth in Arthur reflects an average 1.8% population from 2016 to 2036. After 2036, the forecast reflects no further residential growth, which would result in a small decline in Arthur's population.
c) The "Growth Report" mentions an increase in intensification (i.e. number of people per hectare). New residential properties to accommodate the increasing population will be available by:
    i. Re-developing vacant land;
    ii. Re-zoning some urban land from commercial/industrial to residential; and
    iii. New residential properties to be built upwards (i.e. more multi-unit apartment buildings).

The chart below shows the actual number (years 2011 to 2019) and forecast number (2020 and 2021) Residential customer accounts with WNP:

Figure 4: Number of WNP Residential Account



Note: Number of Residential accounts is the average count of accounts for the year.

The above chart demonstrates that WNP has not yet experienced the growth projections as forecasted in the Township's "Wellington North Community Growth Plan" (i.e. annual growth rates of between 1.8% and 3.1%). WNP has seen an average increase of 0.7% new Residential accounts from 2016 to 2019.

(Note: WNP is the hydro provider for the urban areas of Arthur and Mount Forest; the rural parts of these areas, which will have been included in the County's growth projections, receive hydro from Hydro One.)

How is the LDC preparing for this anticipated growth?

WNP is preparing for population and household growth by:

a) <u>Load Capacity - MS4 substation in Mount Forest:</u>
WNP's MS4 substation in Mount Forest is currently operating with minimal load. This substation can handle additional load should there be an immediate increase in demand. MS4 substation is circa 1970s; however, because there is minimal load on this station, it is not a critical asset for replacement.

b) <u>Load Capacity – Arthur:</u>
In Arthur, over the past several years, there has been restricted growth in residential properties and business, industrial and commercial due to waste-water capacity issues. In quarter 4 2020, completion of engineering initiatives will increase waste-water flow-through capacity with other solutions planned to be implemented during 2021.

Concerning hydro demand, there is sufficient capacity to handle increased demand as projected by the Township and the County. WNP is already working with Developers to review new-subdivisions and servicing requirements.

Implications to DSP?

The meetings with and reports from municipal government provide a good source of information for consideration in WNP’s DSP 5-year capital plan. As noted above, there is anticipated population growth in WNP’s community and, over the capital investment period 2021-2025, the utility does not anticipate system capacity constraints or replacement of major assets (such as substations) to meet demand during this planning cycle.

WNP has reviewed the Township’s capital investment plans and included any work required by the utility into WNP’s capital plan for 2021-2025 to accommodate for known third-party infrastructure developments requiring system plant relocates.

WNP has used historical averages to determine the expenditure level for system access, namely customer service requests for new connections or for modifications / amendments from the LDC’s distribution equipment up to the entry point of the property. This has been inputted into WNP’s capital plan for 2021-2025.

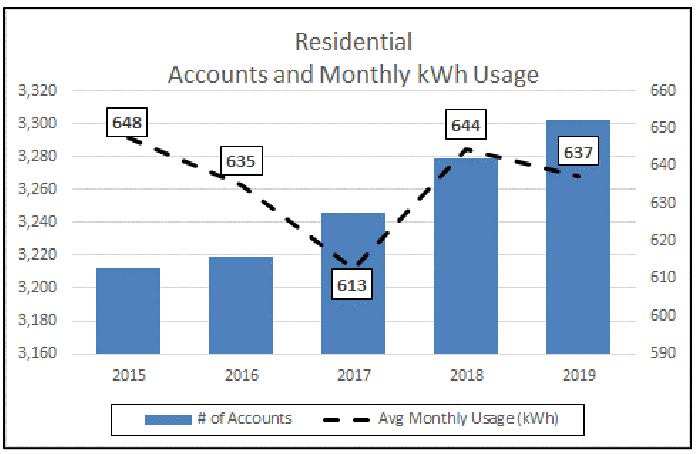
5.2.2c Municipal Government - Relevant Material Documents

The LDC reviews municipal and county reports received at the Township of Wellington North which are presented at Council meetings, including County reports identifying land that may be considered for development and building permits issued to developers.

The utility has a separate Developer Agreement to that of the Township. For any new developments or expansion, developers are required to contact WNP to discuss their hydro servicing requirements. WNP responds to each developer's request.

Although the number of Residential accounts has increased by an average of 0.7% over the period of 2015-2019, the average monthly consumption per Residential customer has declined as illustrated in the chart below:

Figure 5: Residential Average Monthly kWh Metered Usage (kWh).



Note: Number of Residential accounts is as at December 31st of each year

(Note: For the year 2018, the average monthly kWh usage was above prior years due to an above average warmer summer than normal, resulting in an increase in the use of air-conditioning.)

This monthly kWh residential consumption reduction could be attributed to energy conservation programs, more efficient household appliances and better insulation for newer build properties. Therefore, growth in the number of residential properties should not create demand capacity concerns for WNP over the next 5-year planning period.

In 2016, with assistance from Hydro One Networks Inc. (HONI), WNP installed a new 44kV feeder to the Town of Mount Forest to address capacity concerns. Discussions with HONI had revealed the current supply to Mount Forest was at capacity limiting any further growth and development in the area.

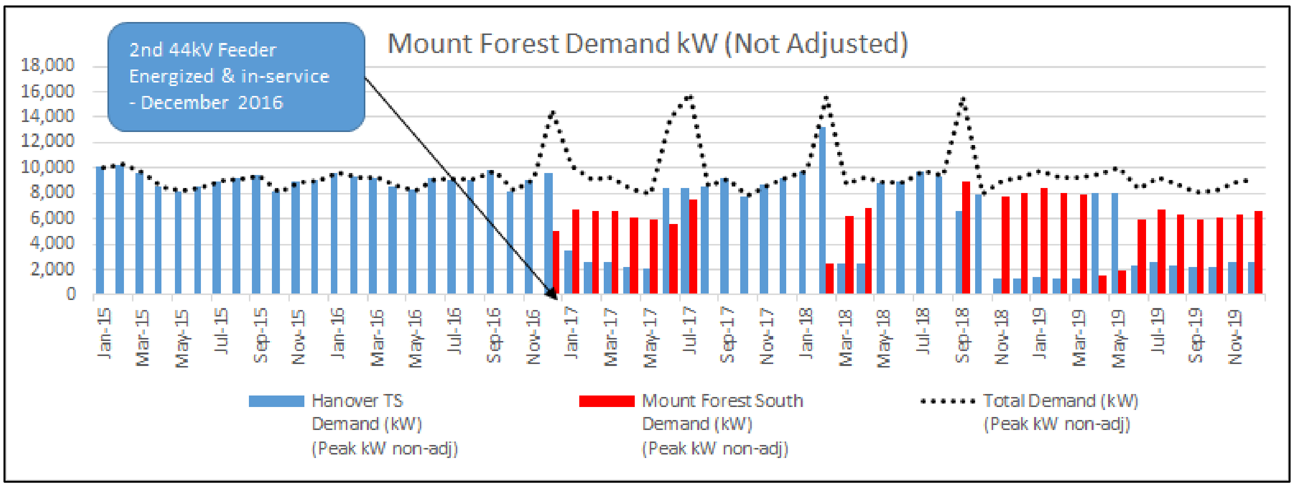
All of Mount Forest was fed from the north, Hanover TS; however with installation of the new 2nd 44kV feeder in 2016, part or all of the town can now be fed from the south, Palmerston TS. This capital investment project was included in WNP's 2015 Distribution System Plan[3]. In its' 2015 DSP, WNP included information of it load forecast provided to HONI for years 2013-2038 at the HONI delivery point for Mount Forest – this replicated below for years 2015 to 2019:

Figure 6: Mount Forest Forecasted Demand kW –2015 to 2019).

Peak	2015	2016	2017	2018	2019
Summer	10,154	10,605	10,664	11,213	11,762
Winter	10,357	10,817	10,877	11,437	11,997

The new 2nd 44kV feeder was energized in December 2016 as per plan and as predicted in WNP's 2015 DSP. The chart below illustrates the actual demand for Mount Forest for 2015-2019:

Figure 7: Mount Forest Demand kW – January 2015 to December 2019).



Source: Monthly Demand kW HONI invoiced to WNP for Sub-transmission Hanover TS and Palmerston TS
Mount Forest South PME – Common ST Lines Demand kW (not loss adjusted)

The above chart illustrates monthly demand before and after the energization of the new 2nd line 44kV feeder and has remained fairly constant at between 8,000 kW and 10,000 kW per month. (The dotted black line is the sum of both feeders demand kW. The spikes in demand occur when there is line-switching by HONI and the utility is billed for a double-peak demand.)

The Township of Wellington North's "Wellington North Community Growth Plan" can be viewed at the Township's website at:
https://wellington-north.com/government/strategic-plan/community-growth-plan-final-report

At the time of preparing its 2020 DSP, WNP is not aware of any new renewable connections over the planning period 2021-2025 as a part of "Wellington North Community Growth Plan" report.

[3] Wellington North Power Inc. 2015 Distribution System Plan (filed with its Cost of Service application: EB-2015-0110) – Section 5.4.5.3 Special Capital Projects; sub-section 5.4.5.3.1 Second 44kV Feeder to Mount Forest

5.2.2a Customers - Description of Consultation

WNP consults and interacts with its customers using a variety of channels:

- **Office** – Accessible office open to the general public 5 days a week from 8:30am to 4:30pm:
  Customers can visit to talk to Customer Service employees about a whole range of topics including billing queries, pay their hydro bills, set-up payment arrangements, request disconnection or reconnection of hydro and queries concerning high/low hydro usage.
  Customers, contractors and developers can meet with members of the Operations team to review service-layout plans, sizing requirements for new developments and all matter of technical subjects.
  Since March 17th 2020, WNP has closed its' office to customers due to the COVID-19 pandemic; however since August, the utility is accepting customers by pre-arranged appointment adhering to public health guidelines including pre-screening checks and wearing of masks.

- **Community:**
  WNP supports local community businesses by:
  - The utility does its' banking at one of the financial institutions in the Town of Mount Forest;
  - Gets bill inserts printed at the local specialist printing store;
  - Purchases office supplies and equipment from a local stationery store;
  - Uses hardware stores to order and purchase equipment for the office or workshops as well as tools and equipment when applicable.

  During visits to these local stores, store owners often ask WNP employees about their hydro bill or what caused last night's power outage.
  Prior to March 2019, WNP hosted a kiosk at local Spring and Fall festivals to promote electrical safety and energy-saving programs.

- **Business Customer meetings:**
  WNP staff attend business meetings to answer questions related to the hydro industry. For example, the CEO/President meets with the large Industrial and Commercial customers at least once a year to address concerns about reliability and capacity as well as discuss programs and incentives available to help manage costs and reduce their demand.

  WNP attends the Chamber of Commerce meetings when invited to listen to businesses concerns about hydro and present information. For example, WNP presented information to the Arthur Chamber of Commerce in 2016 to address concerns about power outages as a result of ice storms in March of that year.

- **Open-House:**

  In 2018, WNP replaced one of its' municipal substations, MS3, which is located near a residential neighbourhood. The utility hosted an "Open-House" in April 2018, inviting 46 residents who lived close to the construction site as an opportunity to:

  - Provide details of why the substation is being replaced and what it involves (i.e. decommissioning of the "old" substation, delivery and assembly of "new" substation.)
  - Share traffic plan: WNP worked with the Township to create a traffic plan to minimize congestion, work and noise as heavy equipment and materials are delivered to the site.
  - Meet the Operations team as well as the engineering contractor and ask questions.

  Eight residents attended the "Open House" and appreciated WNP's efforts to share its traffic plans to minimize noise and disruption during the construction period.

- **Customer Satisfaction Survey - OEB Requirement for Scorecard:**

  The OEB requires LDCs to conduct customer satisfaction surveys every two years and report the results on the utility's Scorecard. To fulfil OEB obligations concerning statistically sound results, the utility retains a third-party, Redhead Media Solutions Inc., to conduct the surveys by telephone interviewing a sample size of 300 customers consisting of Residential and Small Business customers. The survey canvasses customer satisfaction in the areas of power quality and reliability; price; billing and payment; communications; and overall customer service experience.

- **Customer Survey:**

  In preparing for its' Cost of Service rate application, in Quarter 4 of 2019, WNP initiated Customer Surveys inviting Residential, Small Business and Industrial & Commercial customers to provide feedback. The survey questions were prepared by WNP with:

  a) Residential & Small Business customers able to access the survey through the LDC's website, through an on-line survey platform (Survey Monkey ©) or available at the office for walk-in customers (i.e. seniors who may not have access to computer.)
  b) Industrial and Commercial customers received an e-mail from WNP's CEO/President with the survey attached for the customer to complete and return.

  The surveys contained the same questions for each customer segment, focusing on:

1	Overall Satisfaction
2	Rating of Service Provided by the utility
3	Power outages
4	Effectiveness during an Outage (response & communications
5	Company profile
6	Investment priorities
7	Price and reliability
8	Trust the LDC

The table below summarizes the response rate for each customer segment:

Figure 8: Customer Survey Response

Customer Segment	# of Surveys Completed	Response Rate *
Residential	219	7%
Small Business	12	3%
Industrial/Commercial	3	75%

** Response rate is calculated by number completed & received divided by number of accounts in the rate-class as at December 31st 2019.*

The LDC acknowledges response rate is not statistically significant; however the responses do provide valuable feedback to how our customers perceive the services offered by WNP.

5.2.2b Customers - Final Deliverable

The table below illustrates the bi-annual Customer Satisfaction results for surveys carried out on WNP's customers in 2016 and 2018 and as reported on the LDC's Scorecard:

Figure 9: Customer Satisfaction Survey

Year of Survey	Satisfaction Score	Survey Sample Size
2016	79.00%	*N=300*
2018	81.10%	*N=300*

Of relevance to its' DSP for capital planning years 2021-2025, WNP included the following questions in its' customer surveys:

a) *Service rating:*
   Statement: "Provide consistent reliable electricity."
   Statement: "Efficient at managing the electric system."
   Customers were given the options of selecting "Agree", "Disagree" or "Undecided" to answer these statements. The chart below summarizes the collated responses:

Figure 10: Customer Survey: Reliability

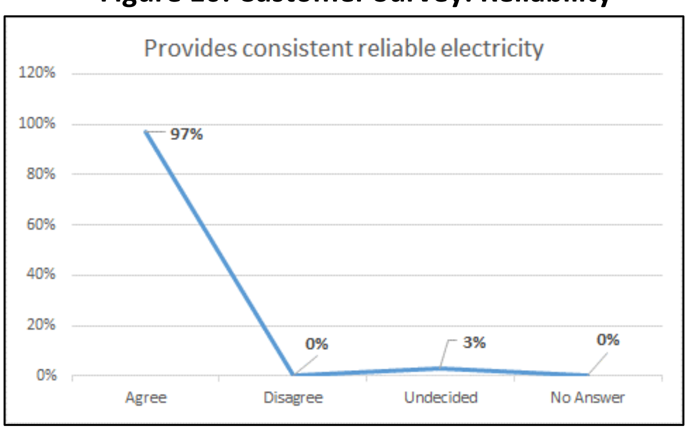
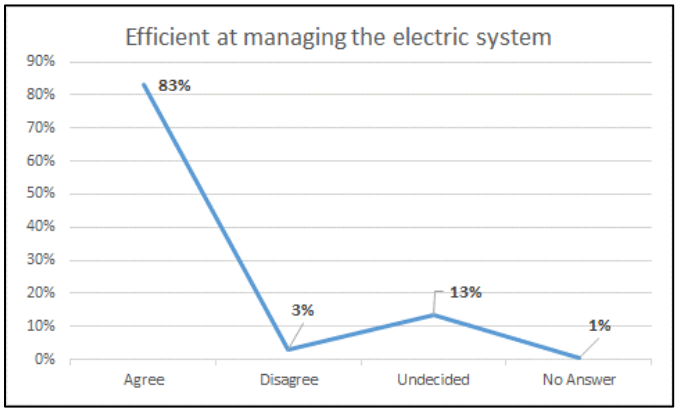


Figure 10 illustrated that 97% of all customers (Residential, Small Businesses and Industrial & Commercial (I&C)) that participated in the Customer Surveys "agreed" that WNP provides consistent reliable electricity.

The chart below illustrates that 83% of all participating survey respondents "agreed" that WNP was efficient at managing the electric system (i.e. quick to respond to problems and performed maintenance & repairs swiftly):

Figure 11: Customer Survey: Efficient



The table below shows responses segmented by customer rate class concerning the above two statements about WNP operating a reliable and efficient electric system:

Figure 12: Customer Survey: Reliable and Efficient

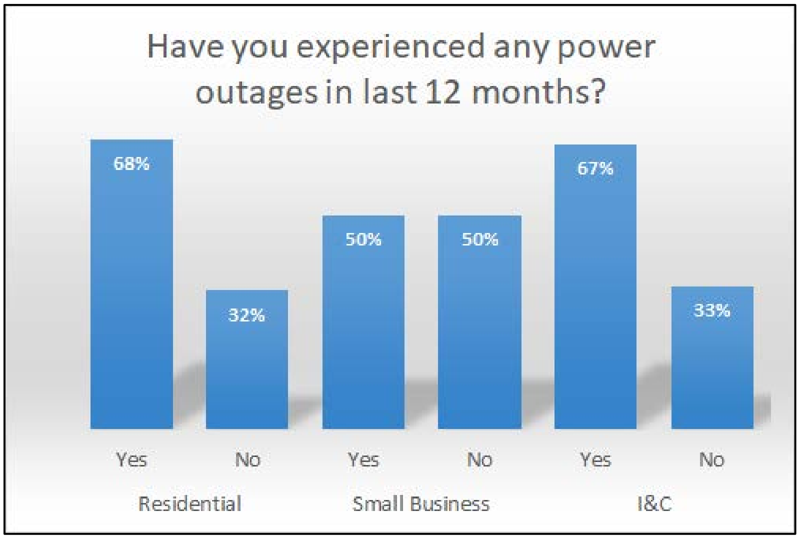
	Response	Provides consistent reliable electricity	Efficient at managing the electric system
Residential	Agree	99%	83%
	Disagree	0%	0%
	Undecided	0%	15%
	No Answer	0%	2%
Small Business	Agree	92%	67%
	Disagree	0%	8%
	Undecided	8%	25%
	No Answer	0%	0%
Industrial/ Commercial	Agree	100%	100%
	Disagree	0%	0%
	Undecided	0%	0%
	No Answer	0%	0%

Implications to DSP?

Taking into consideration this customer feedback concerning the reliability of utility's distribution system, WNP does not need to invest in a major overhaul of its system. Reliability is not currently being noted as a concern to customers and therefore, WNP should continue to invest in maintaining the reliability of its' distribution system.

b) *Power Outages:*
"Have you experienced any power outages in the last 12 months?"
Customers were provided with the response option of "Yes" or "No". The chart below illustrates the response to this question split by each customer rate class:

Figure 13: Customer Survey: Experienced a Power Outage during the last 12 months



Over 50% of survey respondents in each rate class answered "Yes", they had experienced a power outage during the last 12 months. WNP reviewed its power outage records and did not see anything peculiar or abnormal in 2019; in fact the number of customers affected and customer hours of interruption for 2019 was lower than in prior years of 2017 and 2018 as shown below:

Figure 14: Power Outage Records 2017-2019

		2019		2018		2017	
Code	Cause	Total Customers Affected	Total Customer Hours	Total Customers Affected	Total Customer Hours	Total Customers Affected	Total Customer Hours
1	Scheduled	291.00	199.80	246.00	186.02	509.00	273.00
2	Loss of Supply	7,115.00	2,288.58	15,970.00	37,794.20	14,745.00	14,028.70
3	Tree Contact	1.00	1.57	1.00	6.13	1.00	1.00
4	Lightning	-	-	-	-	-	-
5	Defective Equipment	40.00	84.63	876.00	248.70	38.00	36.32
6	Weather	48.00	244.27	92.00	114.70	22.00	40.17
7	Adverse Environment	-	-	12.00	2.23	-	-
8	Human Element	-	-	-	-	-	-
9	Animal	16.00	93.32	42.00	1,280.32	9.00	20.33
0	Other	356.00	305.37	-	-	1.00	0.03
	Total	**7,867.00**	**3,217.53**	**11,084.53**	**14,302.07**	**15,325.00**	**14,399.55**

In 2019, there were no major events, such as an ice-storm, which customers and employees remember for many years. As discussed in section "5.2.3: System Reliability and Performance", for 2019, WNP's SAIFI was 0.20 times which is marginally above the range of the utility's 5-year average SAIFI performance of 0.15. This frequency of increased power outages was primarily a consequence of planned projects, such as pole-line replacement in a residential area, does result in residential customers experiencing a brief power outage to enable crews to work safely rather than work on a "live system". WNP counts each residential property individually when there is a power-outage.

Implications to DSP?

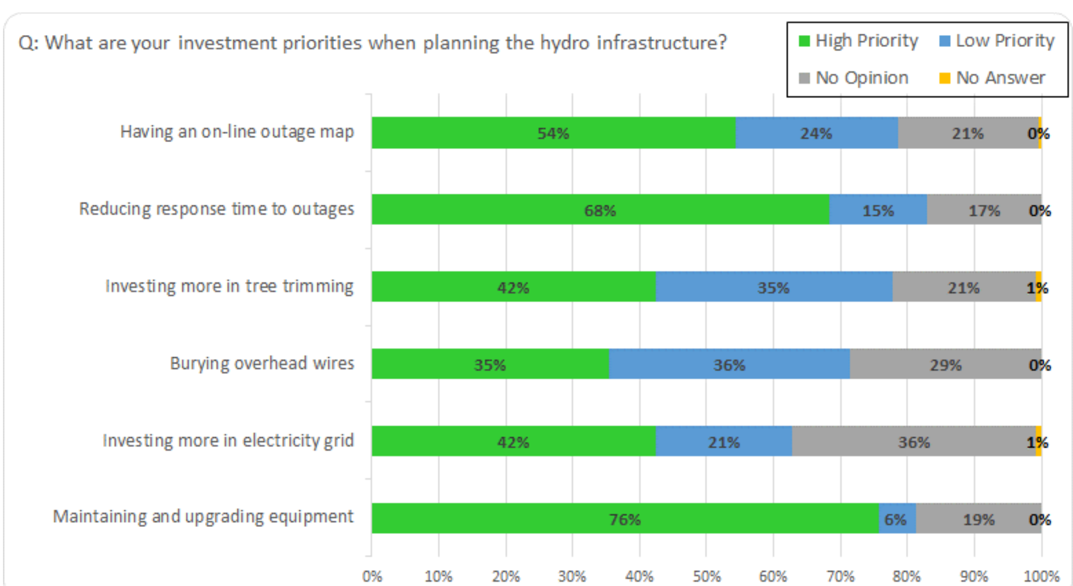
Taking into consideration this customer feedback that customer's had experience a power outage during the past 12 months, WNP does not need to invest in a major overhaul of its system. Reliability is not currently not a being noted as a concern to customers and therefore, WNP should continue to invest in maintaining the reliability of its' distribution system.

c) *Investment Priorities:*
"What are your investment priorities when planning the hydro infrastructure?"

This question sought customers' opinions about how WNP should invest. Customers were provided with a series of statements enabling respondents to choose either "High Priority", "Low Priority" or "No Opinion" with each statement.

The chart below illustrates the collated responses (from all Residential, Small Business and I&C customers who responded) to the 6 investment statements included in the survey:

Figure 15: Customer Survey: Investment Planning Priorities



From the collated responses the top "high priority" statements for investment prioritization are:

1st - "Maintaining and upgrading equipment" - 76% of all respondents;
2nd - "Reducing response time to outages" - 68% of all respondents;
3rd -"Having an on-line outage map" - 54% all respondents.
Joint 4th - "Investing more in the electricity grid" - 42% of all respondents; and
Joint 4th - "Investing more in tree-trimming" - 42% of all respondents.

Note: In collating the survey responses, there was no weighting applied (i.e. each customer's vote, regardless of rate-class, was counted as 1 vote.)

The table below shows how the different customer rate-class ranked each statement as "High Priority":

Figure 16: Customer Survey: Investment Planning Priorities – Ranked a "High Priority" by Rate Class

	Residential		**Small Business**		**I&C**	
	High Priority	Ranking	High Priority	Ranking	High Priority	Ranking
Maintaining and upgrading equipment	76%	1	67%	1	67%	2
Investing more in electricity grid	42%	5	50%	3	67%	2
Burying overhead wires	37%	6	17%	6	0%	6
Investing more in tree trimming	43%	4	25%	5	33%	4
Reducing response time to outages	68%	2	58%	2	100%	1
Having an on-line outage map	55%	3	50%	3	33%	4
# of survey respondents	*219*		*12*		*3*	

Dissecting the results by customer-rate-class, the following observations can be drawn:

- High Priority rankings for Residential and Small Business customers for the top rated statements are the same (i.e. "Maintaining and upgrading equipment" (1st); "Reducing response times to outages" (2nd); and "Having an Outage Map" (3rd).
- "Maintaining and upgrading equipment" was rated as the most important "High Priority" by Residential and Small Business customers.
- "Reducing response times to outages" was rated as the most important "High Priority" by I&C customers. I&C customers are reliant upon having a reliable power source to operate their facility. Outages can lead to shifts being cancelled and even plant closure until power is restored. WNP is not surprised that "reducing response times to outages" was the highest priority of I&C customers.
- "Reducing response times to outages" was rated as the second most important "High Priority" by Residential and Small Business customers.
- "Maintaining and upgrading equipment" was rated as the most joint second important "High Priority" by I&C customers together with "Investing more in the electricity grid".

Implications to DSP?

"Maintaining and upgrading equipment" was the number one "High Priority" statement as rated by Residential and Small Business customers. WNP needs to continue with its investment in maintaining the reliability of the distribution system at a pace that does not excessively increase hydro-rates year-over-year. This planning is through good asset condition assessment programs that will assist in making informed asset replacement priority decisions.

WNP retained a third-party to perform an Asset Condition Assessment (ACA). (The findings of the ACA has been reviewed by the utility and is included in Appendix B). Based upon the findings of the ACA, WNP has created an annual plan to replace assets that have been identified as having a high degradation rate (high probability of failure). This annual replacement work and capital investment forms part of WNP's 5-year capital investment plan, shown as a budget item of "Annual Activities (Pole & Transformer Replacements)".

"Reducing response time to outages" was rated as number one high priority by I&C customers and number two by Residential and Small Business customers. As discussed in section "5.2.3. Performance Measurement", WNP's System Average Interruption Duration Index (SAIDI) performance over the 5-year period 2015-2019 has been below the OEB's 5-year target for the utility (based on adjusted results excluding Loss of Supply and Major Events). In WNP's opinion, the reliability of its' distribution system has not been an issue.

As illustrated below, (figure 17) the number of customers affected by power outages and total customers hours of interruptions in 2019 was at its' lowest level during the 5-year period of 2015-2019:

Figure 17: Power Outages – All Causes of Interruptions from 2015 to 2019

		All Causes of Interruptions									
		2015		2016		2017		2018		2019	
Code	Description	Total Customers Affected	Total Customer Hours	Total Customers Affected	Total Customer Hours	Total Customers Affected	Total Customer Hours	Total Customers Affected	Total Customer Hours	Total Customers Affected	Total Customer Hours
1	Scheduled	154	146.87	346	209.72	529	276.17	248	187.12	291	199.80
2	Loss of Supply	17,728	34,856.75	10,230	16,330.52	14,745	14,028.70	10,554	15,919.37	7,115	2,288.58
3	Tree Contact	0	0.00	28	7.93	1	1.00	1	6.30	1	1.57
4	Lightning	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
5	Defective Equipment	30	42.97	54	55.37	38	36.32	875	247.70	40	84.63
6	Weather	10	12.33	609	2,216.20	22	40.17	92	114.70	48	244.27
7	Adverse Environment	0	0.00	0	0.00	0	0.00	12	2.23	0	0.00
8	Human Element	6	1.50	1	94.67	0	0.00	0	0.00	0	0.00
9	Animal	2	8.53	1	0.98	9	20.33	42	41.32	0	93.32
10	Other	16	26.02	1	0.17	1	0.03	0	0.00	356	305.37
	Major Event			0.00	0.00	0.00	0.00	5,417	21,875.83	0.00	0.00
	Total	17,946	35,095	11,270	18,916	15,345	14,403	17,241	38,395	7,851	3,218

The above table shows total customers affected and total customer hours of interruption for all causes of power outages including Loss of Supply and Major Events.

The table below illustrates the unadjusted (i.e. including Loss of Supply and Major Events) System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) for the period 2015-2019:

Figure 18: SAIDI & SAIFI including Loss of Supply and Major Events

Index	2015	2016	2017	2018	2019
SAIDI	9.310	5.050	3.790	10.030	0.840
SAIFI	4.760	3.010	4.040	4.510	2.040
				SAIDI 5-year average	5.804
				SAIFI 5-year average	3.672

In 2019, the utility experienced fewer "Loss of Supply" power outages when compared to prior years 2015 to 2018. This resulted in fewer total customer hours of interruptions and less total customers affected due to the outages. Furthermore, the LDC had no Major Event power outages in 2019.

In WNP's opinion, based upon its' past 5-year performance, the reliability of its' distribution system or responding to power outages have not been an issue. However, by replacing the assets with a poor health index as identified in the Asset Condition Assessment report may potentially reduce the probability of a power outage occurring due to defective equipment. As noted above, these assets identified as having poor health have been included for replacement during WNP's 5-year capital investment program for the period 2021 to 2025.

"Investing more in the electricity grid" was ranked as a 2nd "High Priority" by I&C customers with Residential and Small Business ranking this statement 5th and 3rd respectively. This statement was included in the Customer Survey intended to gain feedback about grid-modernization and new technology; however in reflection the statement was poorly worded hence the high "no opinion" response by 37% of residential customers. The LDC should consider including articles about grid-modernization and new technology in future newspaper articles to inform our customers. To date, WNP has received no enquiries from customers about battery storage solutions or alternative energy solutions. The utility is monitoring the outcomes of the Distributed Energy Resources[4] (DERs) pilot projects that are in operation. As at the time of preparing this DSP, the utility has received limited requests for DER information, more specifically, behind the meter battery storage options, from its' Industrial and Commercial customers yet WNP is willing to work with customers should a project arise.

[4] Distributed Energy Resources are electricity-producing resources or controllable loads that are connected to a local distribution system or connected to a host facility within the local distribution system. DERs can include solar panels, combined heat and power plants, electricity storage, small natural gas-fueled generators, electric vehicles and controllable loads, such as HVAC systems and electric water heaters.

In its capital investment plan for 2021-2025, WNP has included “Smart Technology” as an on-going annual investment. This work includes the installation of smart technology on substation feeders and primary metering equipment to assist WNP identify load loss.

“Having an outage map” was ranked 3rd as a “High Priority” by Residential and Small Business customers and 4th by I&C customers. In 2018, WNP had a 3rd-party vendor presentation concerning outage maps and subsequently received an informal quote of circa $27,000 for solution design, interfacing with the LDC’s GIS system and implementation plus approx. $10,000 for annual software maintenance and licensing fees. At the time, the LDC did not accept the quote; however, based upon feedback from customers, the utility will start exploring what “outage map” solutions exist and whether there are other alternatives (e.g. SMS text messaging to customers of outages and restoration times). WNP has not included this item in its capital investment program for 2021-2025 due to having no cost estimates or scope of work available; however during this DSP period, the LDC will identify a solution and circle back with customers to determine if this is still a requirement.

WNP planned to host a community meeting in May 2020 to present its proposed operating budget for 2021 and 5-year capital investment plan for 2021-2025 incorporating feedback from customer surveys; however due to the COVID-19 pandemic and public health guidelines regarding social distancing, this meeting did not happen. Consequently, WNP has taken the following steps to follow-up with and inform our customers:

a) August 2020: Posted the results of the customer surveys on WNP’s website. The results are condensed into individual reports (residential, small business and industrial and commercial reports) and written in plain language. Customers are encouraged to contact us if they want further information or have questions. (At the time of preparing this report, the LDC has received no questions or comments from customers.)
b) August 2020: Included a bill insert and on-line bill message informing customers to review WNP’s website for the results of the 2019 customer surveys.

5.2.2c Customers - Relevant Material Documents

Customer Surveys reports for customer rate-classes Residential, Small Business and Industrial & Commercial are included in Appendix D.

5.2.3 Performance Measurement for Continuous Improvement

5.2.3a Methods & Measures to Monitor DSP Planning Process Performance

WNP measures and monitors its' operating performance using the following performance indicators:

- Customer service quality indicators;
- Supply system reliability & performance indicators;
- Operational effectiveness indicators;
- Planning quality indicators;
- Financial performance indicators; and
- CDM program targets and performance.

The metrics and methods for measurement of each performance indicator is described below:

o Customer Service Quality Indicators

The Distribution System Code (DSC) details the minimum service quality requirements that a distributor must meet in carrying out its obligations to distribute electricity under its license and the Energy Competition Act, 1998. WNP records service quality data for activities such as service accessibility, appointment scheduling, telephone call answer rate and emergency response times. As per the Ontario Energy Board (OEB) "Reporting and Record Keeping Requirements" (RRR), WNP submits its service quality data information to the regulator on an annual basis. This information is used to evaluate WNP's service quality performance against the OEB expected targets.

The Customer Service Quality Indicators consist of:

- Connection of New Services;
- Appointment Scheduling;
- Appointments Met;
- Rescheduling a Missed Appointment;
- Telephone Accessibility;
- Telephone Call Abandonment Rate;
- Written Response to Enquiries;
- Emergency Response; and
- Reconnection Performance Standard.

Below is a summary of how each of these service quality indicators are measured:

Connection of New Services:

The OEB's requirements for the connection of new services in Section 7.2 of the DSC are:

- A connection for a new service request for a low voltage (<750 volts) service must be completed within 5 business days from the day on which all applicable service conditions are satisfied, or at such later date as agreed to by the customer and distributor.
- A connection for a new service request for a high voltage (>750 volts) service must be completed within 10 business days from the day on which all applicable service conditions are satisfied, or at such later date as agreed to by the customer and distributor.
- Mandated by OEB, this service quality requirement must be met at least 90% of the time on a yearly basis.

The LDC does not have any high voltage services in its' service territory.

Scheduled Appointments Met:

The OEB's requirements for fulfilling scheduled appointments as per Section 7.4.1 of the DSC is the distributor must then arrive for the appointment within the scheduled timeframe when the appointment is either:

a) Requested by a customer or a representative of a customer with a distributor; or
b) Required by a distributor with a customer or representative of a customer, the distributor must offer to schedule the appointment during the distributor's regular hours of operation within a window of time that is no greater than 4 hours (i.e., morning, afternoon or, if available, evening).

Mandated by OEB, this service quality requirement must be met at least 90% of the time on a yearly basis

Telephone Accessibility

The OEB requires that qualified incoming calls to the distributor's customer care telephone number must be answered within the 30-seconds time period established as below:

- For qualified incoming calls that are transferred from the distributor's IVR system, the 30 seconds shall be counted from the time the customer selects to speak to a customer service representative.
- In all other cases, the 30 seconds shall be counted from the first ring.
- Mandated by the OEB, this service quality requirement must be met at least 65% of the time on a yearly basis.

During business hours, WNP Customer Service Representatives (CSRs) live-answer all telephone calls. The answer-rate of CSRs is captured in a call-reporting software package that records the number of inbound telephone calls, call answer times (i.e. from the moment of the 1st ring until call is picked-up by a CSR) and number of abandoned calls (i.e. the caller hangs-up).

Response Time To Emergencies

The OEB requires that emergency calls must be responded to within 120 minutes in rural areas and within 60 minutes in urban areas. This service quality requirement must be met at least 80% of the time on a yearly basis. WNP service territory is urban, therefore for this indicator, the LDC wants to be below the 60 minute response time as set by the OEB for urban areas.

Examples of emergencies that WNP respond to include a vehicle collision with a hydro pole, a hydro pole on fire or sparking, a hydro wire down and a fire at house/apartment where the fire department have requested the LDC to disconnect the service to the property.

First Contact Resolution

WNP defines “First Contact Resolution” as the number of customer service enquiries received by telephone, letter, fax or e-mail that are resolved by the first contact person at the utility (i.e. the query is not escalated to an alternative person at the company such as a supervisor or a manager.)

Billing Accuracy

The OEB developed and implemented a uniform measure for billing accuracy in 2014 and subsequently established a 98% target for the measure. Billing Accuracy is defined as the number of accurate bills issued shown as a percentage of total bills issued.

Customer Satisfaction Survey - OEB-mandated

The OEB requires LDCs to conduct customer satisfaction surveys every two years and report the results on the utility’s Scorecard. Surveys will, at a minimum, canvass customer satisfaction in the following key areas:

- Power quality and reliability;
- Price;
- Billing and payment;
- Communications; and
- The customer service experience.

Distributors are expected to follow good survey practices. WNP uses a third-party market survey company to conduct its surveys in order to meet the specific requirements of the regulator.

Customer Satisfaction Survey – LDC Initiated

WNP conducts random surveys asking customers to indicate if they are satisfied or not satisfied with work completed by the utility. Customer Service staff create “Work Orders” (a work instruction) for the Operations Department for activities including Connection of a New Service; a Temporary Connection; Locates; Service Layout, Trench Inspection. Upon completion of the work:

- A member of the Operations Department visits the site, hands the “Work Order” to the customer to sign to confirm the work has completed.
- WNP randomly select between 10% - 15% of “Work Orders” where a customer requested WNP to perform work. The utility telephones these customers to ask if they were satisfied with the work that the utility completed.

o System Reliability & Performance

For supply system reliability, the key performance indicators are:

- o System Average Interruption Duration Index ("SAIDI") and;
- o System Average Interruption Frequency Index ("SAIFI").

System Average Interruption Duration Index ("SAIDI")

SAIDI is an index of system reliability that expresses the average duration that electricity supply to a customer is interrupted. It is determined by:

$$\frac{Total\ Customer\ Hours\ of\ Interruptions}{Average\ Number\ of\ Customers} = SAIDI$$

WNP records the power outage start time as the time the LDC received communication from a customer reporting the interruption.

The OEB expects a utility to keep its hours of interruption within the range of its 5-year historical performance average.

System Average Interruption Frequency Index ("SAIFI")

SAIFI is an index of system reliability that expresses the number of times that electricity supply to a customer is interrupted. It is determined by:

$$\frac{Total\ Customer\ Interruptions}{Average\ Number\ of\ Customers} = SAIFI$$

The OEB expects a utility to keep its frequency of interruptions within the range of its 5-year historical performance average.

Major Events

In May 2016, the OEB introduced amendments to the "Reporting and Record Keeping Requirements (RRR) Regarding System Reliability"[5]. The amendments introduced a definition of a "Major Event" and the reporting requirements used to evaluate a distributor's response to a major event. Distributors are expected to file a Major Event Response Reporting (MERR) questionnaire within 60 days of the event. The OEB revised the MERR questionnaire in January 2020[6].

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[5] EB-2015-0182 "Amendments to the Reporting and Record Keeping Requirements Regarding System Reliability" letter, dated May 3, 2016

[6] OEB letter "New RRR Filing System Go-Live. Amendments to Reporting and Record-keeping Requirements (RRR) Major Event Response Reporting Improvements" dated January 23, 2020.

The OEB has defined a Major Event as:

> *"an event that is beyond the control of the distributor and is:*
>
> *a) Unforeseeable;*
> *b) Unpredictable;*
> *c) Unpreventable; or*
> *d) Unavoidable.*
>
> *Such events disrupt normal business operations and occur so infrequently that it would be uneconomical to take them into account when designing and operating the distribution system. Such events cause exceptional and/or extensive damage to assets, they take significantly longer than usual to repair, and they affect a substantial number of customers. "Beyond the control of the distributor" means events that include, but are not limited to, force majeure events and Loss of Supply events."*[7]

WNP determines if a power outage should be classified and reported as a Major Event by following "The IEEE Standard 1366"[8] calculation of:

$$T_{MED} = e^{(\alpha + 2.5\beta)}$$

A Major Event Day (MED) is a day which the daily system SAIDI exceeds threshold value, T_{MED}. WNP calculates the daily SAIDI and any day where the daily SAIDI is greater than the threshold value T_{MED} that occurs during the subsequent reporting period is classified as a Major Event.

[7] Ontario Energy Board's "Electricity Reporting And Record Keeping Requirements Effective March 31, 2020".
[8] IEEE Std 1366-2020 – IEEE Guide for Electric Power Distribution Reliability Indices", Section 3.5 Major Event Day Classification

o Operational Effectiveness Indicators

The Public Safety measure is generated by the Electrical Safety Authority (ESA) and consists of three components as described below.

Component A - Public Awareness of Electrical Safety:

Component A involves a new statistical survey that gauges the public's awareness of key electrical safety concepts related to electrical distribution equipment located in WNP's service area. The survey also provides a benchmark of the levels of awareness including identifying gaps where additional education and awareness efforts may be required.

WNP retained a third-party organization to conduct the Electrical Safety Authority's Public Awareness safety survey. The utility considers this survey to be a useful tool to measure customer's knowledge of electrical safety as well as identifying areas that may require improvement.

Component B – Compliance with Ontario Regulation 22/04:

Component B is an evaluation of WNP's compliance with Ontario Regulation 22/04 – "Electrical Distribution Safety". Ontario Regulation 22/04 defines the safety requirements for the design, construction, and maintenance of electrical distribution systems, particularly in relation to the approvals and inspections required prior to putting electrical equipment into service.

An ESA audit of WNP is performed yearly by AESI to verify the organization's extent of compliance with Regulation 22/04, to identify any gaps, and to evaluate the effectiveness of procedures in place for compliance purposes. The audit covered the organization's existing processes. Standard auditing methods and procedures were used including interviews with personnel, examining documents and records and observing work in progress on a relevant sample of work activities.

Component C - Serious Electrical Incident Index:

Component C consists of the number of serious electrical incidents, including fatalities, which occur within a utility's territory.

o Planning Quality Indicators

Capital Expenditure (CapEx)

For each construction project, Operations (Engineering) prepare an accurate Job-Estimate detailing all the components required, fleet equipment and approximate labour hours including whether third-party services are required (e.g. hydrovac). The Job Estimate is reviewed by the CEO/President. The Finance Department track costs associated with the project. Once the job is completed, Operations sign-off the work order and review actual costs against the Job-estimate labour hours, materials and contracted services used. This process was implemented in 2015 and has improved the accuracy of future Job Estimates as well as identifying any productivity related issues.

WNP monitors its capital expenditure by comparing budget versus actual spent for each project. Information concerning capital expenditure spending compared to budget is presented to the LDC's Operations Committee which meets quarterly.

Operating Expenditure (OpEx)

Annual Operating Expenditure budgets are prepared by WNP in Quarter 4 of the preceeding year and presented to the Finance Committee in October for review. If the Finance Committee, consisting of WNP Management and Directors approve the budget, it is included at the next Board meeting for ratification by means of a Board Resolution. At each stage, the Finance Committee or Board meeting, the proposed Operating Budget can be rejected resulting in WNP staff preparing a revised budget. The proposed budget considers current spending levels, as well as inflation rate adjustments for vendor contractual agreements and labour agreements.

Implementation of the Distribution System Plan (DSP)

WNP's 2016 Cost of Service rate application (EB-2015-0110) included the utility's Distribution System Plan (DSP) containing the 5-year capital investment plan for the period 2016 to 2020. The DSP was accepted by all parties presiding over WNP's application with the annual CapEx budgets approved as noted in the table below:

Figure 19: DSP Approval – CapEx Budget 2016-2020

	2016	2017	2018	2019	2020	Total
DSP Budget Approved	$1,593,911	$768,670	$2,196,470	$951,850	$963,000	$6,473,901
DSP Actual	$1,545,545	$712,855	$2,229,731	$674,983	$281,910	$5,445,024
Variance between Actual to Budget	-3%	-7%	2%	-29%	-71%	-16%

* DSP Actual for 2020 is at May 31st 2020.

At the time of preparing this DSP, the OEB had not issued a methodology for measurement of implementation of an LDC's DSP.

o Financial Performance Indicators

As part of the OEB's scorecard, the financial performance of a utility is measured using three performance indicators:

a) Liquidity;
b) Leverage; and
c) Profitability

As described below, WNP's financial results meet or exceed the expectations of the energy regulator and demonstrate prudent management of the utility.

Liquidity: *Current Ratio (Current Assets/Current Liabilities)*

As an indicator of financial health, a current ratio indicates a company's ability to pay its short term debts and financial obligations. Typically, a current ratio between 1 and 1.5 is considered good. If the current ratio is below 1, then a company may have problems meeting its current financial obligations. If the current ratio is too high (higher than 1.5) then the company may be inefficient at using its current assets or its short-term financing facilities

Leverage: *Total Debt (includes short-term and long-term debt) to Equity Ratio*

The debt to equity ratio is a financial ratio indicating the relative proportion of shareholders' equity and debt used to finance a company's assets. The OEB uses a capital structure of 60% debt and 40% equity (a debt to equity ratio of 60/40 or 1.5) when setting rates for an electricity utility. A high debt to equity ratio indicates a utility may have difficulty generating sufficient cash flows to make its debt payments; while a low debt-to-equity ratio indicates that a utility is not taking advantage of the increased profits that may be had through increased financial debt.

Profitability: *Regulatory Return on Equity*

Return on Equity (ROE) measures the rate of return on shareholder equity. ROE demonstrates an organization's profitability or how well a company uses its investments to generate earnings growth. A ROE of 10% is generally considered good.

WNP's current distribution rates were approved by the OEB in 2016 with an expected (deemed) regulatory return on equity of 9.19%. The OEB allows a distributor to earn within +/- 3% of the expected return on equity. If a distributor performs outside of this range, it may trigger a regulatory review of the distributor's financial structure by the OEB.

- **CDM Program Targets and Performance**

In March 2019, the Minister of Energy, Northern Development and Mines directed the Independent Electricity System Operator (IESO) to discontinue the current 2015-2020 Conservation First Framework and implement a new interim framework, in support of the government's goal to reduce electricity costs for customers. The change means that the IESO will centrally deliver energy-efficiency programs on a province-wide basis with a focus on business and industrial programs beginning April 1, 2019 until December 31, 2020. Ontario businesses will continue to have access to incentives for retrofits and other energy-efficiency projects, and the Home Assistance program for low-income customers and conservation programming for Indigenous communities will continue.

5.2.3b Unit Cost Metrics

The total operating and capital investment costs for Ontario's local electricity distribution companies are evaluated by the Pacific Economics Group LLC (PEG) to produce a single efficiency ranking. The electricity distributors are divided into five groups based on the magnitude of the difference between their respective individual actual and predicted costs. The five efficiency groups are ranked as:

1. Excellent;
2. Good;
3. Average;
4. Fair; and
5. Poor.

For the reporting period 2015 to 2018, WNP was placed in Group 4 in terms of efficiency – i.e. the utility is defined as having actual costs between 10% to 25% above predicted modelled costs[9]. Group 4 is considered "fair", that is costs are slightly above the average cost range of all distributors in the Province of Ontario.

For the reporting year of 2019, WNP was placed in Group 3 in terms of efficiency – i.e. the utility having actual costs between -10% to 10% of the predicted modelled costs. Group 3 is rated as "average" meaning the utility's costs fall within the average cost range of all Ontario electricity distributors.

Although Wellington North Power Inc.'s forward looking goal is to advance to a "more efficient" group, management's expectation is that its' efficiency performance will not decline in the foreseeable future.

Efficiency Assessment

As part of the OEB's scorecard, operating efficiency and effectiveness of cost control of a utility is measured through two normalized indices:

a) Total Cost per Customer calculated by:

$$\frac{Capital\ Cost + Operating\ Expenses}{Total\ number\ of\ customers\ serviced\ by\ WNP}$$

b) Total Cost per km of line calculated by:

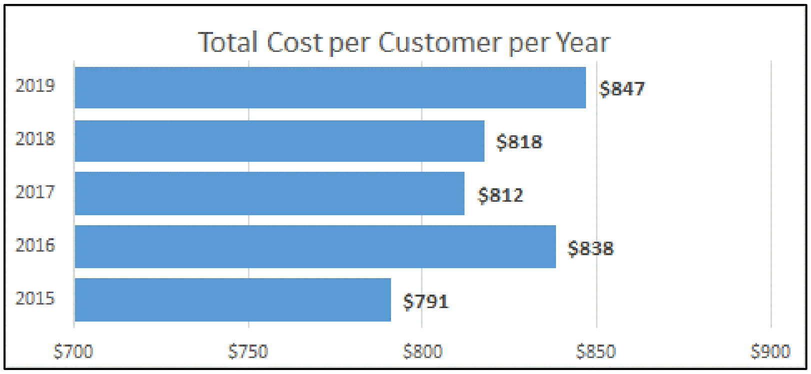
$$\frac{Capital\ Cost + Operating\ Expenses}{Kilometers\ of\ line\ maintained\ by\ WNP}$$

[9] Based on the econometric benchmarking analysis conducted by a third-party, Pacific Economics Group LLC appointed by the Ontario Energy Board using distributor reported information

a) Cost per Customer

The chart below illustrates WNP's "Cost per Customer" over the 5-year period 2015 to 2019:

Figure 20: Total Cost per Customer per Year



The table below summarizes the change in "Cost per Customer" over the 5-year period:

Figure 21: Reasons for Changes in Cost per Customer

Year	Reason for Cost Change
2016	The cost performance result for 2016 was $838 per customer which is a 5.9% change ($47 increase per customer per year) compared to 2015. This increase was predominately a result of significant capital expenditure for a major project completed in 2016 - the construction and energization of a new 2nd line 44kV feeder to Mount Forest to meet future electricity demand capacity requirements of our customers.
2017	The cost performance result for 2017 was $812 per customer which is a 3.1% reduction ($26 decrease per customer per year) compared to 2016. This reduction was predominately due to lower capital expenditure and lower operating costs in 2017 compared to 2016.
2018	The cost performance result for 2018 was $818 per customer which is a 0.7% increase ($6 increase per customer per year) compared to 2017. This slight increase is due to higher capital expenditure in 2018 compared to 2017.
2019	The cost performance result for 2019 was $847 per customer which is a 4% increase ($29 increase per customer per year) compared to 2018. This increase is due to increased OM&A expenses in 2019 compared to 2018.

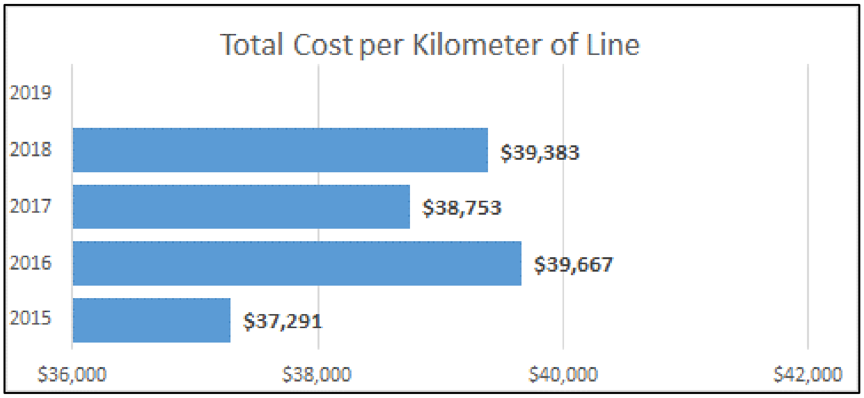
Similar to most distributors in the province, WNP has experienced increases in its total operating costs required to deliver quality and reliable services to customers. Investments in new information systems technology, cyber-security and labour cost adjustments for inflation for employees as well as the renewal of the distribution system have all contributed to increased operating and capital costs.

WNP's customer growth rate for its territory is considered to be relatively steady at less than 1% per year. The utility will continue to seek innovative solutions to help ensure cost per customer remains competitive and within acceptable limits to our customers.

b) Cost per Kilometer of Line

The chart below illustrates WNP's "Cost per Kilometer of Line" over the 5-year period 2015 to 2019:

Figure 22: Total Cost per Kilometer of Line



The table below summarizes the change in "Cost per Kilometer of Line" over the 5-year period:

Figure 23: Reasons for Changes in Cost per km of Line

Year	Reason for Cost Change
2016	The cost performance result for 2016 was $39,667 per kilometer of line which is a 2.3% change ($904 increase) compared to 2015. This increase was expected as noted in the utility's 2015 Scorecard "*the utility has planned for two major capital projects in 2016 and 2018, focusing on maintaining service reliability and increasing load capacity."* In 2016, this increase was a consequence of significant capital expenditure for a major project completed in 2016 - the construction and energization of a new 2nd line 44kV feeder to Mount Forest to meet future electricity demand capacity requirements of our customers.
2017	The cost performance result for 2017 was $38,753 per kilometer of line which is a 2.3% reduction ($914 decrease) compared to 2016. In this year, there were no "special" capital expenditures such as a sub-station replacement or 2nd line 44kV feeder.
2018	The cost performance result for 2018 is $39,383 per kilometer of line which is a 1.6% increase ($630 rise) compared to 2017. This slight increase is due to higher capital expenditure in 2018 compared to 2017 which included the replacement of an aged substation.
2019	The cost performance result for 2019 is $15,594 per kilometer of line which is a 60% decrease compared to 2018. This decrease is due to reporting increased km length of line as noted below.

<u>Length of line:</u>

WNP reported its' kilometer of line in 2015 as 76km; in 2016 an additional 3km of line was installed to connect to the new 44kV 2nd line feeder. For 2016-2018, the LDC reported 79 kilometers of line.

For 2019 annual data (filed in April 2020 RRR 2.1.4 submission), the utility reported to the OEB the length of primary overhead and underground lines (as per previous years) as well as the length of secondary overhead and underground lines. The inclusion of secondary line results in the total line length increasing from 79 km to 208 km

c) Cost, CapEx and O&M

As per the "Filing Requirements"[10], WNP has filed "Appendix 5-A" containing unit cost metrics for cost, CapEx and O&M. Below is a copy of Appendix 5-A showing the metrics:

Figure 24: Appendix 5-A

Metric Category	Metric	Measures	
		1 Year[4]	5 Year Average[5]
Cost	Total Cost per Customer[1]	$886	$821
	Total Cost per km of Line[2]	$16,444	$29,573
	Total Cost per MW[3]	$204,245	$185,074
CAPEX	Total CAPEX per Customer[6]	$389	$366
	Total CAPEX per km of Line	$7,220	$13,171
O&M	Total O&M per Customer	$497	$455
	Total O&M per km of Line	$9,224	$16,401

Notes:

1. Total Cost per Customer is the sum of capital and O&M costs divided by the total number of customers.
2. Total Cost per km of Line is the sum of capital and O&M costs divided by the total number of kilometers of line the distributor operates to serve its customers.
3. The Total Cost per MW is the sum of capital and O&M costs divided by the total peak MW of the distributor.
4. 1-Year values reflect the predicted 2021 Test Year values derived from the latest PEG (August 2020) from the "Forecasting 2019" worksheet to forecast values for 2020, 2021 and 2022.
5. 5-Year Average values are based on the averages of years 2015 to 2019 PEG model reported data.
6. Number of Customers excludes Street Lights, Unmetered Scattered Load and Sentinel Lighting.

The table below shows the calculations used to derive the metrics:

Figure 25: Calculations for Unit Cost Metrics

		2015	2016	2017	2018	2019	5-yr Average		2021
	PEG Model: OM&A Cost	$1,644,603	$1,732,025	$1,707,931	$1,702,863	$1,806,902	$1,718,865		$1,918,634
	PEG Model: Capital Cost	$1,301,376	$1,401,666	$1,353,571	$1,408,359	$1,436,725	$1,380,339		$1,501,659
	PEG Model: OM&A + Capital	$2,945,979	$3,133,691	$3,061,502	$3,111,222	$3,243,627	$3,099,204		$3,420,294
	# of metered customers	$3,725	$3,739	$3,770	$3,805	$3,830	$3,774		$3,862
	km of line	79	79	79	79	208	105		208
	Peak MW	17	16	16	17	17	17		17
Cost	Total Cost per Customer	$791	$838	$812	$818	$847	$821		$886
	Total Cost per km of line	$37,291	$39,667	$38,753	$39,383	$15,594	$29,573		$16,444
	Total Cost per MW	$169,709	$190,105	$186,893	$186,748	$192,557	$185,074		$204,245
CapEx	Total CapEx per Customer	$349	$375	$359	$370	$375	$366		$389
	Total CapEx per km of line	$16,473	$17,743	$17,134	$17,827	$6,907	$13,171		$7,220
O&M	Total O&M per Customer	$442	$463	$453	$448	$472	$455		$497
	Total O&M per km of line	$20,818	$21,924	$21,619	$21,555	$8,687	$16,401		$9,224

[10] Ontario Energy Board Filing Requirements for Electricity Distribution Rate Applications – 2020 Edition for 2021 Rate Applications- Chapter 5 Consolidated Distribution System Plan, Section 5.2.3 Performance Measurements for Continuous Improvement, item b), page 11

Included in "Appendix 5-A", WNP noted reasons for the variances in some of the metrics, namely:

- Inputs for "Appendix 5-A" 5-year average is taken from the published data of the Pacific Economics Group (PEG) benchmarking reports for performance years of 2015 to 2019[11].
- The Total Cost per Customer in 1 Year (2021) is above the 5-year average. This is because the 5-year average period of 2015-2019 was affected by:
  - Lower labour expenses in 2017 and 2018 with staff on maternity leave with positions either not back-filled or filled with a temporary contractor;
  - In 2018, there was an organizational restructure that resulted in the positions of the Chief Operating Officer and the Chief Administrative Officer being replaced by a CEO/President;
  - In 2015, 2016 and 2017 IT operating expenses were noticeably lower which influenced the 5-year average period.)From 2018 onwards, the utility has incurred additional expenses, such as retaining a Cybersecurity Officer/IT Consultant, required to prioritize and address the OEB's cyber-security framework issued in December 2017.)

  (Full details of the above items are discussed in Exhibit 4 of WNP's Cost of Service application.)
- The Total Cost per kilometer of line in the 1-year (Test Year) is lower than the 5-year average. This is because for 2019 data, the utility reported to the OEB the length of primary overhead and underground lines (as per previous years) as well as the length of secondary overhead and underground lines. The inclusion of secondary line results in the total line length increasing from 79 km to 208 km.

The utility's electrical distribution asset information is maintained in a central repository, Asset Management System (GIS), representing a single source of truth for the organization. This information is being further integrated across all functions, thus linking engineering, operational and financial information for all assets. This is further enhanced by a network connectivity model, which more accurately represents the impact of assets on one another. It is envisaged that by integrating this information across all functions of the utility, it will deliver cost-efficiencies by providing consistent and dependable data as well as reducing the duplication of data sources.

Inputs for "Appendix 5-A" 1-year forecast (2021 Test Year) are taken from the Pacific Economics Group (PEG) benchmarking report dated August 31st 2020 containing latest 2019 data. In the benchmarking workbook, WNP used the "Forecasting 2019" worksheet to predict the costs for 2021. The LDC adjusted the following parameters in the PEG Benchmarking model:

- Total Adjusted OM&A Expense: changed to 3.00% to align with OpEx projections for 2021.
- Gross Plant Additions: changed to -2.85% to align with the CapEx projection for 2021. In 2021, WNP's CapEx plan is $627,000.

[11] Based on the econometric benchmarking analysis conducted by a third-party, Pacific Economics Group (PEG), appointed by the Ontario Energy Board using distributor reported information

- Number of customers: used annual growth rate of 0.41% to align with WNP’s load forecast for 2021 of 3,862 customer accounts (metered customers).
- Distribution circuit: 0% to maintain the same km line length of 208 km (primary and secondary overhead and underground).
- Construction Cost Index: changed to 3% (from default of 5%).
- GDP IPI and Average Hourly Earnings Growth: changed to 2% (from default of 5%).
- Average Hourly Earnings Growth: changed to 2% (from default of 5%).
- Return on Equity: applied 6.02% (as per 2019).

5.2.3c Summary of Historical Performance

o Customer Service Quality Indicators

The table below illustrates the performance of the service quality indicators for WNP for the period 2015 to 2019.

Figure 26: Service Quality Indicators - 5-year Historic Performance

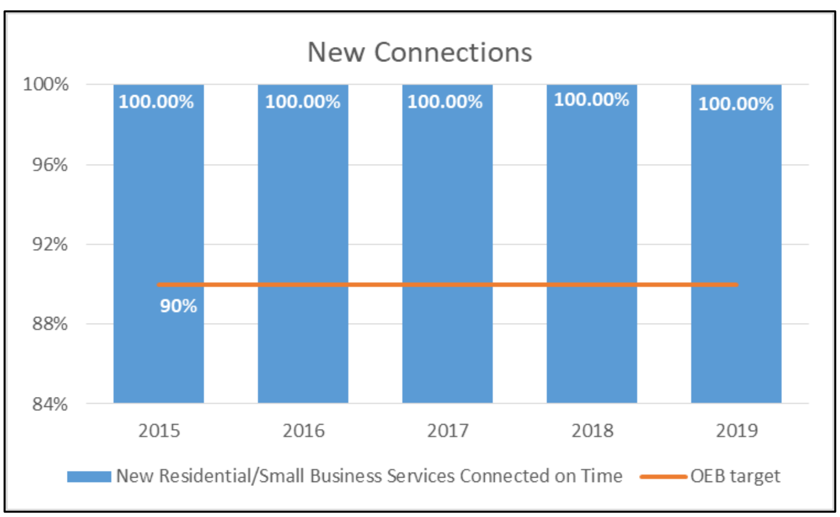
Indicator	OEB Minimum Standard	2015	2016	2017	2018	2019
Low Voltage Connections	90.0%	100.00%	100.00%	100.00%	100.00%	100.00%
Appointment Scheduling	65.0%	98.60%	99.70%	100.00%	99.53%	99.37%
Appointments Met	90.0%	95.60%	98.98%	99.42%	99.09%	98.11%
Rescheduling a Missed Appointment	80.0%	100.00%	100.00%	100.00%	100.00%	100.00%
Telephone Accessibility	80.0%	100.00%	99.92%	99.72%	99.00%	99.00%
Telephone Call Abandon Rate	80.0%	0.00%	0.00%	0.00%	0.00%	0.04%
Written Response to Enquires	10.0%	100.00%	100.00%	100.00%	96.95%	97.35%
Emergency Response - Urban	90.0%	100.00%	100.00%	100.00%	100.00%	100.00%
Reconnection Performance Standard	85.0%	100.00%	100.00%	100.00%	100.00%	100.00%

Over the last 5-years, WNP has met or exceeded the requirements prescribed by the OEB for each customer service quality indicator listed in Figure 26 (above).

Connection of New Services:

For the 5-year period of 2015-2019, WNP connected 100% of all new low voltage services requests within 5 business days, exceeding the OEB's minimum requirements as shown in the chart below:

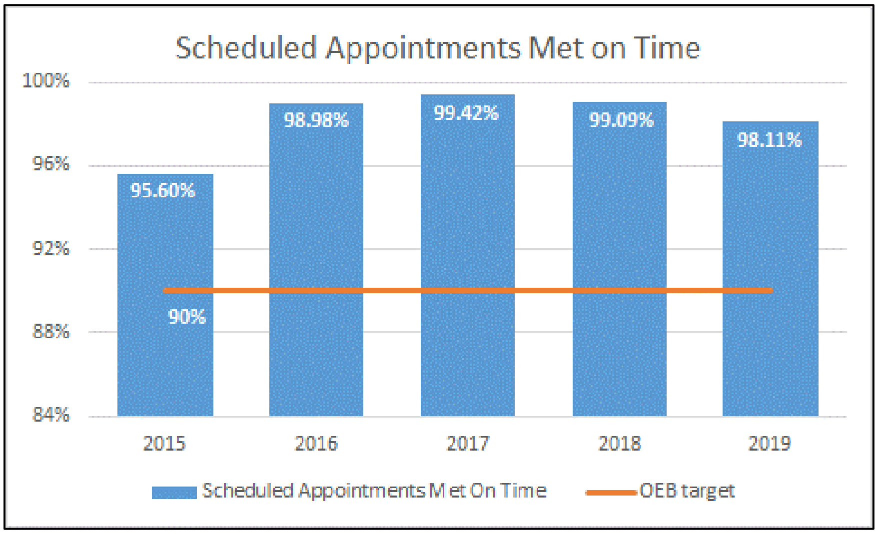
Figure 27: New Low Voltage Connections Connected on Time



Scheduled Appointments Met:

For the 5-year period of 2015-2019, WNP's performance for meeting scheduled appointments within the 4-hour timeframe exceeded the OEB's minimum requirements as shown in the chart below:

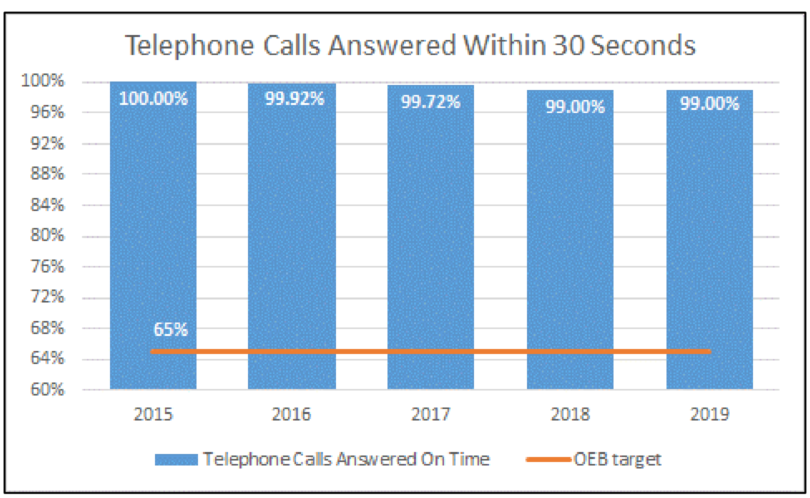
Figure 28: Scheduled Appointments Met on Time



Telephone Accessibility

For the 5-year period of 2015-2019, WNP telephone answer-rate for qualified calls exceeded the OEB's minimum requirements as shown in the chart below:

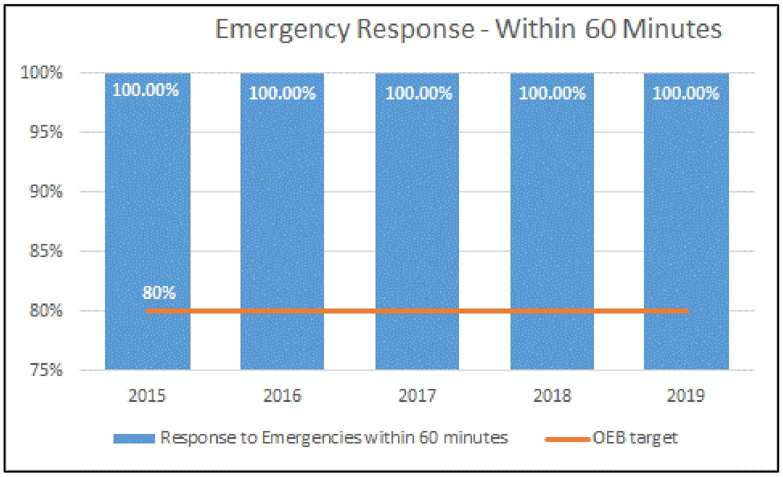
Figure 29: Telephone Calls Answered within 30 Seconds



Response Time To Emergencies

For the 5-year period of 2015-2019, WNP's response to all emergencies was at or below the 60-minute expectation of the OEB as shown in the chart below:

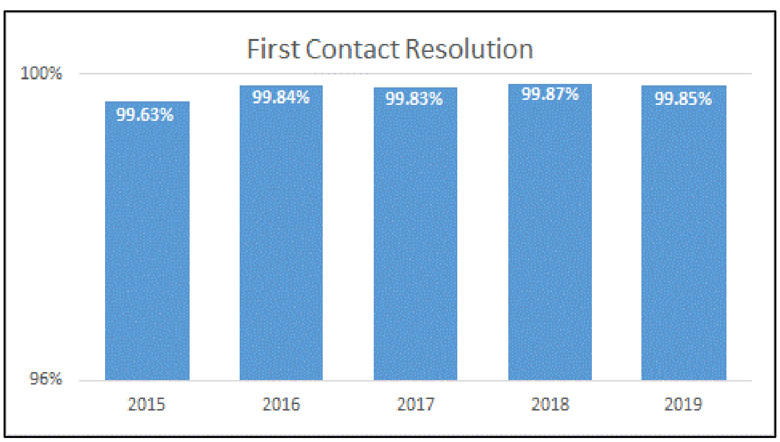
Figure 30: Emergency Response Incidents – Arrival within 60-minutes



First Contact Resolution

For the 5-year period of 2015-2019, WNP's response to customer enquiries were handled by the first contact at the utility in over 99% of instances as shown in the chart below:

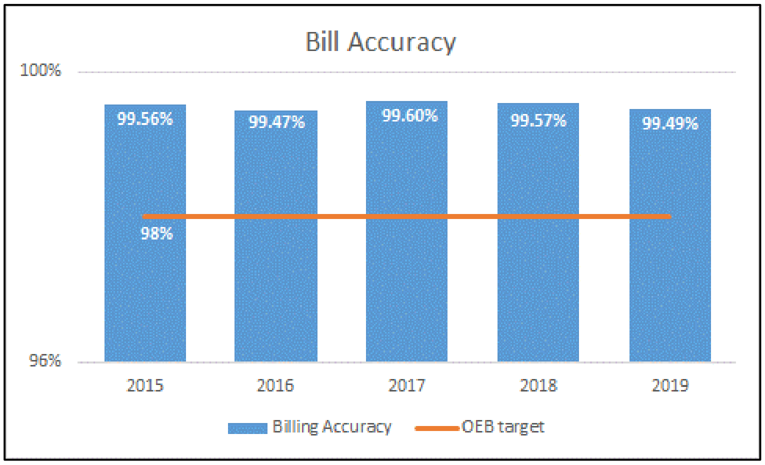
Figure 31: First Contact Resolution



Billing Accuracy

For the 5-year period of 2015-2019, billing accuracy was above the OEB's target as shown in the chart below:

Figure 32: Billing Accuracy



Customer Satisfaction Survey - OEB-mandated

The table below illustrates the Customer Satisfaction results for OEB-mandated bi-annual customer satisfaction surveys carried out on WNP's customers in 2016 and 2018:

Figure 33: Customer Satisfaction Survey

Year of Survey	Satisfaction Score	Survey Sample Size
2016	79.00%	*N=300*
2018	81.10%	*N=300*

Customer Satisfaction Survey – LDC Initiated

The chart below shows the satisfaction results for completed Work Orders:

Figure 34: Completed Work Orders - Customer Satisfaction

	2016	2017	2018	2019
Total Work Orders Completed	1,136	1,205	1,281	1,313
# of Customers Contacted	176	124	127	135
% of Customers Contacted from Completed Work Orders	15%	10%	10%	10%
# of Customers Satisfied with Work Completed by WNP	*127*	*85*	*91*	*96*
	72%	69%	72%	71%
# of Customers Not Satisfied with Work Completed by WNP	*0*	*0*	*0*	*0*
	0%	0%	0%	0%
# of Customers who did not want to provide a satisfaction rating	*49*	*39*	*36*	*39*
	28%	31%	28%	29%

o System Reliability & Performance

The utility, as per OEB requirements, records power outages by the following methods:

a) "All Losses" includes all power outages and interruptions.

b) "Excluding Loss of Supply" measures power outages with the exclusion of interruptions caused by a "loss of supply". As an embedded distributor, WNP is fed from transmission and distribution network lines owned and maintained by Hydro One Networks Inc. - is known as "loss of supply" or "upstream supply". Outages as a result of losing loss of supply are removed from this method.

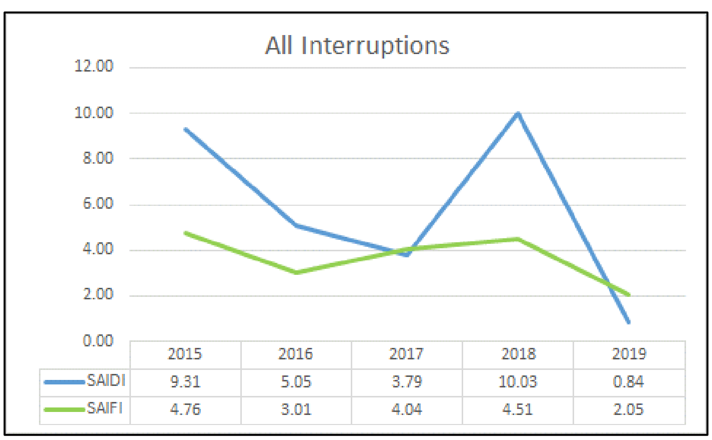
c) "Loss Adjusted" power outages are caused by events other than "Loss of Supply" or a "Major Event". Loss adjusted power outages can be as a result of a planned power outages to enable the utility to work safely on the distribution system; tree contacts on distribution lines; lightning or adverse weather; defective equipment; and animal or human contact with distribution equipment such as a motor vehicle colliding with a hydro pole.
(A "Major Event" is something beyond the control of the utility and is unforeseeable, unpredictable, unpreventable or unavoidable. Examples of a major event include a snow-storm, ice-storm, a tornado or strong winds.)

Detailed below is the system reliability performance for WNP for the period 2015 to 2019 for each reporting method:

a) All Losses – SAIDI and SAIFI.

Figure 35 illustrates the System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) for "all losses" experienced by WNP and its' customers over the historical period of 2015 to 2019:

Figure 35: All Losses – SAIDI and SAIFI Performance for WNP



The table below summarizes all causes of power interruptions experienced by WNP customers for the period 2015 to 2019:

Figure 36: All Causes of Power Interruptions (2015-2019)

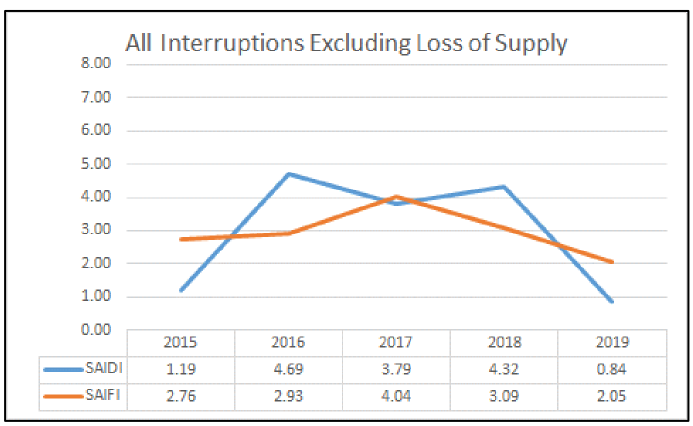
		2015		2016		2017		2018		2019	
Code	Description	Total Customers Affected	Total Customer Hours	Total Customers Affected	Total Customer Hours	Total Customers Affected	Total Customer Hours	Total Customers Affected	Total Customer Hours	Total Customers Affected	Total Customer Hours
1	Scheduled	154	146.87	346	209.72	529	276.17	248	187.12	291	199.80
2	Loss of Supply	17,728	34,856.75	10,230	16,330.52	14,745	14,028.70	10,554	15,919.37	7,115	2,288.58
3	Tree Contact	0	0.00	28	7.93	1	1.00	1	6.30	1	1.57
4	Lightning	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
5	Defective Equipment	30	42.97	54	55.37	38	36.32	875	247.70	40	84.63
6	Weather	10	12.33	609	2,216.20	22	40.17	92	114.70	48	244.27
7	Adverse Environment	0	0.00	0	0.00	0	0.00	12	2.23	0	0.00
8	Human Element	6	1.50	1	94.67	0	0.00	0	0.00	0	0.00
9	Animal	2	8.53	1	0.98	9	20.33	42	41.32	0	93.32
10	Other	16	26.02	1	0.17	1	0.03	0	0.00	356	305.37
	Major Event			0.00	0.00	0.00	0.00	5,417	21,875.83	0.00	0.00
	Total	17,946	35,095	11,270	18,916	15,345	14,403	17,241	38,395	7,851	3,218

As illustrated in the table above, the majority of power interruptions over the historical period have been caused by loss of supply. In 2018, the “Major Event” was a loss of supply occurring on August 29th and September 1st – this is discussed below.

b) Excluding Loss of Supply - SAIDI and SAIFI.

Figure 37 illustrates the System Average Interruption Duration Index (SAIDI) and System Average Interruption Frequency Index (SAIFI) for losses/power interruptions that are not as a consequence of a “Loss of Supply” over the period of 2015 to 2019:

Figure 37: Excluding Loss of Supply – SAIDI and SAIFI Performance for WNP

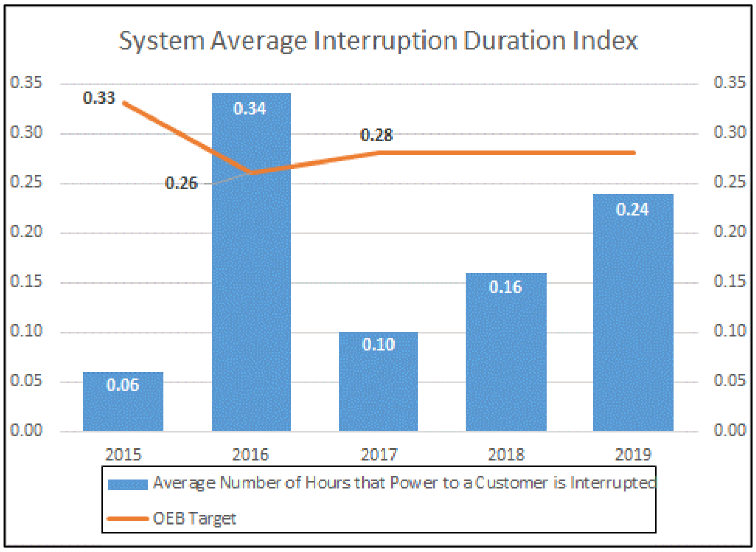


c) Loss Adjusted (excluding Loss of Supply and Major Events).

System Average Interruption Duration Index ("SAIDI")

WNP's 5-year historical performance is currently 0.28 average hours based on the utility's average SAIDI for years 2011 to 2015. Figure 38 illustrates WNP's adjusted SAIDI values for the period 2015 to 2019 plotted against the 5-year historical performance (OEB's expected target for the utility)[12].

Figure 38: Adjusted SAIDI Performance for WNP



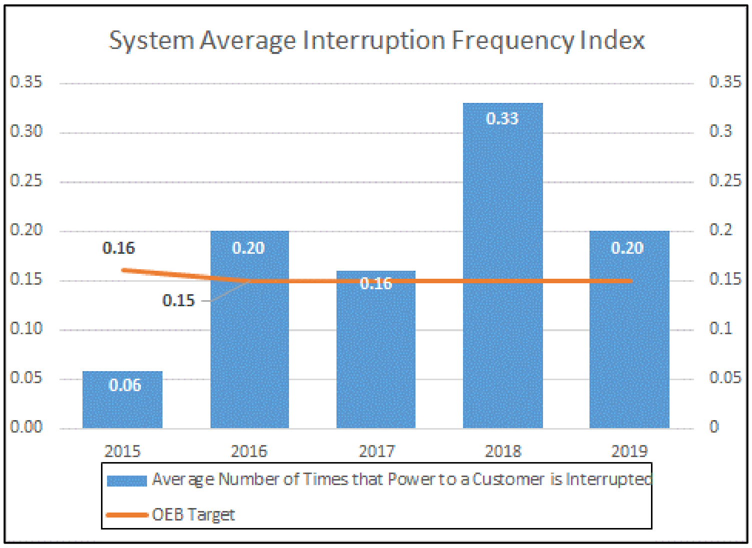
In 2016, Wellington North Power Inc. achieved 0.34 average hours of interrupted power which is above the utility's target of 0.26 average hours. The 2016 above-target result was predominately due to a major capital project of a new 2nd line 44kV feeder in Mount Forest which required more planned power outages than prior years to safely complete pole-line construction work. For all other years, WNP's SAIDI performance has been below the OEB's target.

[12] OEB Target: 2015 target was the average reported SAIDI for 2010-2014 (i.e. 0.33); 2016-2020 target was the average reported SAIDI for 2010-2014 with the removal of Major Events during this period.

System Average Interruption Frequency Index ("SAIFI")

Figure 39 illustrates WNP's adjusted[13] SAIFI values for the period 2015 to 2019 plotted against the 5-year historical performance (OEB's expected target for the utility)[14]. WNP's 5-year performance is currently 0.15 times based on the utility's average SAIFI for years 2011 to 2015.

Figure 39: Adjusted SAIFI Performance for WNP



As noted previously, the 2016 above-target result was predominately due to a major capital project of a new 2nd line 44kV feeder in Mount Forest which required more planned power outages than prior years to safely complete pole-line construction work.

In 2018, WNP experienced interrupted power 0.33 times which is above the range of the utility's 5-year average SAIFI performance of 0.15. This frequency of increased power outages was primarily a consequence of:

- On 12th April 2018, there were unplanned power outages due to distribution equipment failure that affected approx. 25% of our customers.
- Planned projects, such as pole-line replacement in a residential area, will result in residential customers experiencing a brief power outage to enable crews to work safely rather than work on a "live system". WNP counts each residential property individually when there is a power-outage.

For 2019, WNP's SAIFI was 0.20 times which is marginally above the range of the utility's 5-year average SAIFI performance of 0.15. Again, this frequency of increased power outages was primarily a

[13] Adjusted = Power outages due to Loss of Supply (HONI) and Major Events are not included in the SAIDI calculation.
[14] OEB Target: 2015's target was the average reported SAIDI for 2010-2014 (i.e. 0.16); 2016's target was the average reported SAIDI for 2010-2014 with the removal of Major Events during this period (i.e. 0.15) as required as per the OEB's letter March 13, 2017 "Reporting of Customer Interruptions Data Related to Major Events")

consequence of planned projects, such as pole-line replacement in a residential area, will result in residential customers experiencing a brief power outage to enable crews to work safely rather than work on a "live system". WNP counts each residential property individually when there is a power-outage.

Major Events

Since the introduction of Major Event reporting by the OEB, WNP has experienced 3 major events as summarized below:

Figure 40: Major Events (2016-2019)

Date	Cause	Customers Interrupted	Total Customer Hours of Interruption	SAIDI (in minutes)	T_{MED}	MERR Filed
March 25th 2016	Weather	284	1,321	21.16	15.76	No
August 29th 2018	Loss of Supply	2,702	14,636	229.10	13.64	Yes
September 1st 2018	Loss of Supply	2,715	7,240	113.15	13.64	Yes

Notes:

i. March 25th 2016: A Major Event Response Reporting (MERR) was not filed with the regulator as this event occurred before the OEB released the MERR reporting requirements on May 3rd 2016.
The ice-storm that occurred on the evening of March 24th 2016 and into the early hours of March 25th 2016 was reported over the two separate dates. The storm resulted in 2,198 total customer hours of interruption and affected 602 customers (approx. 16% of WNP's customer-base). The SAIDI (in minutes) for March 24th 2016 was 14.05 which is below the T_{MED} threshold of 15.76.

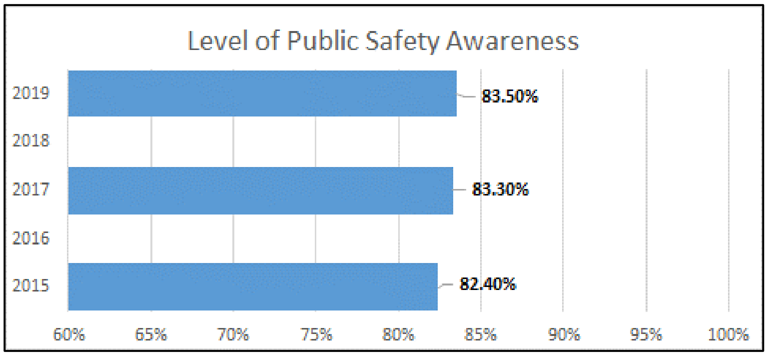
ii. T_{MED} is based on the average daily SAIDI of the previous 5 years. (For instance, 2016's T_{MED} is based on the average daily SAIDI for years 2011 to 2015).

o Operational Effectiveness

Component A - Public Awareness of Electrical Safety:

The chart below summarizes the results of the public awareness surveys conducted by WNP:

Figure 41: Public Awareness (2016-2019)



Component B – Compliance with Ontario Regulation 22/04:

Regarding Compliance with Ontario Regulation 22/04", annual audits conducted by the Electrical Safety Authority have reported that Wellington North Power Inc. was "C" - Compliant with Ontario Regulation 22/04 (Electrical Distribution Safety). This has been achieved and maintained by our resilient commitment to safety coupled with the adherence to company procedures & policies.

The results of the last four audits are included in the table below:

Figure 42: ESA Ontario Regulation 22/04 Compliance Audits

Audit Year	Non-Compliance	Opportunity for Improvement
May 1, 2015 to April 30, 2016	0	0
May 1, 2016 to April 30, 2017	0	0
May 1, 2017 to April 30, 2018	0	0
May 1, 2018 to April 30, 2019	0	0

WNP will continue to construct and maintain the electrical distribution system in accordance with the safety standards set-out by the Ontario Regulation 22/04 code. This activity is a clear demonstration of WNP's "Operational Effectiveness" (a RRFE defined outcome) to comply with ESA audits and maintaining a safe and reliable cost-effective distribution system.

Component C - Serious Electrical Incident Index:

Over the 5-year period of 2015 to 2019, WNP has had zero fatalities and zero serious incidents within its operating service area of the urban areas of Arthur, Holstein and Mount Forest.

o Planning Quality Indicators

Capital Expenditure (CapEx)

Figure 43 below summarizes the variances between WNP's actual expenditure from the utility's approved budget expenditure.

Figure 43: Planning Quality Indicators

		2015	2016	2017	2018	2019	5-yr Average
Capital Expenditure	DSP-Approved Budget		$1,593,911	$ 768,670	$2,196,470	$ 951,850	$ 1,254,180
	WNP-Board Approved Budget	$ 760,000					
	Actual	$ 798,438	$1,545,545	$ 712,855	$2,229,731	$ 674,983	$ 1,192,310
	% Variance to Approved Budget	5.06%	-3.03%	-7.26%	1.51%	-29.09%	-4.93%
		2015	2016	2017	2018	2019	5-yr Average
OM&A Expenditure	OEB-Approved Budget		$1,720,000				$ 1,735,000
	WNP-Board Approved Budget	$ 1,750,000					
	Actual	$ 1,659,199	$1,741,045	$1,714,355	$1,709,387	$1,815,812	$ 1,727,960
	% Variance to Approved Budget	-5.19%	1.22%	-0.33%	-0.62%	5.57%	-0.41%

WNP's yearly actual CapEx spending has tracked closely to its' Approved budget, with a mean average variance of less than 5% over the 5-year period. A summary of the notable variances include:

Figure 44: Summary of Variances: CapEx Actual to CapEx Approved Budget

2015	o Overage due to: a) Pole-line extension project requiring a new transformer which was not included in the job-estimate for the project. b) Unplanned replacement of Primary Metering Equipment (PME) because PME meter failed. c) Unplanned software upgrade of the Quadra job-estimating tool.
2017	o Project cancelled: Replacement of an AMI (Advanced Metering Infrastructure) server did not happen; instead the physical server was replaced with a virtual hosted server solution and charged as a monthly operating expense rather than a CapEx item. o Under budget: Replacement of office printer/fax/scanning machine.
2019	o Deferral: Replacement of a 2008-model year single bucket truck was deferred until 2020.

Operating Expenditure (OpEx)

WNP's yearly actual OpEx spending has tracked closely to the Approved OM&A (Operations, Maintenance & Administration) a mean average variance of less than 1% over the 5-year period. The variances are predominately due to[15]:

Figure 45: Summary of Variances: OpEx Actual to OpEx Approved Budget

2015	Retirement of CEO/President occurred earlier than planned. The positon was not back-filled.
2017 & 2018	Customer Service Representative (CSR) on maternity leave (12 months); position was covered by existing employees (no new staff hired) resulting in lower labour costs.

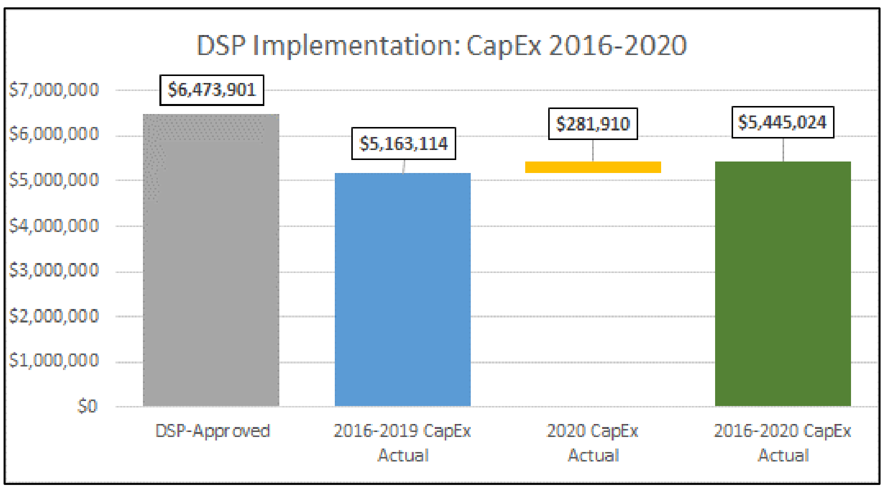
[15] Details of OpEx variances are included in Exhibit 4 of the utility's Cost of Service Rate Application (EB-2020-0061)

2018	CSR employee leaving the company; the position was not back-filled, therefore reducing number of employees from 13 to 12 resulting in lower labour costs.
2018 & 2019	CSR taking maternity leave (18 months); a new employee was hired on a 12-month contract to cover the CSR position.
2018	Quarter 4 onwards: retained a consultant as Chief Information Officer (CIO) to assess the utility's Information Technology infrastructure, reduce the IS risk profile by implementing IS controls and policies in accordance with the OEB's cyber-security framework.
2019	Introduction of a Service Level Agreement with the utility's IT partner (external third-party company) with fixed monthly fees for services including data/system back-up; server and workstation scanning & monitoring for viruses or cyber-threats; and firewall monitoring.

Implementation of the Distribution System Plan (DSP)

The charts below illustrates WNP's progress in implementing its DSP that was approved as part of the utility's 2016 Cost of Service rate application (EB-2015-0110).

Figure 46: DSP Implementation – Actual CapEx 2016-2019 and Planned CapEx 2020



* 2020 CapEx Actual is as at May 31st 2020.

Figure 47: DSP Implementation Progress

	DSP Approved CapEx	Annual CapEx Spent	Incremental Total CapEx Spent	DSP Implementation
2016-2020 CapEx Approved	$6,473,901			
2016 CapEx Spent - Actual		$1,545,545	**$1,545,545**	24%
2017 CapEx Spent - Actual		$712,855	**$2,258,399**	35%
2018 CapEx Spent - Actual		$2,229,731	**$4,488,131**	69%
2019 CapEx Spent - Actual		$674,983	**$5,163,114**	80%
2020 CapEx - Planned		$281,910	**$5,445,024**	84%

As at May 31st 2020, WNP had spent 84% of the DSP-approved budget.

WNP's DSP for the period 2016 to 2020 included the following significant capital investment projects:

- **2016: Construction of 2nd line 44kV feeder.**
  DSP Budget: $1,373,217; Actual CapEx $1,276,366.
  WNP worked with Hydro One Networks Inc. (HONI) to address capacity concerns with the electrical supply to the town of Mount Forest. The solution was to build approximately 11 kilometers of pole line to connect a 44kV feeder from Palmerston TS to WNP's distribution system. The project received approval from the OEB and Intervenors who presided over WNP's 2016 Cost of Service rate application (EB-2015-0110) and was planned to be started and completed during 2016. The 2nd line 44kV feeder was energized and in-service in December 2016.
- **2018: Replacement of an Aged Substation.**
  DSP Budget: $1,700,000; Actual CapEx $1,692,893.
  This capital expenditure was necessary to replace an existing substation (MS3 in Mount Forest) with a new 44kV 5 MVA Substation. This expenditure supported WNP's business objectives of prudent and sustainable investments in business system performance and reliability; public and employee safety; and regulatory compliance. Furthermore, this expenditure met the asset end-of-life replacement and long term planning requirements of the utility. The old MS3 substation was decommissioned and torn down in 2018; the new MS3 substation was assembled, energized and in-service in 2018 as planned.

Implementation of the Distribution System Plan (DSP) by OEB Investment Category

The table below compares the DSP-Approved plan to the Actual CapEx by OEB investment category as at May 31st 2020:

Figure 48: DSP Implementation Progress – Planned versus Actual by Investment Category

DSP Approved:	2016	2017	2018	2019	2020	**Total**
System Access	$55,000	$240,000	$240,000	$240,000	$60,000	
System Renewal	$90,000	$390,000	$1,932,000	$290,000	$450,000	
System Service	$1,373,217	$0	$0	$0	$0	
General Plant	$75,694	$138,670	$24,470	$421,850	$453,000	
Total	**$1,593,911**	**$768,670**	**$2,196,470**	**$951,850**	**$963,000**	**$6,473,901**
Cumulative Total	25%	36%	70%	85%	100%	

Actual CapEx:	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Actual 2020	**Total**
System Access	$38,722	$77,353	$140,741	$63,630	$24,571	
System Renewal	$113,170	$454,353	$2,012,186	$475,616	$67,051	
System Service	$1,307,297	$10,954	$54,500	$5,180	$1,377	
General Plant	$86,356	$170,195	$22,304	$130,557	$188,911	
Total	**$1,545,545**	**$712,855**	**$2,229,731**	**$674,983**	**$281,910**	**$5,445,024**
Cumulative Total	24%	35%	69%	80%	84%	

The table below illustrates the variance in capital expenditure between the DSP-Approved plan to the Actual CapEx as at May 31st 2020:

Figure 49: DSP Implementation Progress – Planned versus Actual Variance

DSP Approved:					
	2016	2017	2018	2019	2020
Total	**$1,593,911**	**$768,670**	**$2,196,470**	**$951,850**	**$963,000**
Cumulative Total	25%	36%	70%	85%	100%
Actual CapEx:	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Actual 2020
Total	**$1,545,545**	**$712,855**	**$2,229,731**	**$674,983**	**$281,910**
Cumulative Total	24%	35%	69%	80%	84%
Variance: Actual to Budget					
	2016	2017	2018	2019	2020
Total	-3%	-7%	2%	-29%	-71%
Variance: Actual to Budget					
	2016	2017	2018	2019	2020
Total	**-$48,367**	**-$55,815**	**$33,261**	**-$276,867**	**-$681,090**

The table below summarizes reasons where there was a material variance of $50,000 or more in a year (2016 to 2019) between the DSP-Approved Budget and the Actual CapEx for an OEB investment category:

Figure 50: Material Variances $50,000 + by OEB Investment Category

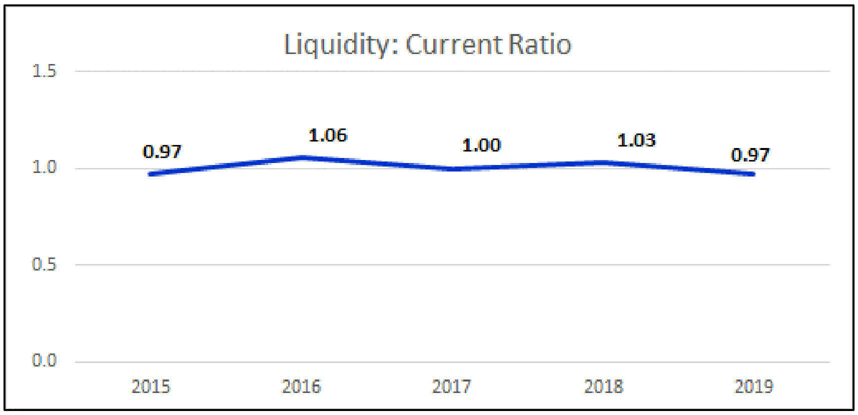
	OEB Investment Category			
CapEx Year	**General Plant**	**System Access**	**System Renewal**	**System Service**
2016				2nd 44kV feeder completed under budget
2017		Residential & Small Business Smart meter replacement project: meters were not replaced but sampled tested, resealed and recertified. Project reclassified from System Access to System Renewal.		
2018		Residential & Small Business Smart meter replacement project: meters were not replaced but sampled tested, resealed and recertified. Project reclassified from System Access to System Renewal.		
2019	Deferral: replacement of a 2007-model year single bucket truck.	Residential & Small Business Smart meter replacement project: meters were not replaced but sampled tested, resealed and recertified. Project reclassified from System Access to System Renewal.		

o Financial Performance Indicators

Liquidity: *Current Ratio (Current Assets/Current Liabilities)*

The chart below summarizes WNP's Liquidity performance over the past 5 years:

Figure 51: Liquidity Performance – Current Ratio



Over the 5-year reporting period, WNP's current ratio has remained at approximately 1.0 which is considered good.

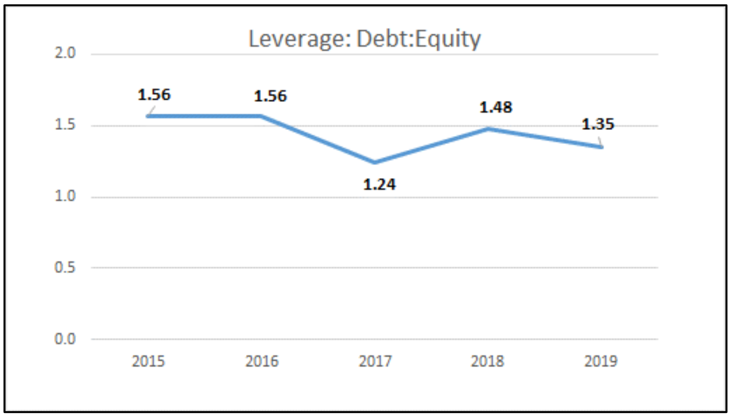
In 2015, WNP's current ratio was less than 1.0. WNP completed a major capital investment project in 2014 (replacement of an "old" substation.) The utility applied for a loan to finance this capital project and, although the financial institution approved the loan amount in early December 2014, the funds were not transferred until March 2015. Consequently, WNP had to draw on its' own assets ("cash") and incurred short-term debt, therefore WNP's cash position at the end of 2014 / opening 2015 was lower than in previous years, therefore affecting the company's current ratio.

Approximately $330,000 of invoices were paid in 2019 for a major capital project, the replacement of a substation that was completed in 2018. WNP secured a loan to pay for the new substation which was procured in 2018; consequently, liquidity was higher in 2018 and went down in 2019 when the money was disbursed.

Leverage: *Total Debt (includes short-term and long-term debt) to Equity Ratio*

The chart below summarizes WNP's Leverage performance over the past 5 years:

Figure 52: Leverage Performance – Current Ratio

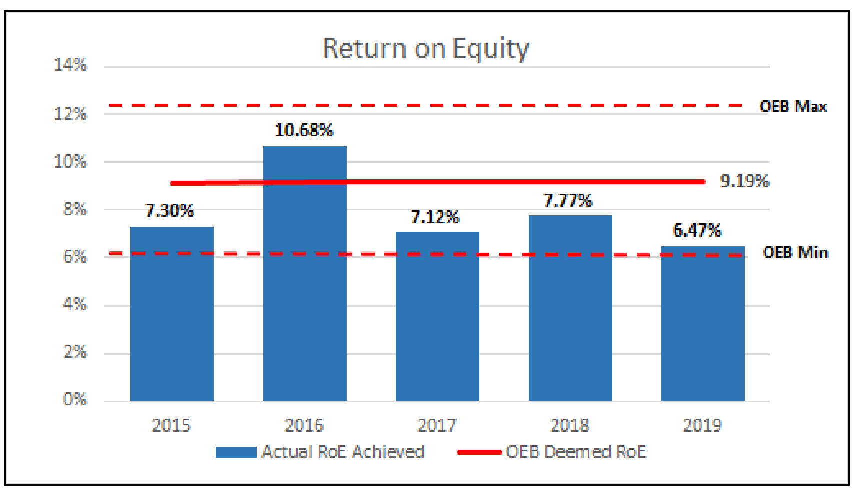


WNP's Debt-to-Equity (Leverage ability) has been consistent over the past 5 years operating at approximately the ratio of 1.5 as expected by the OEB. In 2017, lower Leverage ratio represented smaller short-term loans at the end of the year and no new financing loans required in the year. In 2018, the utility secured a financing loan to fund the replacement of an aged substation.

Profitability: *Regulatory Return on Equity (ROE)*

As shown below, WNP has achieved a steady ROE over the 5-year reporting period and within the OEB's prescribed range[16] recognizing good cost-control and budgetary practices:

Figure 53: WNP's Return on Equity (RoE)



[16] 2016's RoE included regulatory revenue earned from prior years that, with OEB approval and direction, was realized in the utility's 2016 Audited Financial Statements. This regulatory revenue accounted for approx. 3.3% of 2016's ROE of 10.68%.

o CDM Program Targets and Performance

The chart below illustrates WNP's CDM performance under the 2015 to 2020 Conservation First Framework (CFF) Program from January 2015 to March 2019:

Figure 54: CFF Program Results – kWh Energy Savings

	CFF Target 2015-2020	Annual kWh Savings Target	Annual kWh Savings Achieved	Cumulative kWh Savings	kWh Savings Achieved Compared to CFF Target
2015	5,890,000	981,667	792,131	792,131	13%
2016		981,667	580,997	1,373,128	23%
2017		981,667	833,281	2,206,409	37%
2018		981,667	632,802	2,839,211	48%
2019		981,667	36,510	2,875,721	49%
2020		981,667			
Total		**5,890,000**	**2,875,721**		

Notes regarding the above table:

a) Results for 2015 to 2017 are from the IESO's "Final Verified LDC CDM Program Results" report.
b) Results for 2018 and 2019 are unverified savings from the IESO's "Participation & Cost" report.

In 2019, WNP completed a streetlight conversion project, replacing the high pressure sodium (HPS) lights with light emitting diode (LED) in the LDC's service areas Arthur and Mount Forest. This LED project was included in the LDC's CFF budget for 2019 and was completed in November 2019; however, the CDM savings results are not available from the IESO and therefore not included in the energy-savings noted in the above table.

WNP has obtained M&V analysis from a third-party, The Power Factory, which shows the energy savings as a result of the LED streetlight conversion. A copy summary of the M&V analysis is represented in the figure below:

Figure 55: LED Streetlight Conversion M&V Report

Wellington North - Arthur and Mount Forest Street Lighting Project

M&V Analysis

TPF ENERGY SERVICES.NET

Base Case

784 High Pressure Sodium Streetlights
of which 39 >250W, 747 < 250W
Lights operate on average 12h per day, 365 days per year

	Electricity (kWh)
Base Case	574,047
EE Case	164,666
Savings	409,381

EE Case

786 LED street lights (RFM-72W32LED4K-G2)
of which 39 are set at 100%, the rest are set at 50% and 75% of lumens
Lights operate on average 12h per day, 365 days per year

	Qty					
	289	490	3	2	Theoretical kW	Annual kWh
Base Case Wattage	130	188	457	1100	131	574,047
Hours						4380
EE Case Wattage	36.5	54.75	73	73	38	164,666

5.2.3d Historical Performance of Indicators Affecting DSP

- **Customer Service Quality Indicators**

Over the 5-year historical period of 2015 to 2019, WNP has met or exceeded the requirements prescribed by the OEB for each customer service quality indicator.

In this DSP, WNP are proposing no investments to further improve the performance of the LDC for fulfilling these service quality indicators.

- **System Reliability & Performance**

Over the 5-year historical period of 2015 to 2019, WNP's Adjusted SAIDI and SAIFI (i.e. removal Loss of Supply and Major Events) have been tracking close to or below the 5-year targets, with the exception of the years 2016 (SAIDI) and 2018 (SAIFI) due to the circumstances as described. The LDC has received no complaints from customers concerning service reliability.

Taking into consideration the customer feedback from the Customer Surveys received concerning the reliability of utility's distribution system (refer to Section 5.2.2 - Coordinated Planning with Third Parties), WNP does not need to invest in a major overhaul of its system. Reliability is not currently being noted as a concern to customers and therefore, WNP should continue to invest in maintaining the reliability of its' distribution system.

In this DSP, WNP are proposing no investments to further improve the performance of the LDC's SAIDI or SAIFI performance.

- **Operational Effectiveness Indicators**

In this DSP, WNP are proposing no investments to further improve the performance of the LDC's operational effectiveness indicators.

- **Planning Quality Indicators**

WNP's opinion is that the utility has demonstrated a reasonable approach to monitoring and pacing of capital expenditures to minimize the impact on rates. For instance, in 2016 and 2018, the LDC completed significant capital investments projects (2nd line 44kV feeder and replacement of a substation) which were energized and in-service on time and within budget. During these years, WNP capital plan was prioritized to move discretionary capital projects into other years so as to minimize total capital expenditure, therefore minimizing impact on rates.

Taking into consideration the customer feedback from the Customer Surveys received concerning investment planning priorities (refer to Section 5.2.2 - Coordinated Planning with Third Parties), “Maintaining and upgrading equipment” was the number one “High Priority statement as rated by Residential and Small Business customers. WNP needs to continue with its capital investment that maintains the reliability of the distribution system at a pace that does not excessively increase hydro-rates year-over-year.

In its’ Capital Plan for the forecasted period of 2021-2025 included in this DSP, WNP is continuing with a planned and paced approach to capital investments. There are no “special projects” (i.e. substation replacement) planned during the forecast period with average yearly capital expenditure “levelized” at approx. $575,000 (this average amount excludes the expenditure for a bucket truck replacement in 2022).

o Financial Performance Indicators

Liquidity: Looking ahead, WNP expects to maintain a current ratio between 1 to 1.5.

Leverage: Looking ahead, WNP expects to maintain a debt to equity ratio of 1.5 as per the OEB’s expectations.

Profitability: *Regulatory Return on Equity* - WNP anticipate its’ ROE will fall within the +/-3% range during the foreseeable future.[17]

o CDM Program Targets and Performance

The conservation and demand management initiatives implemented by WNP under the 2015-2020 Conservation First Framework program administered by the IESO have resulted in a reduction in energy use and overall peak demand. Partly due to this program and partly due to slow customer growth within WNP’s service territory, no capacity constraints are anticipated in the utility’s distribution system during the five year period covered by this DSP and consequently, no investments are proposed to mitigate capacity constraints in the distribution system.

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[17] The information provided by Wellington North Power Inc. for their future performance (“looking ahead” or what can be construed as forward-looking perspective) may be subject to a number of risks, uncertainties and other factors that may cause actual events, conditions or results to differ materially from historical results or those contemplated by the distributor regarding their future performance. Some of the factors that could cause such differences include legislative or regulatory developments, financial market conditions, general economic conditions and the weather. For these reasons, the information on future performance is intended to be WNP’s best judgment and could be markedly different in the future.

- ### Unit Cost Metrics

WNP will continue to replace distribution assets, balancing system risks and customer rate impacts as described in the utility's Cost of Service 2021 rate application (EB-2020-061). In addition, on-going customer engagement initiatives, as described in this DSP and the Cost of Service rate application, will continue to ensure customers have an opportunity to share their viewpoint on their local hydro's capital spending plans.

5.2.4 Realized Efficiencies Due to Smart Meters

WNP notes that it has not realized any cost efficiencies related to the utility's use of Smart Meters since its' last Cost of Service application in 2016; however the utility continues to investigate further integration of smart meter data into its processes and information systems. For example, the use of "Tamper Alert Reports" to identify instances where a Smart Meter has been "tampered with" (struck or interfered with) such as an individual attempting to reconnect a meter after it's been disconnected. The "Tamper Alert Report" identifies a meter has been interfered with and enables the WNP to visit the location to investigate.

5.3 Asset Management Process

5.3.1 Asset Management Process Overview

The asset management process is the systematic approach taken by WNP to collect, tabulate and assess information about physical assets, current and future system operating conditions, cyber-security and privacy obligations whilst addressing the LDC's business goals and customer service needs, ensuring investments are planned, paced and prioritized to minimize rate changes to our customers.

This section provides stakeholders with an understanding of WNP's asset management process as well as the relationship between the process and the expenditure decisions that formulate into WNP's capital investment plan.

5.3.1a Asset Management Objectives

WNP's Asset Management objectives, ranked in order of importance, are:

Importance	Objective
High	Maximizing public and employee safety.
High	Reliability of the distribution system.
High	Consideration of the total cost of the asset to minimize the long-term costs borne by the ratepayers. (Cost-effectiveness to maintain / repair an existing asset (O&M expense) rather than replace with a new asset (CapEx)
High	Minimize environment risks and hazards.
High	Meeting customers' needs and expectations today and for the future.
High	Consideration of acts, regulations, guidelines and good utility practice.
Medium	Provide the shareholders the full regulated return on equity.
Medium	Aligning the DSP with Regional Planning objectives and provincial Long-term Energy Plans.
Low	Facilitating Smart Grid development.
Low	Facilitating new renewable connections.

The comments below provide context on why WNP ranked these Asset Management objectives in this hierarchy of importance:

- **Maximizing public and employee safety:** WNP is committed to operating in an environment that is safe, taking precautions to protect its employees and customers as well as all other stakeholders whether working on site, in the office or at a customer's property. Safety also encompasses cyber-security and the protection of employee and customer personal identifiable information.

- **Reliability of the distribution:** WNP is committed to maintain the reliability of its' system minimizing outages and interruptions. Effective asset management considers asset health as an indicator which may identify assets with a high probability of failure by replacing these assets may reduce the probability of equipment failure.
- **Consideration of the total cost of the asset to minimize the long-term costs borne by the ratepayers:** WNP considers the cost-effectiveness of on-going expenses to maintain / repair an existing asset (O&M expense) rather than replace with a new asset (CapEx).
- **Minimize environment risks and hazards:** WNP recognizes that sustained economic prosperity is only possible if adequate provision is made for the protection of the environment. The utility identifies, assesses and manages the environmental impacts and risks associated with our operational activities (e.g. safe disposal of old PCB transformers).
- **Meeting customers' needs today and for the future:** WNP seeks to fulfill customers' expectations not just today but also the future. For instance ensuring there is adequate capacity to manage population and industrial growth in our community as demonstrated by the building of a 2nd 44kV feeder in 2016 to provide for planned growth.
- **Consideration of acts, regulations, guidelines and good utility practice:** WNP wants to be recognized as a utility that demonstrates good utility practice whilst adhering to codes, guidelines and mandates set by the authority bodies such as the Ministry of Energy Northern Development and Mines, Ministry of Finance, Ministry of Labour, Measurement Canada, Public Health, the ESA, the OEB and the IESO. Adhering to the acts and regulations is required to hold a distributor's license.
- **Provide the shareholders the full regulated return on equity:** Being owned by Municipal Townships, WNP operates as an efficient business providing regular Promissory Note payments and predictable dividends to its' shareholders to help fund the economic prosperity and well-being of the community in which WNP operates.
- **Aligning the DSP with Regional Planning objectives and provincial Long-term Energy Plans:** WNP participates in the Regional Planning meetings facilitated by the IESO. Given that the aggregated kW demand of the utility represents a very small percentage of the total regional demand requirements, WNP has ranked this of lower importance.
- **Facilitating Smart Grid development:** WNP is monitoring the pilot programs, such as Distributed Energy Resources and battery storage solutions. To date, the utility has received no requests from its customers for this new technology, hence why this is of a lower importance; however WNP will actively support any customer projects if they come forward.
- **Facilitating new renewable connections:** Given that all new renewable contracts were cancelled in 2018, WNP has reduced the importance of connecting green energy and renewable energy sources.

The table below illustrates how WNP's Asset Management objectives relate to the OEB's Renewed Regulatory Framework (RRF) performance outcomes and link to WNP's strategic objectives.

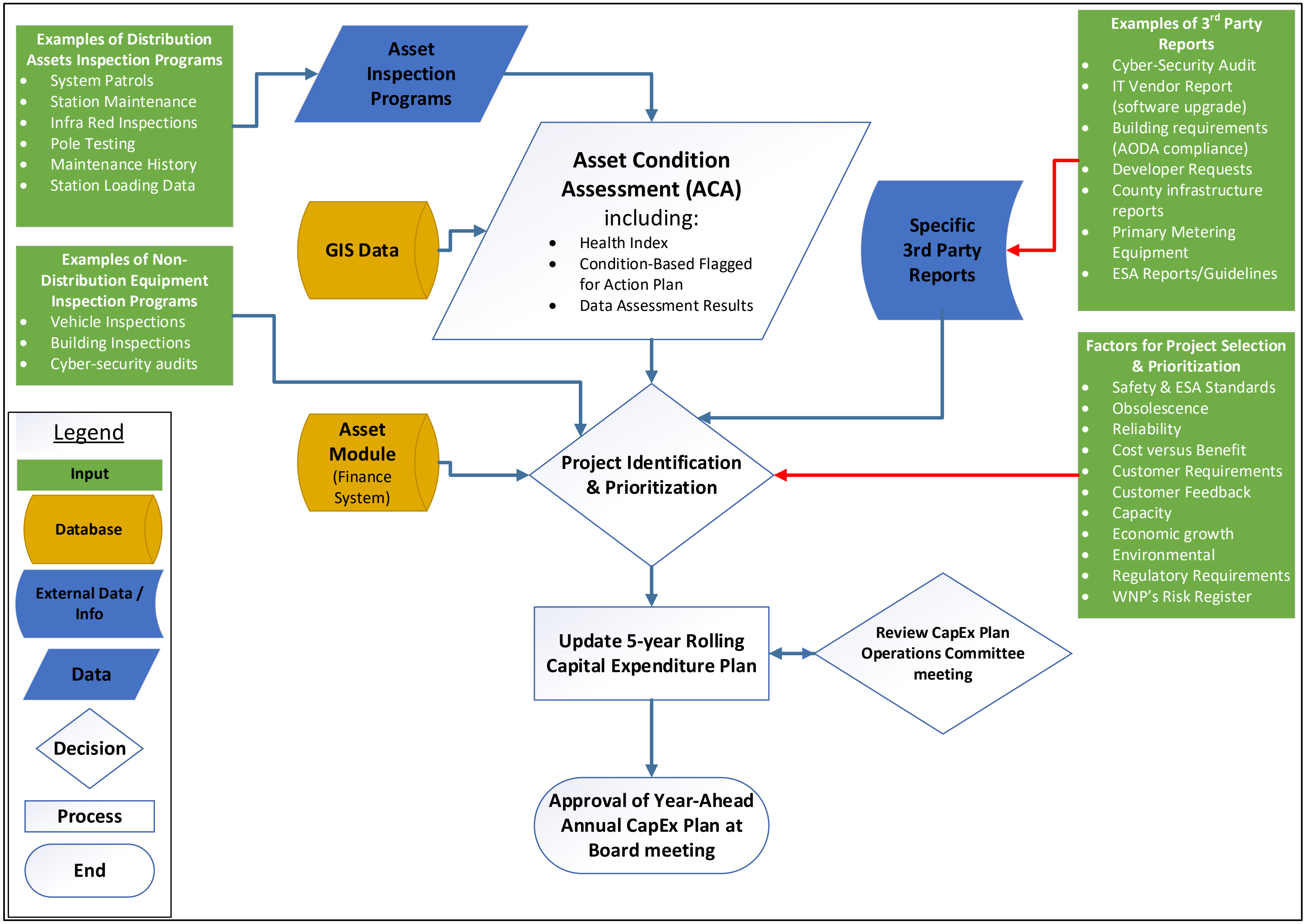
Figure 56: Asset Management Objectives – Renewed Regulatory Framework Outcomes

RRF Performance Outcomes	WNP's Asset Management Objectives	WNP's Strategic Objectives
Customer Focus	o Meeting customers' needs and expectations today and for the future. o Consideration of the total cost of the asset to minimize the long-term costs borne by the ratepayers	• Manage a safe and reliable distribution system in an efficient and cost effective manner • Provide outstanding customer service.
Operational Effectiveness	o Reliability of the distribution system. o Aligning the DSP with Regional Planning objectives and provincial Long-term Energy Plans. o Meeting customers' needs and expectations today and for the future. o Consideration of acts, regulations, guidelines and good utility practice.	• Manage a safe and reliable distribution system in an efficient and cost effective manner.
Public Policy Responsiveness	o Maximizing public and employee safety. o Minimize environment risks and hazards. o Consideration of acts, regulations, guidelines and good utility practice. o Facilitating Smart Grid development. o Facilitating new renewable connections.	• Manage a safe and reliable distribution system in an efficient and cost effective manner. • Meet all regulatory obligations.
Financial Performance	o Consideration of the total cost of the asset to minimize the long-term costs borne by the ratepayers o Provide the shareholders the full regulated return on equity.	• Manage a safe and reliable distribution system in an efficient and cost effective manner. • Continue to increase shareholder value.

5.3.1b Components of the Asset Management Process used for Capital Expenditure Plan

The flowchart below summarizes the core components of WNP's Asset Management Process for prioritization of investments:

Figure 57: Asset Management Process Flowchart



Below is a summary of the core components of WNP's Asset Management Process for prioritization of investments:

- **Asset Condition Assessment:**

  Since its' previous DSP (2015), WNP has formalized the Asset Condition Assessment (ACA) activity by retaining Kinectrics Inc. to complete a thorough ACA study of its' distribution assets (substation transformers, substation load switches, substation switchgear, pole-mount transformers, pad-mount transformers and poles). WNP provided Kinectrics with:
  - GIS data (e.g. size, age, type);
  - Inspection reports (e.g. infra-red, Polux pole-test data, oil sample studies, loading) and;
  - Work-order results (e.g. maintenance inspections).

  From this information, Kinectrics conducted an ACA study that produced:

  i. Health Index of assets – based on numerous condition parameters related to the degradation factors that lead to an asset's end of service life. The Health Index is an indicator of the asset's overall health and is typically given in terms of percentage, with 100% representing an asset in brand new condition.

  ii. Condition-Based Flagged for Action Plan – this outlines the number of units that are expected to require attention in the next 10 years. The number of units are estimated using either a proactive or reactive approach. In the proactive approach, units are considered for action prior to failure, whereas the reactive approach is based on expected failures per year. Both approaches consider asset removal rate and probability of failure.

  iii. Data Assessment Results – consideration for the availability and quality of data.

  A copy of Kinectrics ACA study, including details about the methodology used to determine the "Health Index" and "Flagged for Action Plan" as well as the results for reach asset category, is included in Appendix B. WNP has reviewed the ACA study and incorporated the assets identified in the "Flagged for Action Plan" into the development of a list of potential future projects.

- **3rd Party Inputs:**

  Third- party reports are categorized by:

  i. Partners and Audits – recommendations from:
     - Business partners (such as IT, Metering Service Provider) advising of asset replacement due to condition, age of technology or regulatory requirements.
     - Findings from audits (e.g. recommendations to enhance cyber-security controls).

  ii. Infrastructure:
     - Reports from the county advising of construction projects that may require work by WNP (i.e. road-widening project meaning poles need to be relocated).
     - Developers requiring a service lay-out or drawings for proposed developments.

iii. Codes & Obligations such as requirements for WNP's buildings to comply with Accessibility Ontario Disability Act (AODA).

- **Project Identification & Prioritization:**
  There is no formal quantitative means of prioritizing projects; however WNP takes a qualitative approach by taking into account information from:

  - The Asset Condition Assessment study;
  - The 3rd party reports; and
  - Non-distribution equipment inspection programs.

In addition, WNP also considers the importance of projects according to its' asset management objectives. For instance, if a project is identified as "high importance" it will be prioritized above other projects that are "medium" or "low importance". "High importance" project status is achieved by fulfilling one or more of the following asset management objectives:

- Enhances public and/or employee safety;
- Maintains reliability of the distribution system;
- Cost-effectiveness to maintain / repair an existing asset (O&M expense) rather than replace with a new asset (CapEx);
- Minimizes environmental risks and hazards;
- Meets customers' needs today and expectations for tomorrow; and
- Is necessary so as to adhere to acts, regulations and/or safety standards.

WNP also considers if the project will complement the utility's mission statement to:

"*provide its customers with the most cost effective delivery of electricity safely, reliably and efficiently. This will be done while providing superior customer service and promoting customer education and green initiatives within its service area*."

Lastly, WNP will prioritize the project according to available funding. For instance, is funding available as a capital contribution from a developer? Will the utility have to source a loan from a financing institution to fund the project (for example a replacement substation) and if so, does the utility currently have the debt-capacity.

5.3.2 Overview of Assets Managed

5.3.2a Description of Distribution Service Area

Wellington North Power Inc. (WNP) is an embedded distributor within Hydro One's service territory. WNP is a local distribution company servicing approximately 3,800 customers in the Town of Mount Forest, Village of Arthur and the Village of Holstein in southwestern Ontario.

Figure 58: Wellington North Power Inc.'s Service Territory

The distributor's service territory is approximately 14 sq. km of medium density urban area and spans across the County of Wellington (Arthur and Mount Forest) and Grey County (Holstein).

The table below summarizes the service area and assets managed by WNP:

Figure 59: WNP's System Summary Overview

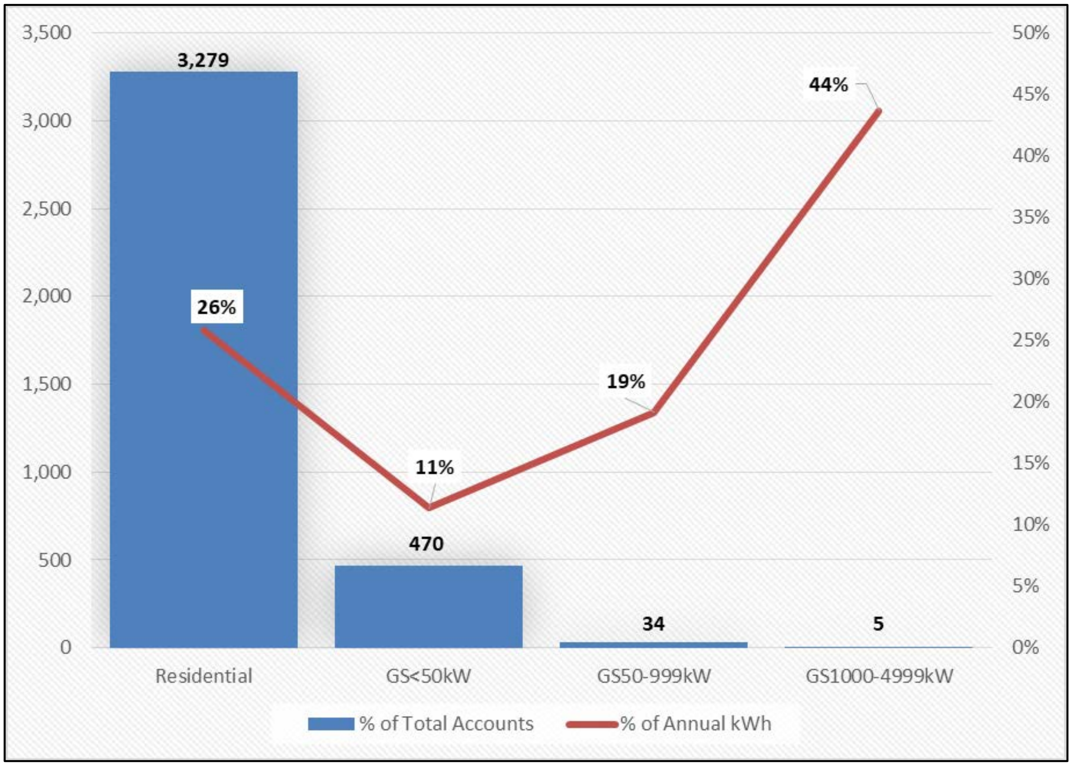
	2019	Supporting Information
Maximum Monthly Peak *(with embedded generation)*	16,845 kW	Month of Peak Demand: January 2019.
Service Area (sq. km)	14	
Kilometers of Line	79	
Total Customers (Metered)		Annual Usage (kWh)
Residential	3,314	25,253,896
General Service <50kW	476	11,138,172
General Service 50-9999 kW	35	18,739,880
General Service 1000-4999 kW	5	42,766,148
Total Number of Metered Accounts	3,830	97,898,096
Total Unmetered Connections		Annual Usage (kWh)
Unmetered Scattered Load	4	6,288
Sentinel Lights	23	19,673
Street Lighting	907	650,270
Total Number of Connections	934	676,231
Annual Metered Consumption (kWh) (not billed, excludes losses for months January to December inclusive)		98,574,327
Annual Generation kWh	392,026 kWh	Annual generated kWh during 2019 from 22 MicroFIT accounts and 1 FIT account
Number of Substations	6	
Wholesale Meter Points	4	
Poles	1,890	
Primary Lines (km)		
Overhead	69	
Underground	10	
Transformers (units)		
Overhead (Polemount)	522	
Underground (Padmount)	145	
44kV Switches Load Break	6	

Notes: The information in the above table represents the data as at December 31st 2019.
Number of Connections / Accounts is at December 31st 2019.
Annual kWh is metered kWh without Losses.

Customer Composite:

The chart below illustrates the number of metered customer accounts and the annual metered kWh consumption by rate class for 2019:

Figure 60: Customer Accounts and Annual Consumption



Rate Class	# of Total Accounts	% of Total Accounts	Annual kWh	% of Total Annual kWh
Residential	3,314	86.53%	25,253,896	26%
GS<50kW	476	12.43%	11,138,172	11%
GS50-999kW	35	0.91%	18,739,880	19%
GS1000-4999kW	5	0.13%	42,766,148	44%
Total	**3,830**		**97,898,096**	

Note: Customer count s as December 31st 2019; consumption is metered kWh (without Losses) for Jan-Dec 2019.

The above figure illustrates WNP's customer-base comprises of:

- 87% Residential accounts who, in 2019, accounted for 26% of the Distributor's total annual kWh consumption (for metered accounts).
- Less than 2% of the customer-base accounted for 63% of the LDC's annual metered kWh consumption (metered accounts) from rate classes General Service 50-999kW and General Service 1,000-4,999kW.

Utility Characteristics

WNP is a winter-peaking utility servicing the urban areas of Arthur, Holstein and Mount Forest. The table below summarizes the characteristics of WNP over the most recent five-year period:

Figure 61: Utility Characteristics

Characteristics	2015	2016	2017	2018	2019
Population Served	7,200	7,200	7,200	7,200	7,200
Municipal Population	11,500	11,500	11,500	11,500	11,500
Seasonal Population	0	0	0	0	0
Total Customers (metered)	3,727	3,730	3,758	3,789	3,830
Residential Customers	3,212	3,219	3,246	3,279	3,314
General Service <50 kW Customers	474	469	473	470	476
General Service >50 kW Customers	41	41	40	40	40
Large User (>5000 kW) Customers	0	0	0	0	0
Total Service Area (km²)	14	14	14	14	14
Rural Service Area (km²)	0	0	0	0	0
Urban Service Area (km²)	14	14	14	14	14
Total km of line	76	79	79	79	79
Km of Overhead line	66	69	69	69	69
Km of Underground line	10	10	10	10	10
Total kWh Purchased	111,789,934	108,699,220	106,743,638	106,275,600	104,522,560
Total kWh Sold *(excluding Losses)*	105,356,697	102,633,741	100,777,475	99,864,919	98,574,327
Total Distribution Losses (kWh)	6,780,681	6,445,259	6,345,267	6,801,769	6,340,259
Winter Peak (kW) *(with embedded generation)*	17,359	16,484	16,381	16,660	16,845
Winter Peak (kW) *(without embedded generation)*	17,690	16,760	16,780	16,685	16,845
Summer Peak (kW) *(with embedded generation)*	16,660	16,466	16,004	16,355	15,949
Summer Peak (kW) *(without embedded generation)*	16,938	16,739	16,292	16,554	16,156
Annual Average Peak (kW) *(with embedded generation)*	16,068	15,877	15,454	15,818	15,324
Annual Average Peak (kW) *(without embedded generation)*	16,309	16,119	15,720	15,902	15,428
Average Load Factor *(with embedded generation)*	76%	75%	75%	74%	75%
Average Load Factor *(without embedded generation)*	76%	76%	76%	74%	75%

Notes: The information presented above is data at the end of each year (i.e. as at December 31st).
"Total kWh Purchases and Total kWh Sold" includes generated kWhs from MicroFIT and FIT accounts.

5.3.2b Description of System Configuration

WNP is an embedded distributor within Hydro One's service territory and is connected to the grid through Hydro Ones Transmissions Station feeders:

Figure 62: Transmission Station Feeders

Transformer Substation Owner	Transformer Name	Community Served within Wellington North Power Service Territory
Hydro One Networks Inc.	NA73 - Fergus TS	Urban Area of Arthur
Hydro One Networks Inc.	NA28 - Palmerston TS	Urban Areas of Mount Forest
Hydro One Networks Inc.	NA36 - Hanover TS	Urban Areas of Holstein and Mount Forest

WNP is a registered Market Participant, dealing directly with the Independent Electricity System Operator (IESO) for the electricity which is passed through our distribution system to consumers.
As an embedded utility, WNP is billed monthly by Hydro One for all Transmission related charges including Low Voltage. Transmission and Low Voltage charges are passed through to WNP's customers.

WNP's service area consists of 44kV, 8.3kV, and 4.16kV high voltage systems.

WNP has three Hydro One 44kV feeders serving its distribution territory. WNP owns and operates the electricity distribution system in its licensed service area including parts of the Township of Wellington North and the Township of Southgate, serving approximately 3,800 Residential, General Service, Street Lighting, Sentinel Light and Unmetered Scattered Load customers/connections.

WNP's distribution assets include:

- Four municipal distribution stations that steps voltage from 44kV to 4.16kV for distribution within the town of Mount Forest;
- Two municipal distribution stations that steps voltage from 44kV to 4.16kV for distribution within the village of Arthur, and;
- Distribution assets supplied by a Hydro One distribution station which service our customers in the village of Holstein.

WNP receives power from three Hydro One 44kV circuits; one from Fergus TS, one from Palmerston TS and one from Hanover TS. These 44kV circuits are used to supply our distribution assets described above. Electricity is then distributed through WNP's service area of 14 square kilometers through the company's 69km of overhead conductors and 10km of underground cable.

The distribution voltage of 4.16kV is stepped down by approximately 667 transformers, both overhead and underground, to the service voltage provided to our customers. WNP monitors its distribution system using a System Control and Data Acquisition (SCADA) at its main office building at 290 Queen Street West in Mount Forest, Ontario.

WNP owns and maintains approximately 3,800 meters installed on its customers' premises for the purpose of measuring energy consumption of electricity for billing purposes. Meters vary in type by customer and include meters capable of measuring kWh consumption, kW demand and kVA, as well as hourly interval data. WNP completed the installation of all of its Residential and General Service <50kW Smart Meters by December 2010 as part of the Province of Ontario's Smart Meter initiative. On June 25, 2008, Ontario Regulation 235/08 was filed by the Ontario Provincial Government giving WNP authorization to proceed with its first phase of Smart Meter installation.

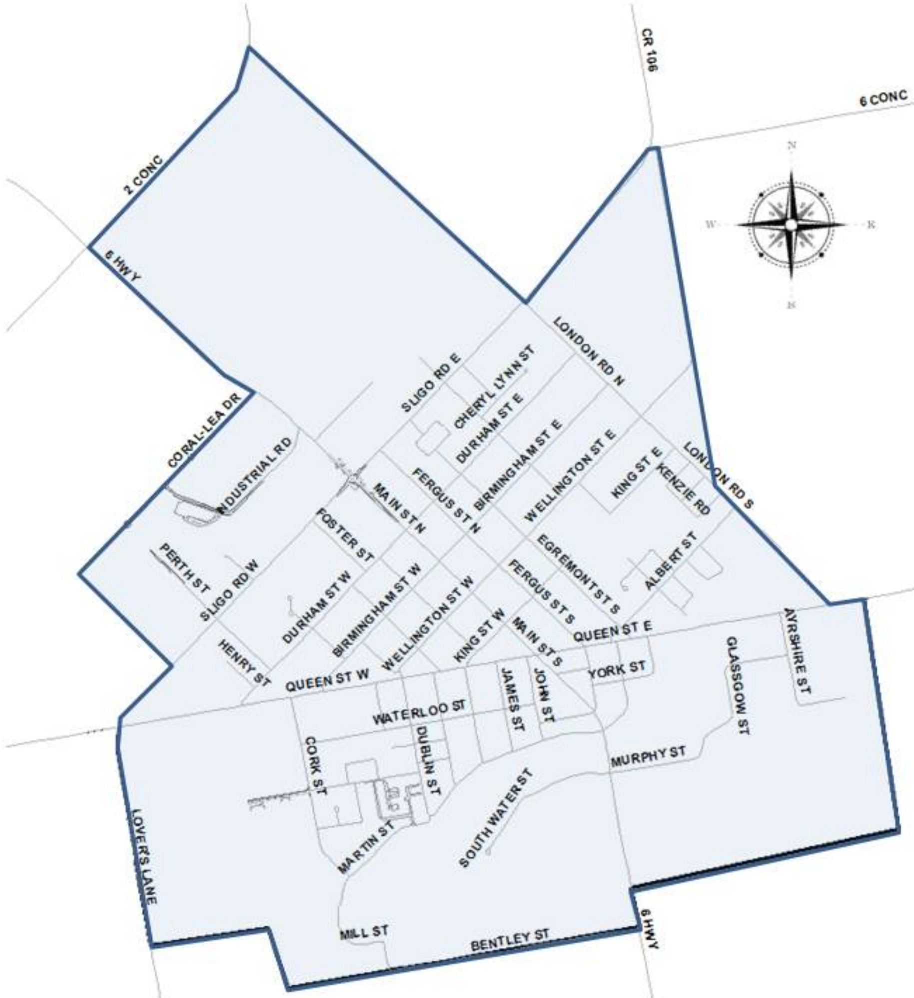
In managing its distribution system assets, WNP's main objective is to optimize performance of the assets at a reasonable cost with due regard for system reliability, public and worker safety and customer service requirements.

In addition to the capital needs of the network, WNP provides maintenance planning for the assets. WNP's assets fall into two broad categories:

- Distribution Plant - includes assets such as substation building, wires, overhead and underground electricity distribution infrastructure, transformers, meters and substations; and
- General Plant - includes assets such as, office building and service centre, computer equipment and software. General Plant also includes the company's fleet of six vehicles and stores equipment.

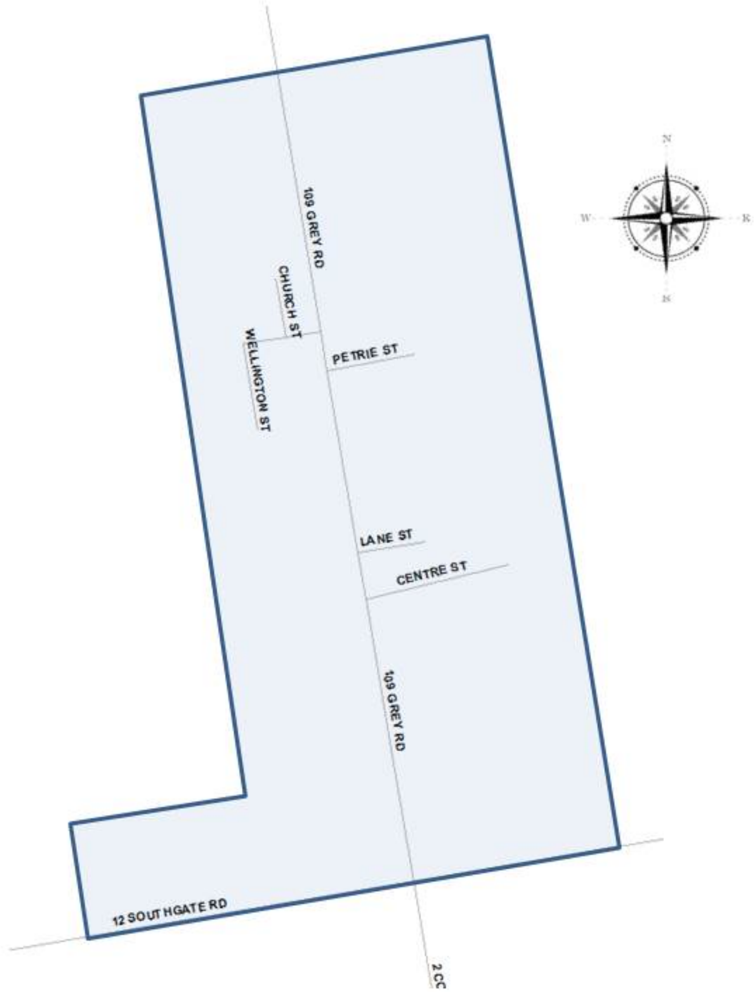
The following pages illustrate WNP service area maps and single-line diagrams:

WNP Service Territory Map – **Mount Forest**

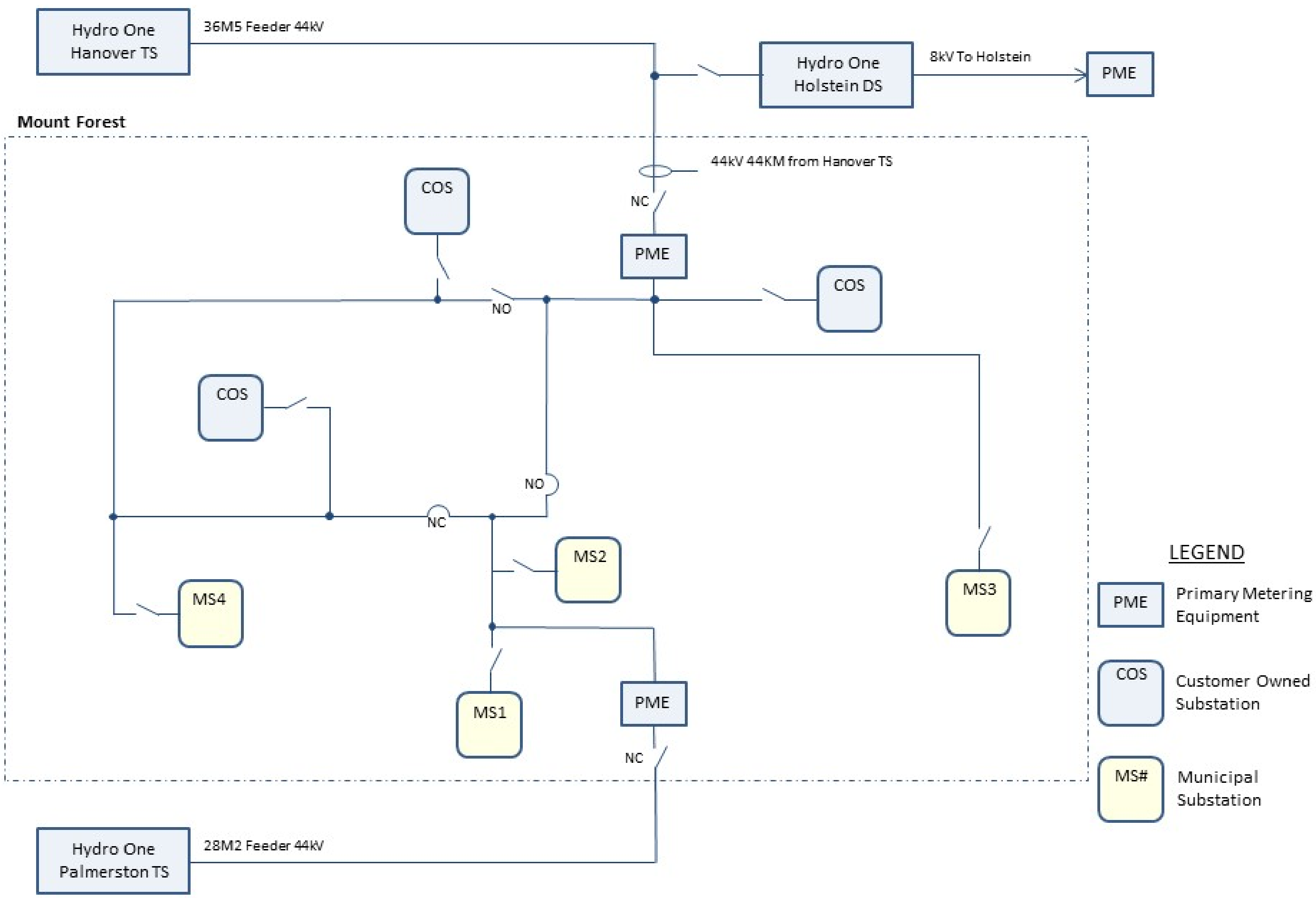


WNP Service Territory Map – **Arthur**

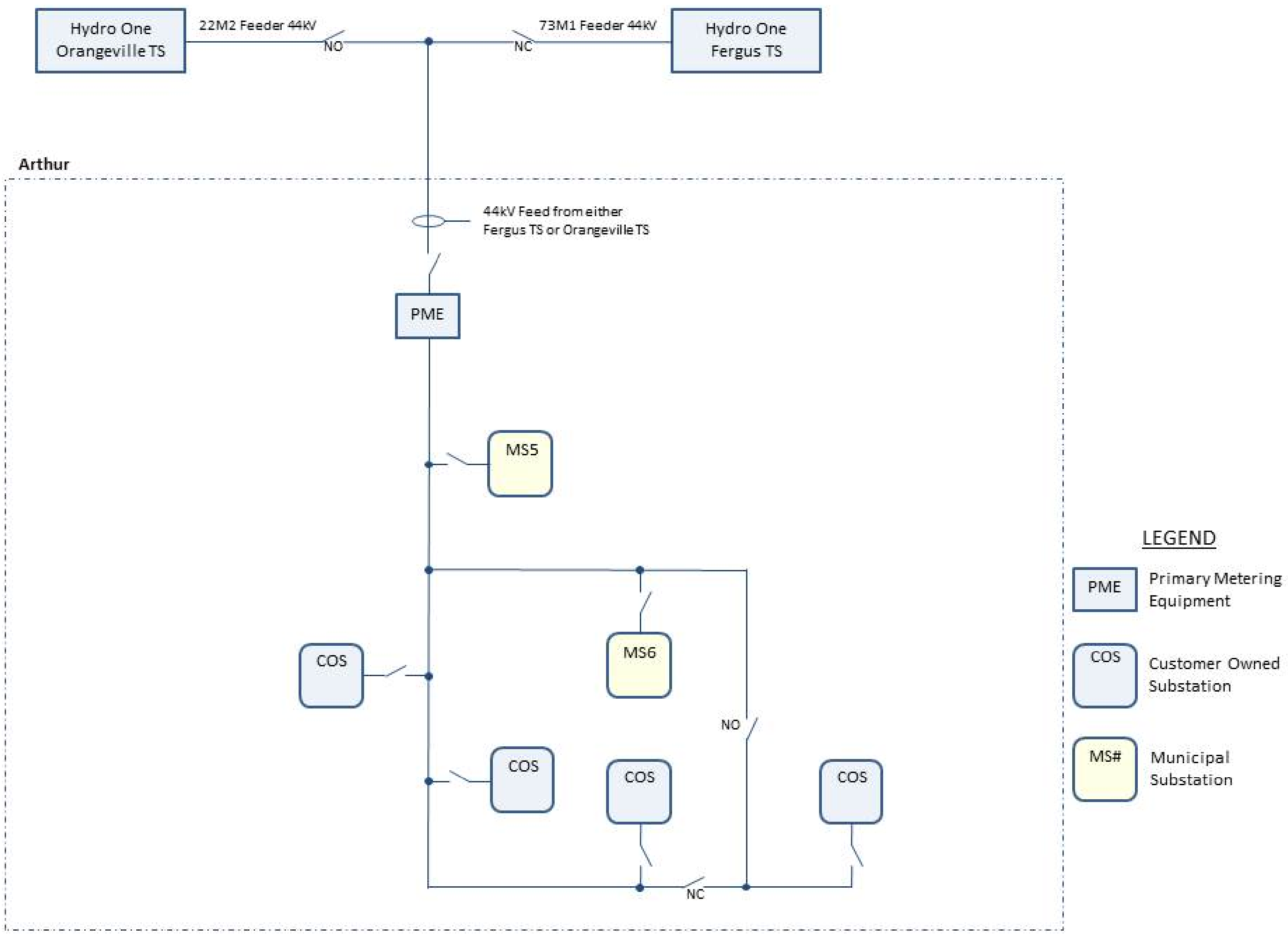
WNP Service Territory Map – **Holstein**



Mount Forest & Holstein Single Line Diagram showing 44kV – LDC Owned versus. Customer Owned Substations (COS)



Arthur Single Line Diagram showing 44kV – LDC Owned versus. Customer Owned Substations (COS)



5.3.2c Asset Type – Profile and Condition

Since its' previous DSP (2015), WNP has formalized the Asset Condition Assessment (ACA) activity by retaining Kinectrics Inc. to complete a thorough ACA study of its' key distribution assets (MS Transformers, MS Switchgear, MS Load Switches, Pad Mounted Transformers, Pole Mounted Transformers 1-phase and 3-phase, and Poles 4kV and 44kV). Excluded from the ACA study were Line Switches and Cutouts, Conductor, and Meters and Monitoring.

Report Summary

In 2020 WNP determined a need to perform a condition assessment of its key distribution assets. WNP selected and engaged Kinectrics Inc. (Kinectrics) to assist with this work. Their report, found in Appendix B, presents the results of 2020 Asset Condition Assessment (ACA) study and is based on the available condition data as at the end of December 2019.

The asset groups included in the 2020 ACA are as follows, including 6 categories or 8 sub-categories:

- MS Transformers.
- MS Switchgear.
- MS Load Switches.
- Pad Mounted Transformers.
- Pole Mounted Transformers (1-Phase, 3-Phase).
- Poles (4 kV, 44 kV).

For each asset category, available data was assessed, "Health Index" was determined, and condition-based "Flagged for Action Plan" was developed.

Overall Health Index Distribution

In general, 6 of the 8 sub-categories had over 80% of their units classified as "good" or "very good", and 3 of the 8 sub-categories had an average Health Index score of greater than 80%.

With respect to the asset categories of concern, Pole Mounted Transformers (1-Phase) had 15% of units classified as "poor" or "very poor", with an average Health Index below 70%.

Flagged for Action Plans

In general, no sub-categories showed major backlog in terms of flagged for action numbers in the first year. All sub-categories either had no unit flagged for action, or had their flagged for action plans showing smooth variation throughout the next 10 years

In the short term, it was determined that MS Switchgear and MS Load Switches had the highest percentages of units flagged for action in first year, being 16.7% of population in both cases. Given the fact that the population was 6 in both cases, this represented 1 unit respectively.

Furthermore, within the next 10 years, over 30% of the Pad Mounted Transformers and Pole Mounted Transformers (both 1-Ph and 3-Ph) are expected to require some action to be taken to address their condition.

The actual replacement plans might be only a subset of the Flagged for Action plans after Kinectrics review based on WNP's maintenance and replacement strategy.

Data Availability

The asset groups of MS Transformers, MS Switchgear, MS Load Switches and Poles (both 4 kV and 44 kV) had relatively complete data sets, with both test and detailed inspection data available in addition to age information.

Pad Mounted Transformers and Pole Mounted Transformers (both 1-Phase and 3-Phase) had overall inspection data, infrared test data and age information.

Recommendations

Kinectrics noted that, compared to other local distribution utilities, WNP had above average amount of data for 2020 ACA study, based on which informed decisions could be made. For the purpose of improving ACA study in the future, it is recommended that WNP enhance data collection in the following areas:

- Acquisition of loading data for all the transformers.
- Operation cycle counts for MS Switchgear and Load Switches, as well as manufacturer specification limits on contact resistance and operation cycles, for the purpose of estimating switch degradation due to usage.

- Adoption of a single file (instead of separate files) that is extractable (e.g. excel spreadsheet) to contain the inspection and test data for all the individual units, for the asset groups inside stations (MS Transformers, MS Switchgear, MS Load Switches).
- Historic records of asset removal for all the asset groups, for the purpose of specific asset degradation curves in the future.

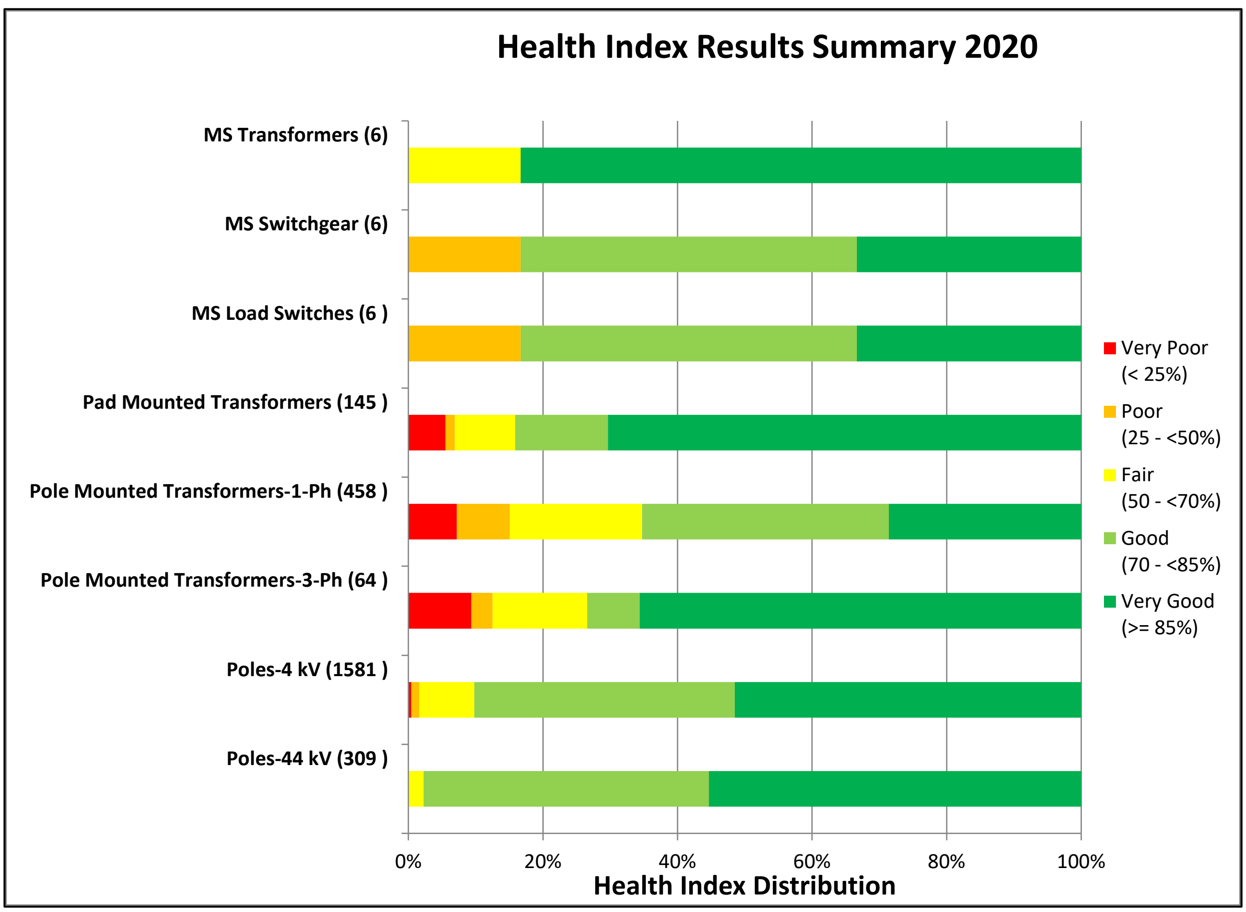
The results presented in the study are based solely on asset condition as determined by available data. Note that there are numerous other considerations that may influence WNP's planning process. Among these are obsolescence, system growth, corporate priorities, technological advancements, etc.

Summary of Results

o **Health Index**

A summary of the Health Index distribution for all asset categories are graphically shown in Figure 63 below. Note that the Health Index distribution percentages are based on the asset group's sample size.

Figure 63: Health Index Results Summary



It can be observed that out of the 8 sub-categories, 6 of them had over 80% of their units classified as "good" or "very good", and 3 of them had an average Health Index score of greater than 80%.

It can be seen from the results that among all the asset categories, Pole Mounted Transformers (1-Ph) were relatively speaking the one of concern. About 15% of the units in these asset groups were classified as "poor" or "very poor", with an average Health Index score below 70%.

Both MS Switchgear and MS Load Switches had 17% of their units classified as "Poor" or "Very Poor". Given the fact that there were in total only 6 units in each of these 2 groups, this represented only 1 unit respectively.

- **Flagged for Action Plan**

The Flagged for Action Plan estimates the number of units expected to require attention in a given year. Figure 64 shows the Year 0 (year 2020) and 10 Year cumulative Flagged for Action Plan.

Figure 64: Flagged for Action Plan

Asset Category		1st Year Action		10 Year Action in Total		Replacement Strategy
		Quantity	Percentage	Quantity	Percentage	
MS Transformers		0	0.0%	0	0.0%	Proactive
MS Switchgear		1	16.7%	1	16.7%	Proactive
MS Load Switches		1	16.7%	1	16.7%	Proactive
Pad Mounted Transformers		6	4.1%	56	38.6%	Proactive
Pole Mounted Transformers	1-Ph	17	3.7%	146	31.9%	Reactive
	3-Ph	2	3.1%	20	31.3%	Reactive
Poles	4 kV	40	2.5%	422	26.7%	Reactive
	44 kV	7	2.3%	80	25.9%	Reactive

100% 0%

Excluded from the ACA study were Line Switches and Cutouts, Conductor, and Meters. There is limited amount of data for Line Switches, Cutouts and Conductors. WNP follows Measurement Canada regulations for meter verifications.

5.3.2c MS Municipal Substations

WNP owns and operates six municipal sub-stations. The station data is summarized below in Figure 65. They are located within the Village of Arthur and Town of Mount Forest. Each station is controlled by appropriately rated MS Transformers, MS Switchgear and MS Load Switches. All stations are monitored through WNP's SCADA system.

Figure 65: Substation Data

Station	Year	Voltage	Transformer Size	Number of Feeders	HV Protection	LV Protection
Mount Forest MS1	1986	44 - 4.16kV	5.0MVA	4	SMD-2C 80A Type E Fuse	SM-5 400A Type E Fuse
Mount Forest MS2	2014	44 - 4.16kV	5.0MVA	4	SMD-2C 100A Type E Fuse	SEL 351R Recloser & Relay
Mount Forest MS3	2018	44 - 4.16kV	5.0MVA	4	SMD-2C 100A Type E Fuse	SEL 351R Recloser & Relay
Mount Forest MS4	1964	44 - 4.16kV	2.0MVA	4①	SMD-2C 40A Type E Fuse	SM-5 400A Type E Fuse
Arthur MS5	1994	44 - 4.16kV	5.0MVA	3	SMD-2C 100A Type E Fuse	SM-5 400A Type E Fuse
Arthur MS6	2010	44 - 4.16kV	5.0MVA	2	SMD-2C 100A Type E Fuse	SM-5 400A Type E Fuse

① Feeder F2 is the only feeder connected and in service

Each feeder in Arthur and Mount Forest are controlled by either a fused or non-fused metal enclosed gang operated load break switch. Wellington North Power's MS1, MS4, MS5 and MS6 feeders. MS2 and MS3 also have remote controlled reclosers for the 4.16kV feeders.

Station	44kV Primary	4.16kV Feeder	Protection
MS1	Gang Operated Air Load Break Switch	Gang Operated Metal Enclosed Fused Load Break Switch	Fused
MS2	Gang Operated Metal Enclosed Load Break Switch	Gang Operated Metal Enclosed Non-Fused Load Break Switch	Reclosers x4
MS3	Gang Operated Air Load Break Switch	Gang Operated Metal Enclosed Non-Fused Load Break Switch	Reclosers x4
MS4	Gang Operated Air Load Break Switch	Gang Operated Metal Enclosed Fused Load Break Switch	Fused
MS5	Gang Operated Air Load Break Switch	Gang Operated Metal Enclosed Fused Load Break Switch	Fused
MS6	Gang Operated Air Load Break Switch	Gang Operated Metal Enclosed Fused Load Break Switch	Fused

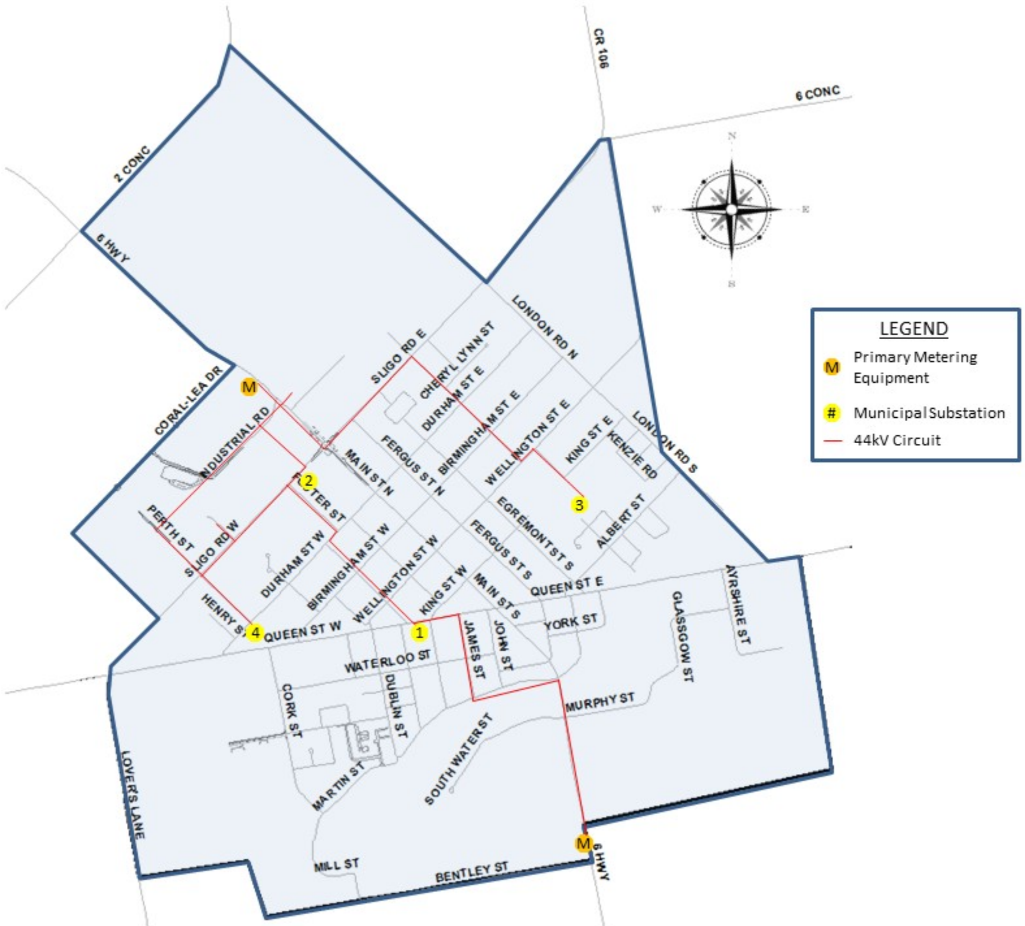
Mount Forest

The Town of Mount Forest is supplied by two 44kV HONI M Class feeders. One feeder is from Hanover TS and is identified as 36M5. The seconder feeder from Palmerston, identified as 28M2 was constructed and energized in 2016 due to a capacity issue with the 36M5 as presented in Wellington North Power's 2015 rate application.

The 44kV feeders running through the town of Mount Forest supply four 44 to 4.16kV municipal stations owned and operated by Wellington North Power, as well as three private stations owned by businesses.

The four municipal stations, fed by the 44kV sub-transmission system, are being replaced in a proactive manner as they reach their end of life. Municipal Station Two "MS2" was replaced in 2014 and Municipal Station Three "MS3" was replaced in 2018.

Figure 66: – 44kV System in Mount Forest



Mount Forest - Substation MS1

WNP MS1 provides service to the south portion of Mount Forest and serves primarily residential customers. The transformer is a 5.0 MVA unit with four 4.16kV feeders. The station is currently protected by SMD-2C, 80A Type E fuses on the HV side and by SM-5 400A Type E fuses on the LV side. The power transformer and switchgear at this station is stamped with a manufactured date of 1986.

WNP has redundancy built into its distribution feeder network as follows:

Distribution Feeder	Contingency Feeder (Switch)
MS1 F1	MS4 F2 (SPM046 at Cork & Queen W)
MS1 F2	MS1 F3 (SPM019 at 340 John St) or MS3 F2 (LB4-001 at Parkside Dr)
MS1 F3	MS1 F2 (SPM019 at 340 John St) or MS3 F2 (LB4-002 at Peel St)
MS1 F4	MS2 F3 (SPM016 at Normanby & Wellington W)

Mount Forest – Substation MS2

WNP MS2 provides service to the central-north portion of Mount Forest and serves both residential and small business customers. The station was rebuilt in 2014 and consists of a 44kV enclosed fused load break switch, 5MVA power transformer, a 5 bay 4.16kV switchgear assembly, four (4) auto-recloser units one per feeder, pad mount station service transformer and a 10 x 10 control enclosure.

WNP has redundancy built into its distribution feeder network as follows:

Distribution Feeder	Contingency Feeder (Switch)
MS2 F1	MS3 F4 (LB4-003 at Church St)
MS2 F2	MS3 F4 (SPM047 on Mount Forest Dr)
MS2 F3	MS1 F4 (SPM016 on Normanby St)
MS2 F4	MS4 F2 (SPM022 on Perth St)

Mount Forest - Substation MS3

WNP MS3 provides service to a central-east portion of Mount Forest and serves primarily residential loads. The station was rebuilt in 2018 and consists of a 44kV fused load break switch, 5MVA power transformer, a 5 bay 4.16kV switchgear assembly, four (4) auto-recloser units one per feeder, pad mount station service transformer and a 10 x 10 control enclosure.

WNP has redundancy built into its distribution feeder network as follows:

Distribution Feeder	Contingency Feeder (Switch)
MS3 F1	MS3 F4 (SPM044 at Albert Street)
MS3 F2	MS1 F3 (LB4-002 at Peel Street)
MS3 F3	MS1 F2 (LB4-001 at 383 Parkside Dr)
MS3 F4	MS2 F1 (LB4-003 at Church St)

Mount Forest - Substation MS4

WNP MS4 provides service to a west portion of Mount Forest and serves primarily residential loads. The transformer is a 2.0MVA unit with one feeder currently carrying load. The station is protected by SMD-2C, 40A Type E fuses on the HV side and by SM-5, 400A Type E fuses on the LV side. The power transformer was manufactured in 1964 and the station switchgear was manufactured in 1991.

WNP has redundancy built into its distribution feeder network as follows:

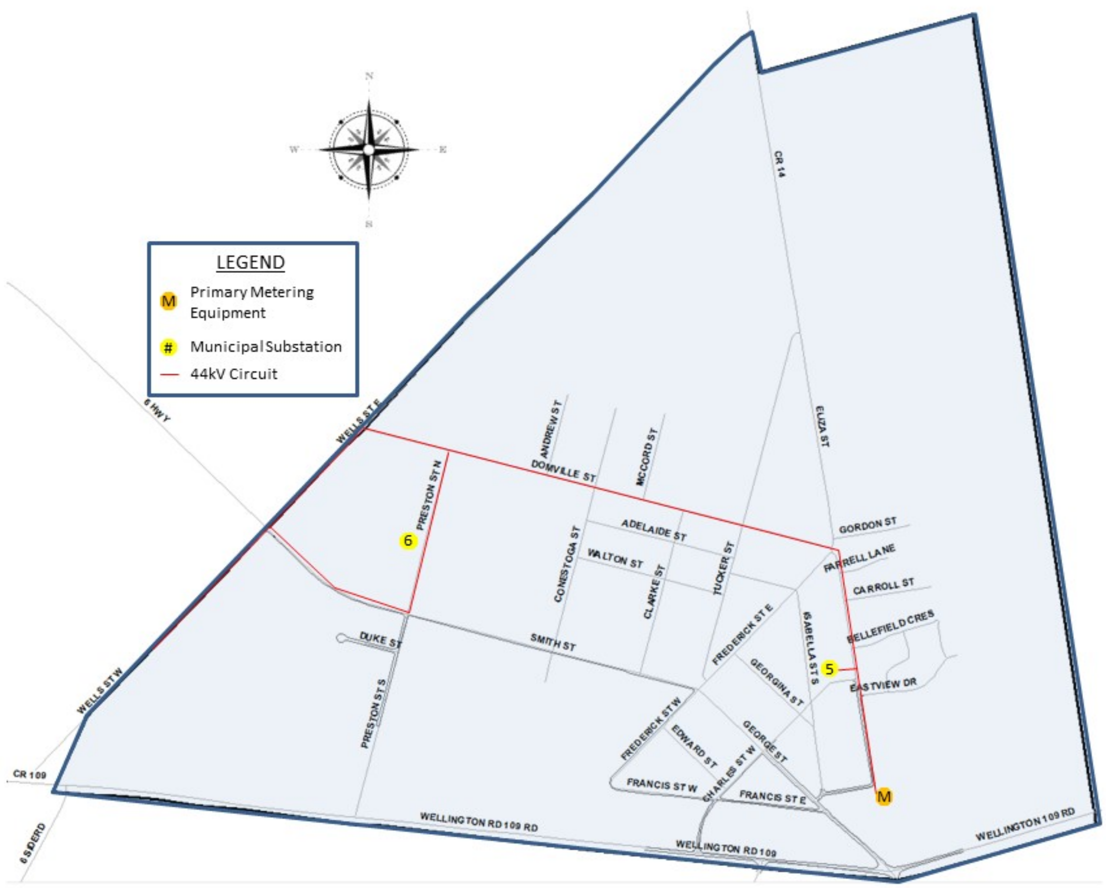
Distribution Feeder	Contingency Feeder (Switch)
MS4 F2	MS1 F1 (SPM046 at Cork & Queen W) or MS2 F4(SPM022 at Perth and Sligo)

Arthur

The Village of Arthur s supplied by a one 44kV HONI M Class feeder. Two 4.16kV stations, fed by the 44kV sub-transmission system, are being maintained in a proactive manner.

The 44kV feeder is fed directly from HONI by 73M1 from Fergus TS. This feeder is a looped supply between Fergus TS and Orangeville TS. This means the Village of Arthur does have a redundant supply, however, the switching required to switch between feeders is owned and controlled by HONI.

Figure 67: 44kV System Arthur



Arthur - Substation MS5

Municipal Station Five "MS5" provides service to a south portion of the village of Arthur and serves both residential and small business loads. The Transformer is a 5.0MVA unit with three feeders, all of which currently carry load. The station is currently protected by SMD-2C, 100A Type E fuses on the HV side and by SM-5, 400A Type E fuses on the LV side. The power transformer at this station was manufactured in 1994.

WNP has redundancy built into its distribution feeder network as follows:

Distribution Feeder	Contingency Feeder (Switch)
MS5 F1	MS5 F2 (SPA010 at Isabella St)
MS5 F2	MS5 F1 (SPA010 at Isabella St) or MS6 F2 (SPA002 on Smith St)
MS5 F3	MS6 F1 (SPA001 at Domville St)

Arthur – Substation MS6

WNP MS6 provides service to a northern portion of the village of Arthur and serves both residential and small business loads. The Transformer is a 5.0MVA unit with two 4.16kV feeders, all of which currently carry load. The station is currently protected by SMD-2C, 100A Type E fuses on the HV side and by SM-5, 400A Type E fuses on the LV side. The power transformer at this station was manufactured in 2010.

WNP has redundancy built into its distribution feeder network as follows:

Distribution Feeder	Contingency Feeder (Switch)
MS6 F1	MS5 F3 (SPA001 at Domville St)
MS6 F2	MS5 F2 (SPA002 on Smith St)

Holstein

There are currently no municipal stations in Holstein. Holstein is supplied from HONI's Holstein DS F3, a shared distribution feeder. Within WNP's service area, all distribution assets associated with Holstein DS F3 are owned and operated by Wellington North Power. Holstein currently has no contingency or back-up feeder.

Asset Condition Assessment MS Transformers

There are a total of six MS Transformers, one at each station. The average age of the MS Transformers was 22. There was sufficient data provided to determine the Health Index for 5.3.2 Overview of Assets Managed including age, loading, oil and various transformer test results. Historic removals records was not available. The average Health Index for MS Transformers was 87%.

Figure 68: MS Transformers Age Distribution Information

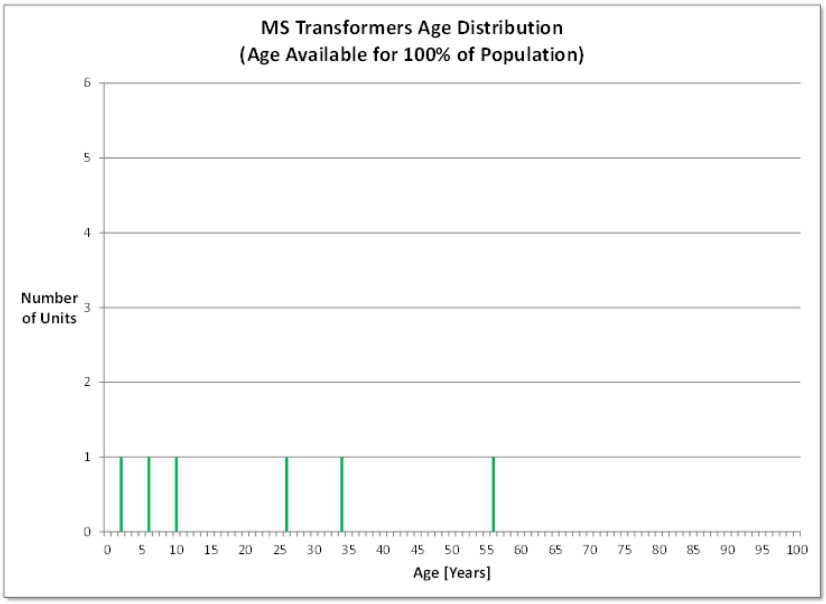
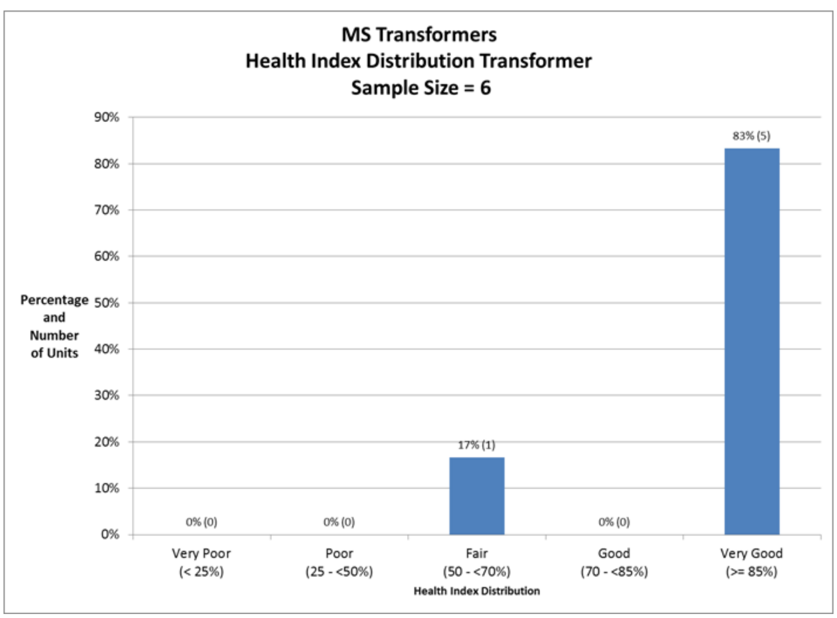


Figure 69: MS Transformers Health Index



The flagged for action plan shows that no unit is flagged for action in the next 10 years.

Asset Condition Assessment MS Switchgear

There are a total of six MS Switchgear, one "line up" at each station. The average age of the MS Switchgear was 25. There was sufficient data provided to determine the Health Index for 5.3.2 Overview of Assets Managed including age, contact resistance and insulation resistance test results, visual inspection records. The data gap was limited to historical removal records. The average Health Index for MS Switchgear was 74%.

Figure 70: MS Switchgear Age Distribution Information

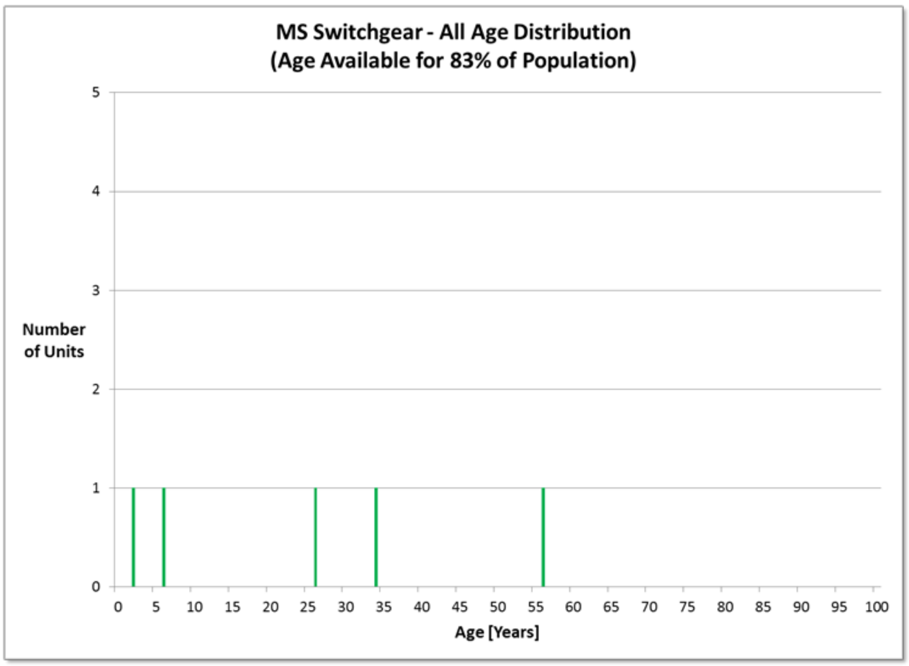


Figure 71: MS Switchgear Health Index

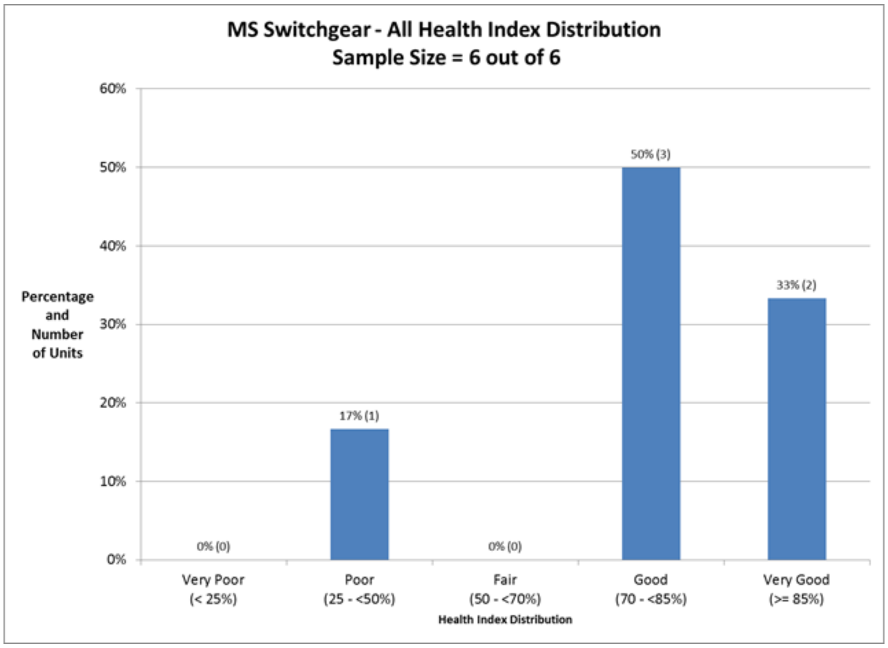
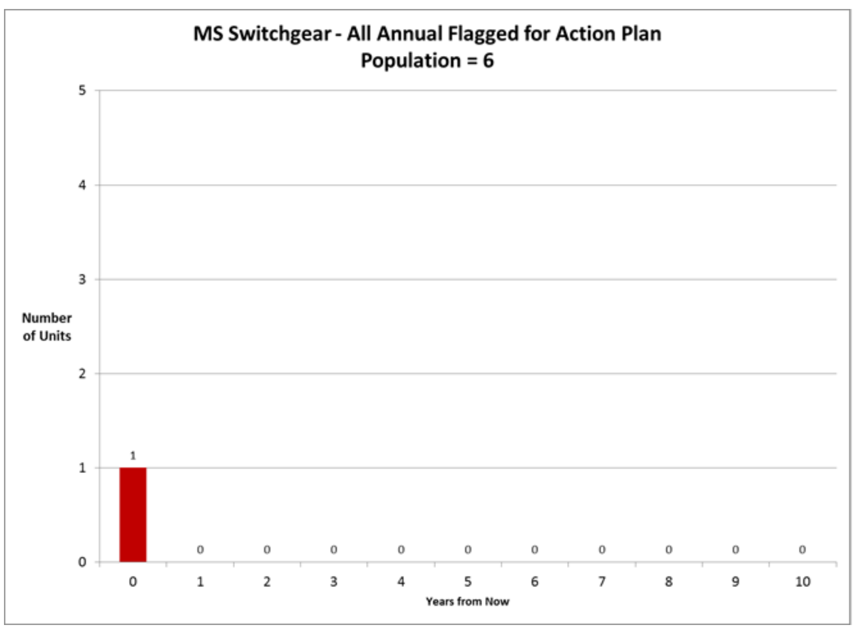


Figure 72: Flagged for Action Plan – 5.3.2 Overview of Assets Managed



Asset Condition Assessment MS Load Switches

There are a total of 6 MS Load Switches, one at each station. The average age of the MS Load Switches was 25. There was sufficient data provided to determine a Health Index for 5.3.2 Overview of Assets Managed including age, contact resistance, insulation resistance test results, and visual inspection records. Data gap was limited to historic removal record. The average Health Index for MS Load Switches was 75%.

Figure 73: MS Load Switches Age Distribution Information

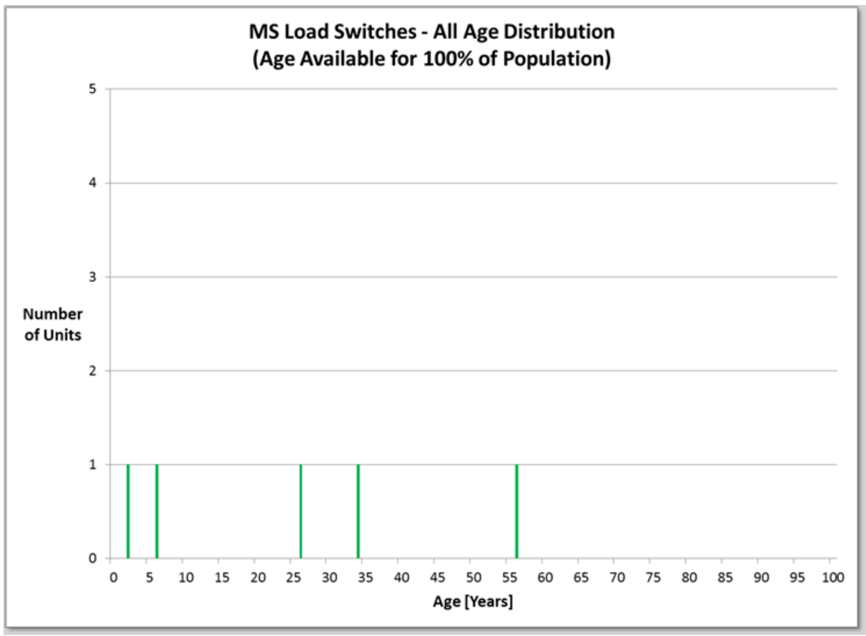


Figure 74: MS Load Switches Health Index

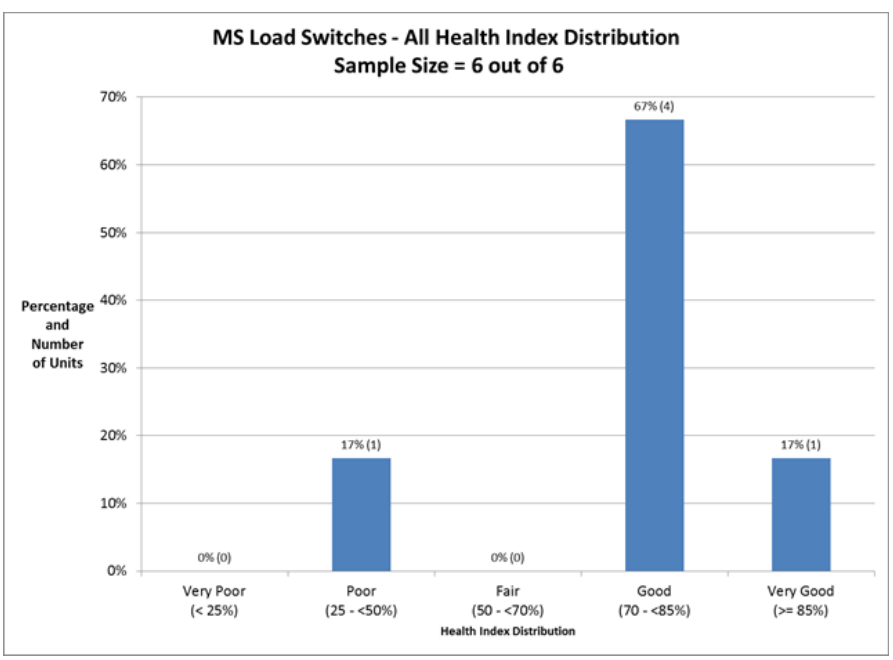
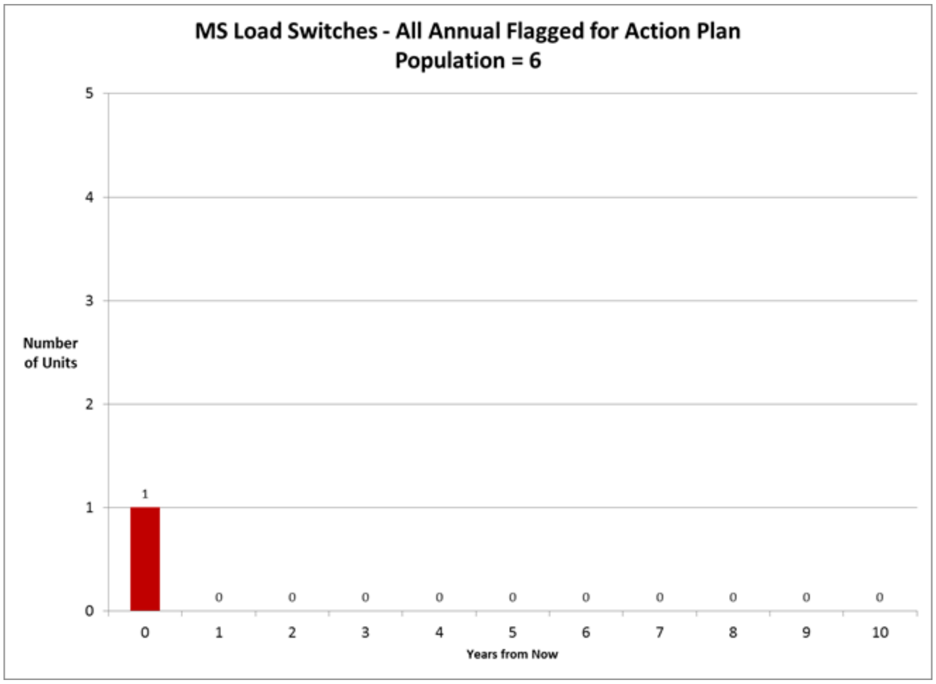


Figure 75: Flagged for Action Plan – MS Load Switches



5.3.2c Pad Mounted Transformers

There are a total of 145 Pad Mounted Transformers. The average age of the Pad Mounted Transformers was 23. There was sufficient data provided to determine a Health Index for Pad Mounted Transformers including age, overall inspection and infrared test results. Data gaps included physical condition, connection and insulation condition, gasket, loading, and historical removal record. The average Health Index for Pad Mounted Transformers was 78%.

Figure 76: Pad Mounted Transformer Age Distribution Information

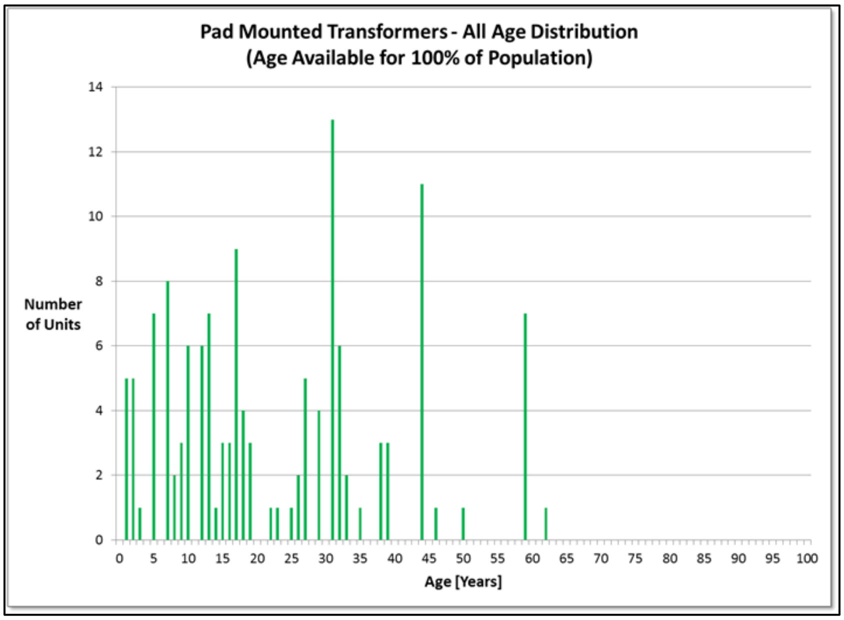


Figure 77: Pad Mounted Transformer Health Index

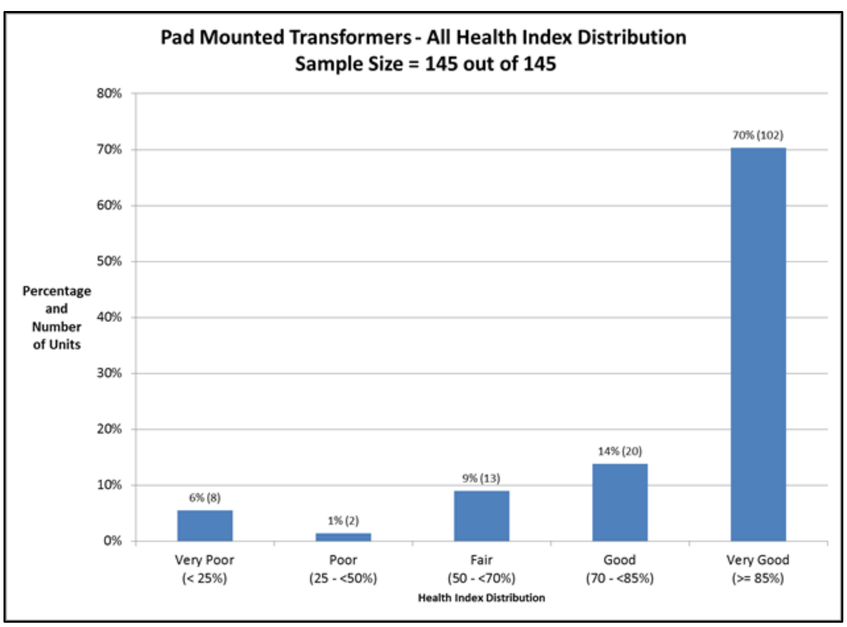
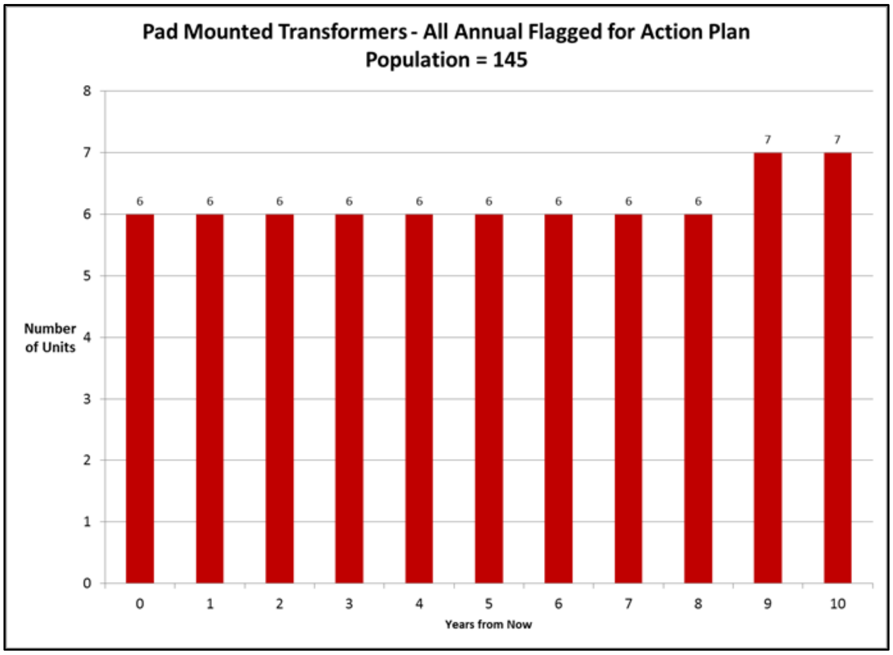


Figure 78: Pad Mounted Transformer Flagged for Action Plan



5.3.2c Pole Mounted Transformers

There were a total of 458 and 64 units of single phase and three phase respectively. The average age for Pole Mounted Transformers 1-Phase and 3-Phase was 25 and 18. All of them had sufficient data for a Health Indexing which included age, overall inspection and infrared test results. Data gaps included physical condition, connection and insulation condition, loading, and historic removal record. The average Health Index scores for this asset group were 68% and 74%,

Figure 79: Pole Mounted Transformer Age 1-PH Distribution Information

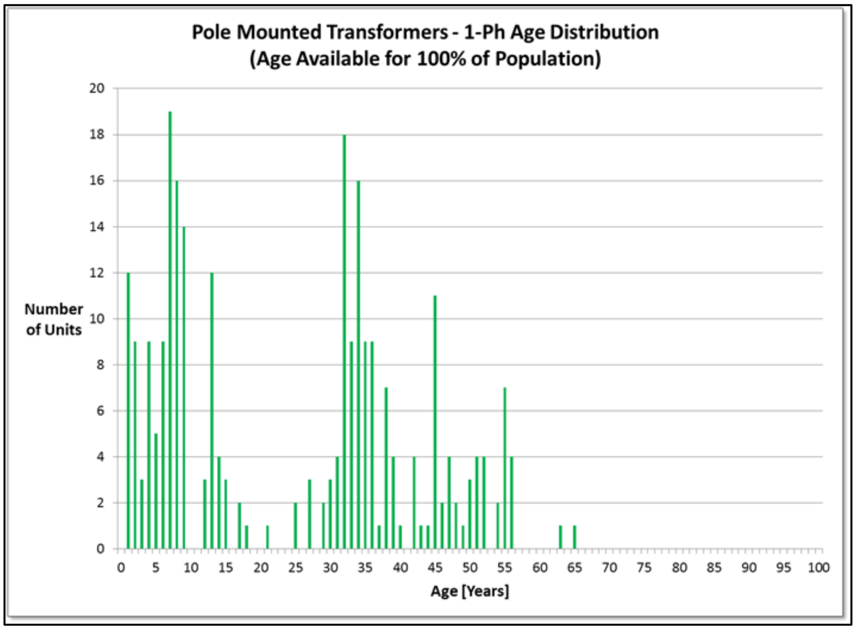


Figure 80: Pole Mounted Transformer Age 3-PH Distribution Information

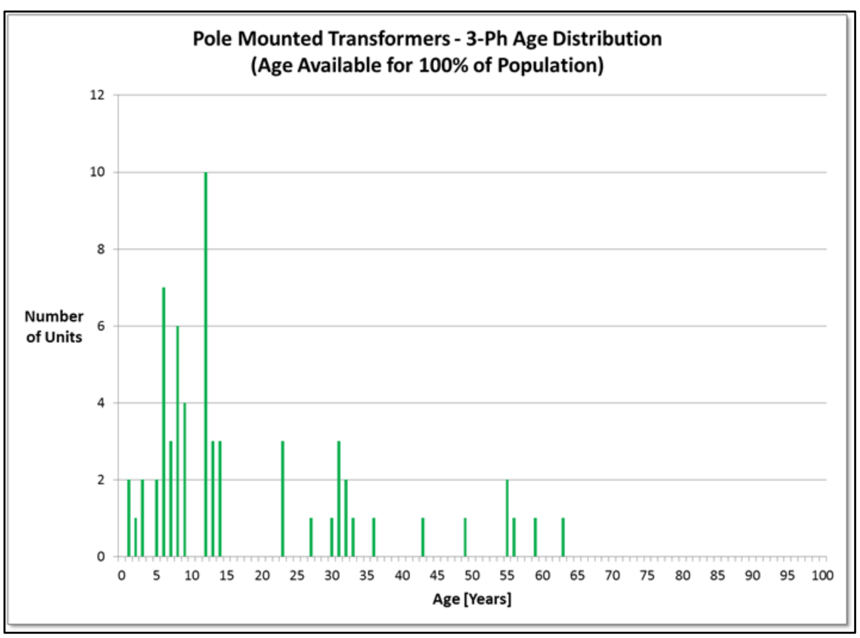


Figure 81: Pole Mounted Transformer 1-PH Health Index

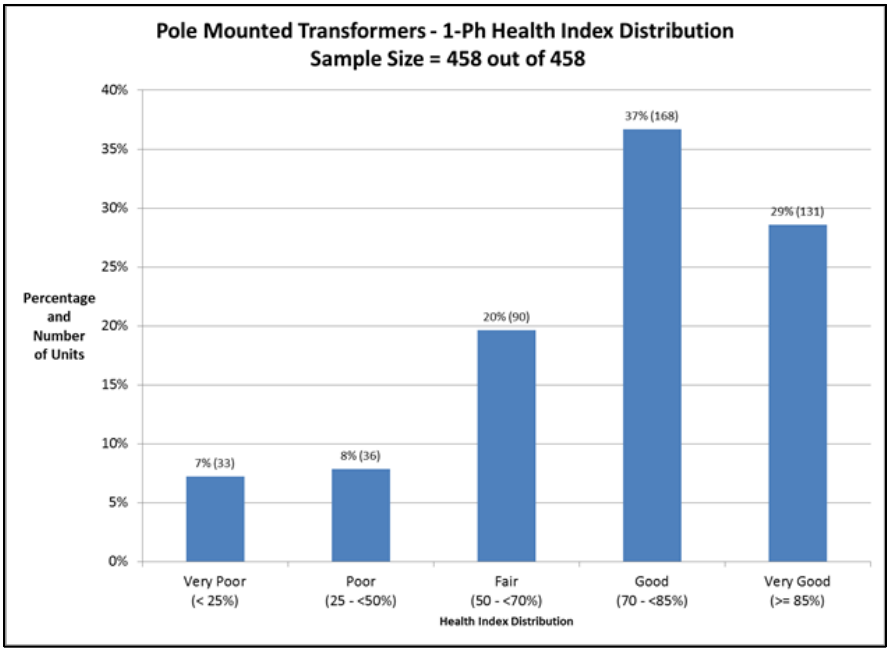


Figure 82: Pole Mounted Transformer 3-PH Health Index

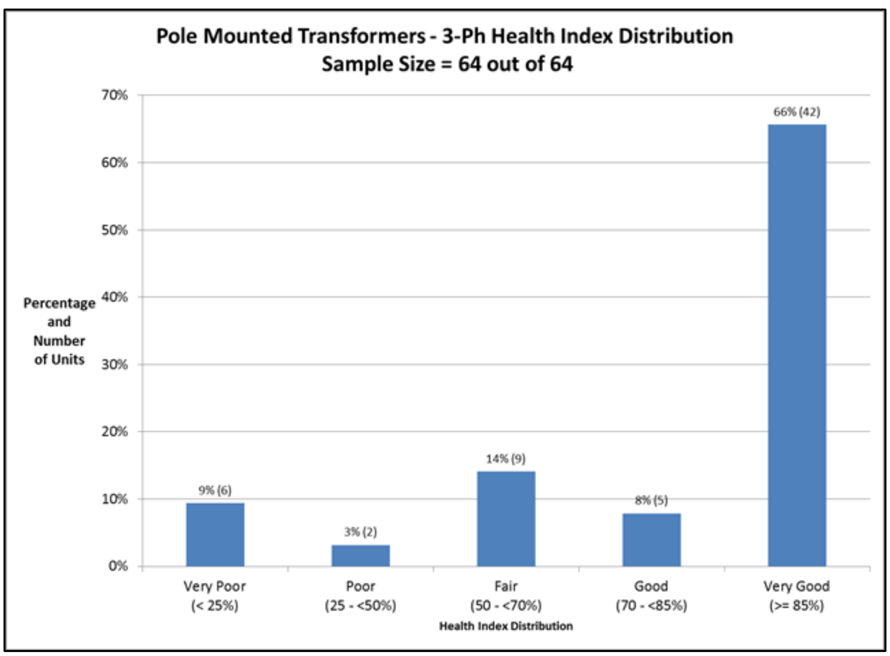


Figure 83: Pole Mounted Transformer 1-PH Flagged for Action Plan

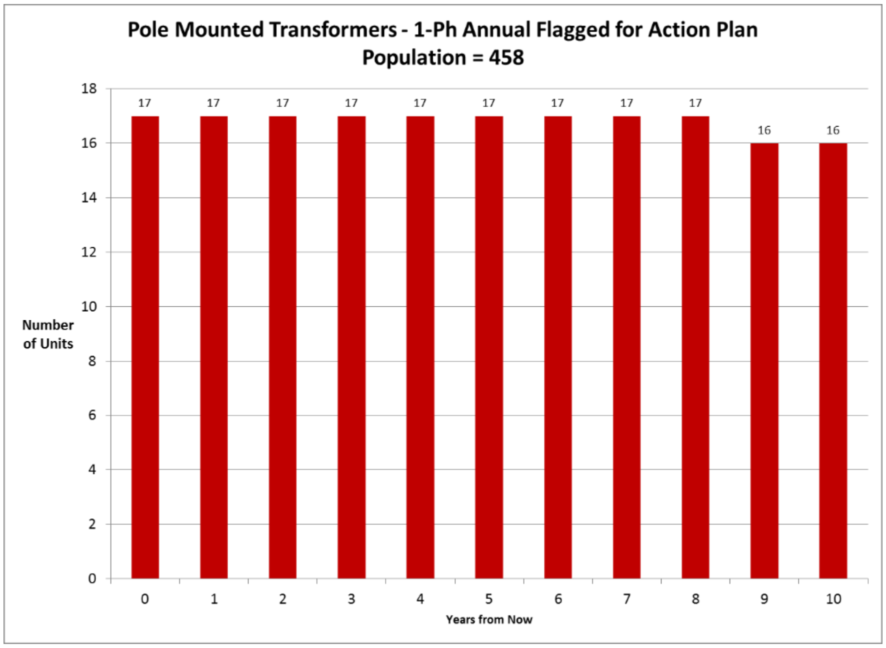
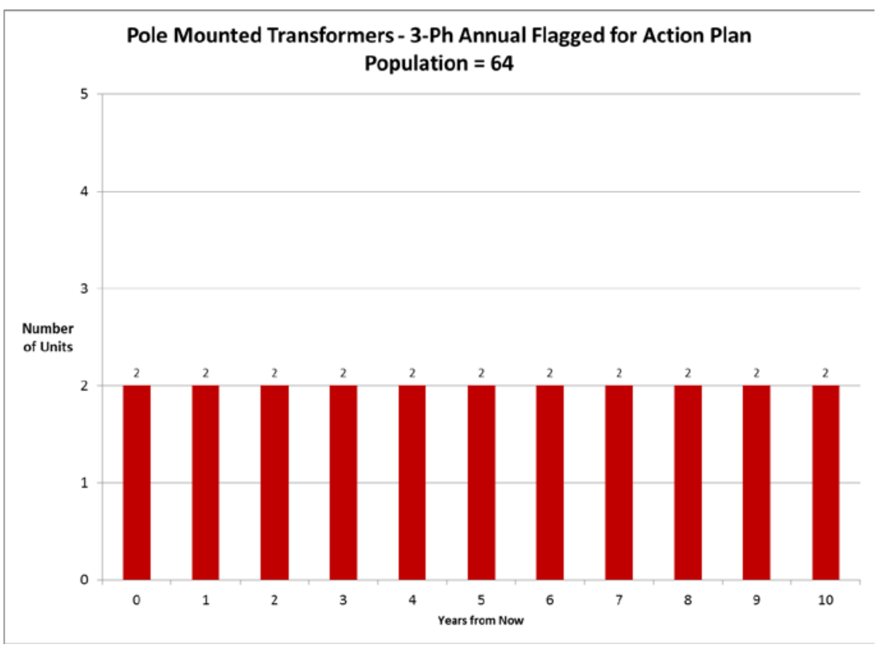


Figure 84: Pole Mounted Transformer 3-PH Flagged for Action Plan



Transformer Capital

A number of units are replaced annually, as part of projects driven by ongoing system renewals, wherever possible these replacements occur in parallel with other work being done on the same portion of the circuit.

5.3.2c Poles

The overhead distribution system is supported by approximately 1,890 primarily wood type poles. These poles are divided throughout the towns of Arthur, Holstein and Mount Forest. Historically, prior to the use of GIS, little pole information was recorded or maintained.

WNP completes system patrols on a yearly basis. The patrol includes a visual inspection of the poles looking for visible signs of damage or a leaning pole. In addition to visual inspections, poles are tested every three years meeting the requirements of the DSC.

In 2016, in order to obtain quantitative results, Wellington North Power purchased a Polux 5 Pole Tester. Poles are tested every three years and therefore it can be said that the program is still in its infancy stage. WNP continues to develop the improved pole testing process. Currently, the results are used to provide input into the capital plan primarily for the following year, that is, poles with a “red” result are planned for replacement. The implementation of the Polux testing is an improvement from WNP’s 2015 DSP Plan where the hammer test was used to inspect poles.

There are a total of 1581 and 309 Poles for 4kV and 44kV respectively. The average age of the Poles was 23 and 18 years. There was sufficient data provided to determine a Health Index which included age and pole inspection status condition. Data gap included pole accessories and historical removal record. The average Health Index for Pole was 84% and 86%.

Figure 85: Pole 4 kV Age Distribution Information

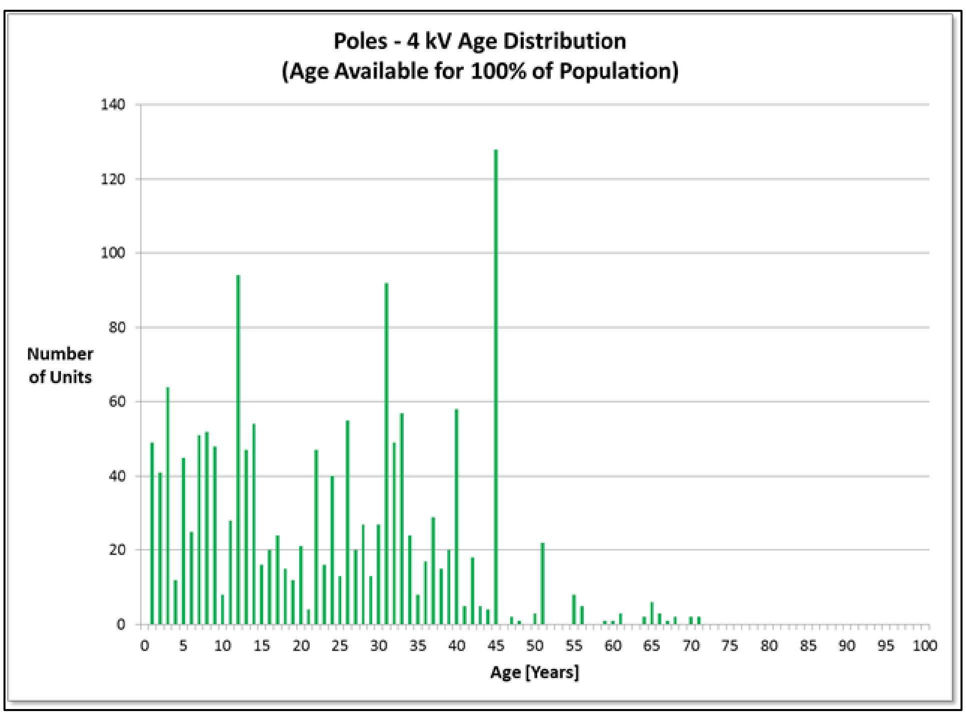


Figure 86: Pole 44 kV Age Distribution Information

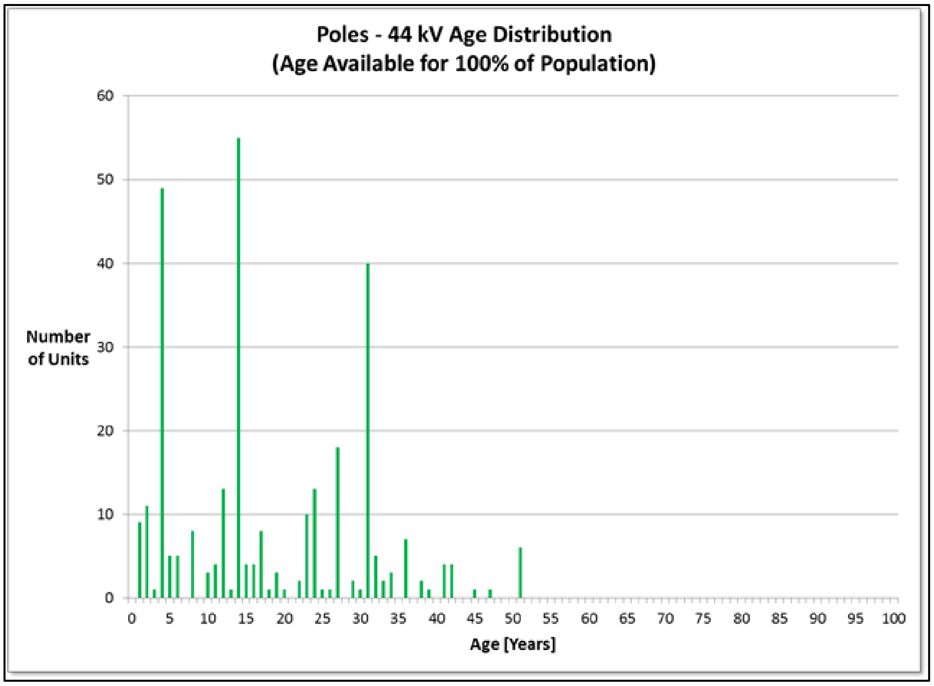


Figure 87: Pole 4kV Health Index

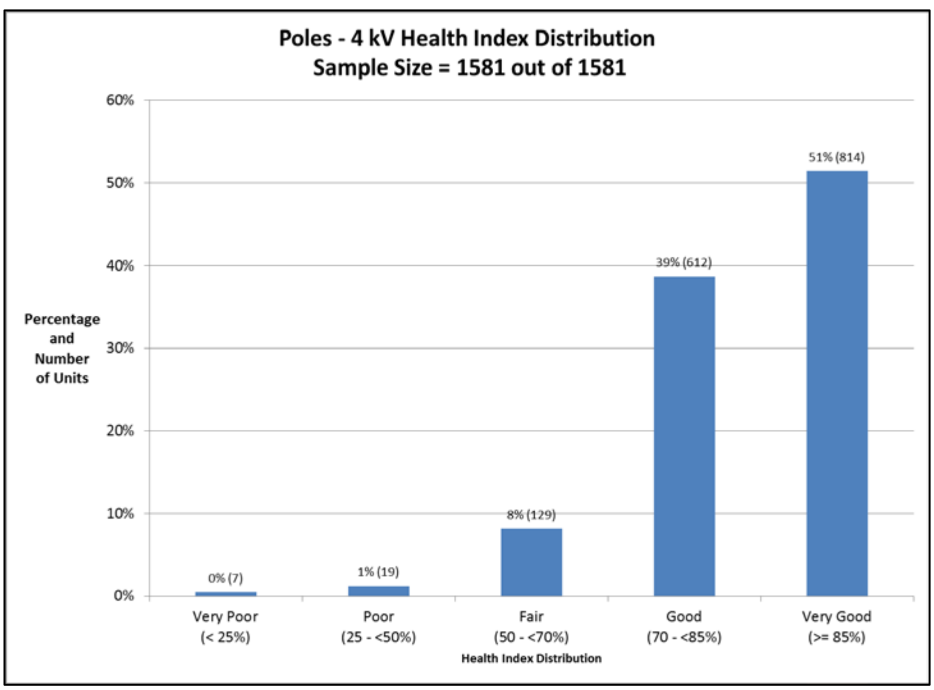


Figure 88: Pole 44kV Health Index

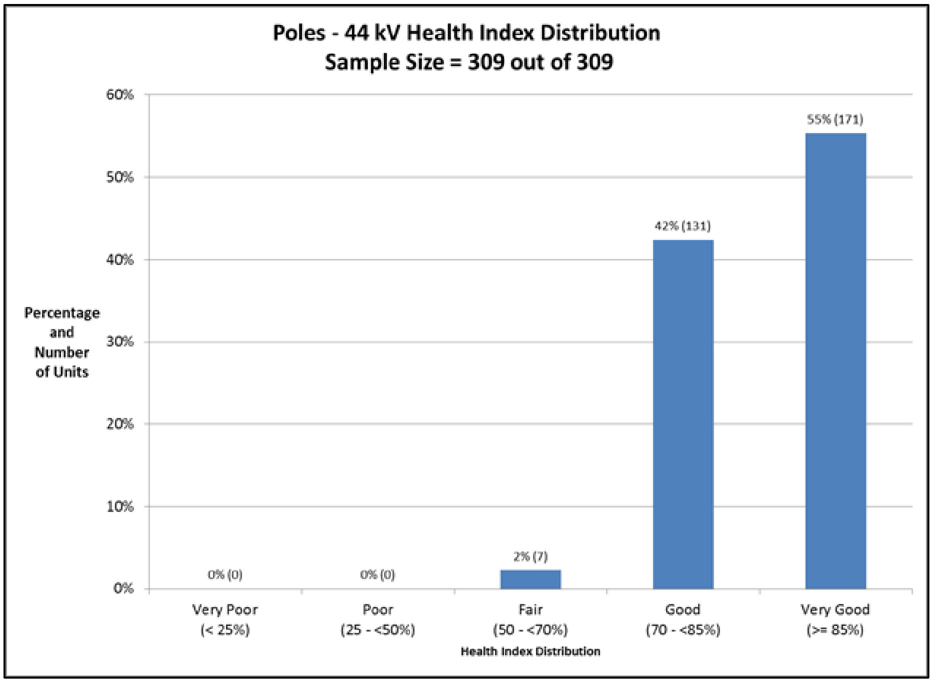


Figure 89: Pole 4kV Flagged for Action Plan

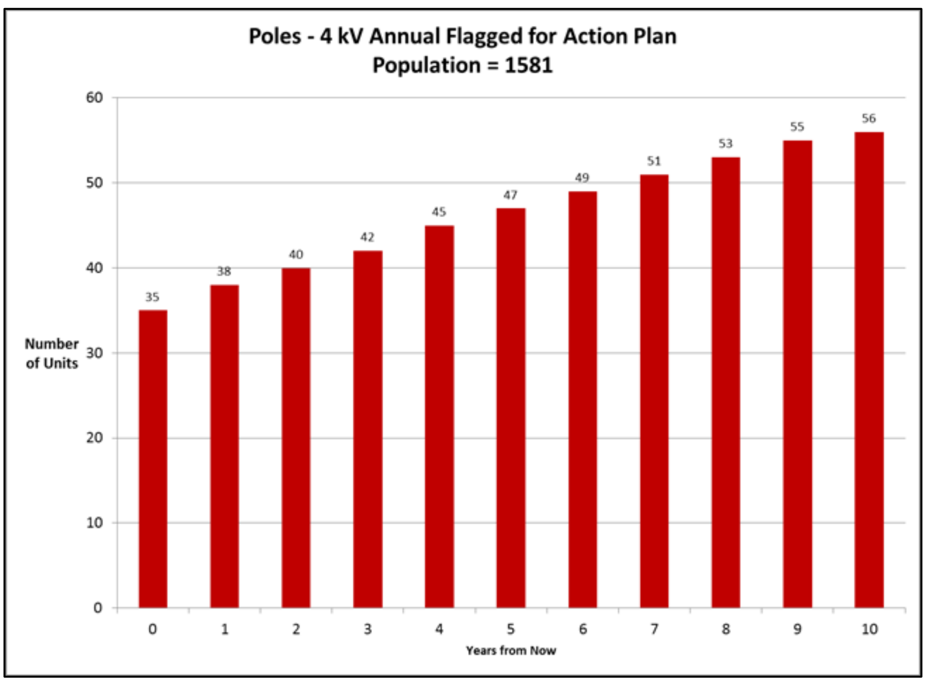
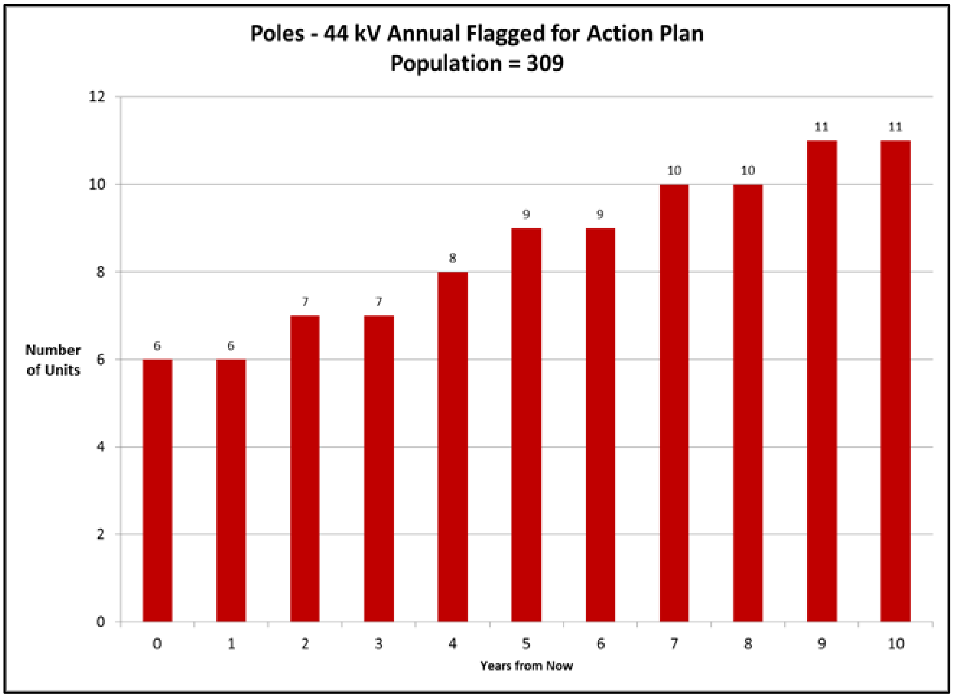


Figure 90: Pole 44kV Flagged for Action Plan



Pole Capital

A number of poles are replaced annually, as part of projects driven by ongoing system renewals, wherever possible these replacements occur in parallel with other work being done on the same portion of the circuit. In addition, failed poles identified during pole testing are replaced.

5.3.2c Switches and Cutouts

WNP uses switches and cut-outs to provide switching and control to Arthur, Holstein, and Mount Forest at the applicable voltages.

Loadbreak Switches

There are three gang operated load break switches in the distribution system (Excluding MS Substations). The switches were installed in 2019 to provide for safer switching operations between MS substations. Solid blade single blade switches were typically used.

Cutouts and Non-Loadbreak Switches

WNP uses fused cutouts on all its transformers and branch circuits for the control, sectionalization and downstream protection coordination of its 8.4kV and 4.16kV systems. Cutouts are used in single, two or three phase installations with two phase installations being the least common. Given the mixture of overhead and underground infrastructure in the WNP system, cutouts are commonly found providing isolation between the two.

Solid blade switches installed in cutouts and inline switching units are used for switching between circuits and isolation.

Switch and Cutout Capital

The switches will facilitate switching operations between the two feeds. The project is subject to approval.

Cutouts and solid blade disconnects will be added in new developments and system upgrade projects as identified in the WNP capital plans.

5.3.2c Conductor

Primary

The distribution system managed and maintained by WNP consists of overhead and underground conductor at 44kV, 8.32kV and 4.16kV with single phase taps of 4.8kV and 2.4kV.

Overhead

WNP has standardized on the following conductor sizes (typical):

1. 556 AAC 44kV Subtransmission
2. 336 AAC 8.32kV and 4.8kV

Underground

Underground construction is now used for new developments. WNP has installed all of its underground primary cable in conduit for protection and ease of replacement. WNP installs conduit using either open trenching or directional boring. Open trenching is used in new developments or where the disturbance of the surface is not a concern. Directional boring is used by contractors in built up areas for road crossings. WNP has standardized on the following Cable sizes for underground construction.

1. 250MCM Cu Station Feeder
2. 1/0 Radial feed or single phase streets

Secondary

Secondary voltages range from 240/120V single phase to 600/347V three phase. Secondary Bus is not always replaced when one customer upgrades their service, should a number of customers supplied by the same transformer upgrade, the secondary would be assessed and replaced based on current standards.

Underground secondary conductor and services are installed in either 75mm or 100mm DB-2 conduit in accordance to the Utility Standard Forum (USF) document 12-001. WNP performs trench inspections prior to backfill to ensure the standards are adhered to by the developers.

WNP has standardized on the following conductor sizes for single phase applications:

1. 3/0 Secondary Bus
2. #2 Residential Overhead
3. 1/0 Residential with road crossing
4. 3/0 Underground residential

Conductor Capital

Portions of conductor are replaced annually as part of projects driven by ongoing system renewal. These replacements occur in parallel with other work being done on the same portion of the circuit.

5.3.2c Metering and Monitoring

WNP owns and maintains approximately 3,800 meters installed on its customers' premises for the purpose of measuring energy consumption of electricity for billing purposes. Meters vary in type by customer and include meters capable of measuring kWh consumption, kW demand and kVA, as well as hourly interval data. WNP invoices its customers monthly, on a calendar billing cycle.

Wholesale Metering

WNP receives its power from HONI by three 44kV sub-transmission feeders and an 8.3kV distribution feeder. The four feeders are metered at the borders of Arthur (44kV), Mount Forest (44kV x 2) and Holstein (8.3kV).

Retail Metering

WNP uses Elster meters across its service territory and has contractual agreements with:

- Rodan Energy Solutions as the LDC's Meter Services Provider (MSP);
- Savage Data Systems for Operational Data Store (ODS) which involves the validation, estimation and editing (VEE) of metered data;
- UtiliSmart as the LDC's appointed Advanced Metering Infrastructure (AMI) Operator and;
- UtiliSmart for settlement services and web presentment of Wholesale, Retail, Embedded Generation interval data.

Smart Meters

All Smart metered interval data (Residential and General Service <50kW customers) is provided to the Meter Data Management and Repository (MDM/R) who process, store and manage the data. The MDM/R metered data is shared with the LDC who, with support from Savage Data Systems, validates the interval usage and ensures completeness of data.

In 2017, 2018 and 2019, WNP sampled a population of Smart Meters for accuracy in accordance with Measurement Canada requirements due to the meters approaching a seal life of 10 years. The results from the sampling were good meaning the Smart meters were sealed for use for a further 6 years.

In its' 2015 DSP, WNP had planned to replace all its' Smart meters during 2017 to 2019 as the meters were approaching 10 years old. WNP opted to re-verify its' Smart meters (i.e. extend their life rather than replace.

MicroFIT/FIT

MicroFIT/FIT interval metered data follows the same routine process as Smart meters, with the exception that the data is not sent to or stored in the MDM/R.

Over 50kW Meters

General Service 50-999kW (GS50-999kW) and General Service 1,000-4999kW (GS1000-4999kW) interval metered data and meter readings are transmitted by telecommunications each night. Each meter is dialed and the data is downloaded into MV90 and shared with Utilismart.

MIST Meter

WNP is compliant to the "Metering Inside the Settlement Timeframe" (MIST) requirement[18]. All existing services with a monthly average peak demand during a calendar year of over 50kW has had a MIST meter installed. WNP started installing MIST meters to customers in its' General Service 50-999kW rate class in September 2017 and completed the project in early January 2018. Any new services with a projected average peak demand of over 50kW during a calendar year had a MIST meter installed.

Meter Capital

WNP has included the following its' 2021-2025 capital investment program:

- Meter Replacement: Replacement of failed Smart meters (i.e. typically due to condensation).
- Wholesale Metering: - replacement of or refurbishment of wholesale meters and equipment in accordance with MSP's Wholesale Metering Program. This is listed under the item "Wholesale Metering Program".

[18] Section 5.1.3 of the DSC & EB-2013-011: A distributor shall (a) install a MIST meter on any new installation that is forecast by the distributor to have a monthly average peak demand during a calendar year of over 50 kW; and (b) have until August 21, 2020 to install a MIST meter on any existing installation that has a monthly average peak demand during a calendar year of over 50 kW.

5.3.2c General Plant

Transportation Equipment

The vehicle replacement program is based on annual condition surveys and life cycle planning. New vehicles and equipment support productivity through innovation, improve crew response time, reduce fuel costs, lower maintenance costs, and increase environmental responsibility through fuel reduction and alternate fuel usage. Consideration is given to the amount of mileage on the vehicle, body shape and if there are costly repairs prior to replacement.

Allowing for the historical usage and track record of the previous fleet types of vehicles, the following replacement schedule is used as a guide:

- Pickup Trucks: 8 Years
- Bucket Trucks 10 Years
- RBD Trucks 12 Years

- **Vehicles less than 3 tons**

Investigate and price suitable vehicles from the selection of dealerships in the immediate area. Consider the purchase of an older model depending on the mileage, condition or prior use of the vehicle and price quoted.

- **Vehicles over 3 tons:**

Ensure vehicles meet functional requirements to meet the near term and expected long term requirements. In order to achieve a lower cost, explore the following:

- Initially investigate the known manufacturers that meet the specifications and requirements that may have an existing used or demonstration vehicle in their inventory.
- If no suitable vehicle is available, prepare a specification list and proceed with a request for quotes.

The table below shows the current fleet vehicles by age and planned replacement year:

Figure 91: Fleet Age and Planned Replacement Year

Vehicle Desciption	Model Year	Planned Replacement	Typical Replacement (years)	Comments
Pick Up	2015	2023	8	High Usage
Pick Up	2017	2025	8	High Usage
Pick Up	2019	2027	8	High Usage
Single Bucket	2020	2030	10	High Usage
Double Bucket	2013	2026	12	Extend Replacement
RBD	2004	2022	12	Extend Replacement

WNP has included the fleet vehicles that are planned to be replaced from 2021 to 2025 in its' capital investment program for the period 2021-2025.

5.3.2c Information Systems, Operational Technology and Cyber-Security

In 2019, WNP completed a review of the current and future business requirements and priorities concerning the utility's capital investment in Information Systems. The requirements include replacement of hardware assets that are reaching the end of their useful life; software where applications are becoming dated; office equipment (e.g. printers and telephones); the anticipated needs of customers (e.g. ability to download usage history); compliance requirements (e.g. AODA[19] compliant website); and cyber-security investment over the next five year period (2021-2025) as illustrated in the table below:

Figure 92: IT Projected Expenditure (2021 – 2025)

Non Cyber-security	2021	2022	2023	2024	2025
Servers	$63,000	$0	$16,000	$26,000	$5,250
Smart Meter Infrastructure	$19,200	$0	$0	$0	$0
Desktop computers; Laptops & Accessories	$7,200	$13,050	$12,050	$9,100	$1,250
SCADA	$15,000	$0	$0	$66,500	$0
Smart Technology	$10,000	$10,000	$10,000	$10,000	$10,000
Office Equipment	$6,000	$17,500	$20,900	$6,200	$18,000
Projects - Software Replacement / Upgrade	$16,000	$130,000	$50,000	$0	$97,500
Total	$136,400	$170,550	$108,950	$117,800	$132,000
Cyber-security	**2021**	**2022**	**2023**	**2024**	**2025**
Network / Firewall	$14,100	$0	$5,000	$32,000	$0
Cyber-Security	$12,500	$10,000	$0	$10,000	$10,000
Total	$26,600	$10,000	$5,000	$42,000	$10,000
Annual Total	**$163,000**	**$180,550**	**$113,950**	**$159,800**	**$142,000**

The planned IS expenditure has been included in the LDC's five-year Capital Investment plan which is detailed in Section 5.4.

Summarized below is an overview of the current Information Systems (IS) infrastructure and Operations Technology (OT) in place at WNP.

o **Information System Technology:**

WNP retains the service of a local company to provide the required expertize for its' IS hardware and system networks. In the LDC's opinion, this relationship is effective and a cost efficient solution while not having the expense of maintaining a full-time IS resource. This cost effective relationship has enabled WNP to meet all required system changes and mandates quickly. WNP has met all regulatory or government mandates, within the required timelines (for instance, purchasing, installing and implementing Smart Meters across the LDC's service area; and, testing and implementation of a web-hosted solution for consumers to view their energy usage and bill payment history).

[19] Accessibility for Ontarians with Disability Act (AODA)

o **Cyber-Security:**

The Ontario Cybersecurity Framework[20] is a requirement of all Ontario LDCs to provide the OEB with information pertaining to their Cybersecurity and Privacy Maturity implementations. This requirement includes a self-assessment tool directly mapped to privacy and cybersecurity controls, utilizing the NIST Framework for Improving Critical Infrastructure Cybersecurity, which in turn is used as a guide to create and enforce new policies and procedures, to ensure technological improvements via capital investments, and to ensure a continuous improvement path is in place.

WNP has embarked on a 5-year plan to meet all requirements and has made substantial headway in the first 3 covenants of the framework: Identify, Protect and Detect. First, WNP retained the services of a Cybersecurity consultant to evaluate current practice and infrastructure against the assessment tool, and to provide a path forward utilising the framework as the roadmap. Each requirement was then mapped to specific framework-based actions and procedures, from policy to technology investments. These enhancements and investments include such things as:

- Senior Management Governance Policy and Support
- Complete mapping of all privacy related data, ensuring retention and protection is top of mind.
- Employee Training within Cybersecurity.
- Enhanced cyber protection agreements from anti-virus to malware to phishing protections, with full email based advanced threat protection capabilities.
- Full IT and OT inventory including network infrastructure documentation.
- Legacy equipment (Capitol) replaced with industry standard devices such as Firewalls, Switches and AP's, all providing cloud-based monitoring and detection capabilities.
- Physical Network segregation and Least Access Policies

To validate the work and investment to date, a 3rd party Cyber Audit was undertaken in 2017 and 2019. This intensive and expansive process was used to validate the many enhancements and to identify areas of potential improvement to further protect privacy, financial data, and in turn, shareholders and the cyber health of the company. From this audit, a multitude of software protection practices and protocols were implemented, substantially hardening the landscape cybersecurity footprint.

In keeping with the Cybersecurity Continuous Improvement mandate, WNP joined the IESO's Lighthouse project. This investment by WNP is in support of the CCA (Central Compliance Authority) as recommended by the governing board of the framework. This additional layer of protection also allows the reporting on the status of the framework implementation without sharing cyber security protection design. This additional layer was only possible with the capital investment in network hardware, the upgrading of legacy equipment to current levels.

[20] "Ontario Cyber-Security Framework" (version 1.0), December 6, 2017

The path forward will consist first of further refinement of the multitude of investments and procedures and will then move to the other two covenants of the framework, Respond and Recover. As these final two areas of the framework incorporate and leverage all prior investments, the solid base achieved to date will provide an exceptionally effective foundation to further enhance cyber-security and Privacy mandates, and will ensure a successful completion to the Ontario cyber-security Framework within the targeted timeframe.

o **Business Continuity:**

The goal of the business continuity and disaster recovery plan is to ensure immediate, secure and seamless access to company data and applications in the event of an emergency. Data and copies of software applications are stored in a back-up solution that is on the server as well as a cloud-based solution.

o **Information Systems – Strategy**

Information technology (IT) and Operation Technology (OT) expenditures ensure business goals are aligned to technological solutions as well as meeting privacy and cyber-security obligations. These expenditures include hardware, network infrastructure, switches, servers, equipment, workstations, tablets, laptops, printers, projectors, telephone and telecommunications, software, including licensing and web-based solutions. Ensuring business needs are met, including resiliency, redundant integration and implementation of secure solutions, to safeguard business continuity and sustainability.

Technical solutions address redundancy, business continuity and security. The company's Information Technology capital expenditures will ensure business continuity and redundancy to meet customer needs.

WNP ensures technical solutions contribute to fulfilling the OEB's established utility performance outcomes:

- Customer Focus: Technical solutions are provided in a manner that responds to customer needs and preference (e.g. Access to consumption and usage information, account information, billing information and company contact information.)
- Operational Effectiveness: Continuous improvement in the delivery of safe reliable electricity to customers with secure controls in place to strive for compliance of the OEB's cyber-security framework.
- Public Policy Responsiveness: Current and future technical requirements are reviewed and solutions developed to meet all obligations mandated by the government. This includes protection of Personable Identifiable Information (PII) to meet privacy standards.
- Financial Performance: Financial viability is maintained to ensure ongoing operational effectiveness.

IS and OT lifecycle encompasses investigation, requirement review and documentation, development, testing and procedural workflow, followed by end-user acceptance testing and training of employees.

WNP's has included IS investment within its 5-year Capital Investment Plan (2016 to 2020), with the objective of addressing the following business and customer requirements:

- ✓ Software maintenance and upgrade to meet regulatory obligations, customer value and operational efficiencies;
- ✓ Website update to extend life and enhance customer accessibility and focus on customer requirements to obtain information and data securely whilst protecting PII details;
- ✓ Review and enhance WNP's Business Continuity, Disaster Recovery risk mitigation plan;
- ✓ Workstation / laptop renewal and replacement;
- ✓ Printer renewal and replacement to meet end of life cycle;
- ✓ SCADA and distribution system communication; and
- ✓ Security Audits to responsibly address technical risk associated with loss of data, cyber security, policy review and internal / vendor controls.

5.3.2c Other Equipment

WNP has two building locations:

a) Arthur - an operations shop for storage of equipment and a bucket truck
b) Mount Forest - front-desk to serve walk-in customers and offices accommodating the workplace for staff, two truck bays to house fleet vehicles and two barns for storage of distribution equipment.

In its 5-year Capital Investment Plan, WNP has included building renovation costs as summarized below:

Figure 93: Projected Building Renovation Expenditure (2021 – 2025)

	2021	2022	2023	2024	2025
Building Renovation	$50,000	$0	$0	$65,000	$0

In WNP's 2012 Cost of Service application (OEB file number EB-2011-0249), there was OEB and Intervenor approval for the Applicant to secure financing through long-term debt to gut or build-new the building at the Mount Forest location. And, as per the Applicant's Decision and Order[21] , there was approval by all parties for:

> *"The Applicant removed $200,000 of capital investment planned for renovation and added $40,000 to pay for a Professional and independent assessment of WNP's main building at Queen St, Mount Forest. Independent assessment to assess whether the existing structure and foundations can be adapted to meet obligations and safety standards OR whether new-build is the more viable option".*

However, a 3rd party study completed in Q2 of 2013 and commissioned by WNP performed an assessment of the LDC's substations and identified deficiencies that required attention, especially given two substations were over 40 years old and hence the requirement of a strategy for replacement. As a result of this substation assessment, WNP prioritized building a new substation instead of a new office at Mount Forest. (The LDC filed an IRM application in its 2014 Distribution Rates application - file number EB-2013-0178 including an Incremental Capital Module (ICM) to replace and build a new substation (MS2 Substation). Application EB-2013-017 was approved and the Decision and Order of March 13th 2014 included approval of the ICM for WNP to proceed with replacing the aged and deteriorated MS2 Substation.)

With the above, some of the deficiencies identified in the building study commission by the LDC and filed with its 2012 Cost of Service rate application (EB-2011-0249) still persist and hence the inclusion of

[21] Decision and Order EB-2011-0249, page 16, Section 2.3: "Is the capital expenditure forecast for the test year appropriate?"

capital investment for building renovations / improvements over the next five years (2021-2025) to primarily address the following:

- ✓ Compliance with Ontario Accessibility Act for a washroom and building access for a person with disabilities (or less abled);
- ✓ Ability to navigate a stretcher throughout the building;
- ✓ Repairs to stop or prevent water leakages including replacing the flat roof that spans the whole office building; and
- ✓ Facilitate distancing and provide barriers to improve social distancing requirements.

5.3.2d Capacity of Existing System Assets

WNP is an embedded distributor fed by Hydro One Networks Inc. (HONI). Below, WNP has provided details regarding the capability from the Transmission Substation to the service area managed by the LDC:

- **Hanover TS**

Hanover TS, owned and operated by HONI, supplies power to the town of Mount Forest. This is done with one 44kV feeder carried by a pole line between Hanover and Mount Forest, a distance of over 40km. In 2016 an additional feeder from Palmerston TS was constructed to address load restrictions on the Hanover TS. The 44kV 36M5 feeder, under normal operations supply one 4.16kV municipal sub-stations and one customer owned station. The municipal sub-stations provide a distribution voltage of 4.16kV which is used to supply WNP's customers in the town of Mount Forest.

WNP also services the village of Holstein in Grey County. Holstein is serviced by WNP using an embedded HONI distribution feeder. Holstein DS, owned and operated by HONI, supplies power to the village of Holstein. This is done with one 8.32kV feeder designated as Holstein DS F3.

- **Palmerston TS**

Palmerston TS, owned and operated by HONI, supplies power to the Town of Mount Forest through feeder 28M2. In 2016, a new pole line to Mount Forest was designed and constructed to address the capacity constraint on the existing Hanover 36M5. Under normal operation the feeder supplies power to three 4.16kV municipal sub-stations and two customer owned stations.

- **Fergus TS**

Fergus TS, owned and operated by HONI, normally supplies power to the village of Arthur. The village of Arthur is supplied by the 73M1 feeder from Fergus TS. The alternate supply from HONI to the village of Arthur is the 22M2 feeder from Orangeville TS, owned and operated by HONI. These feeders are 44kV and supply WNP's two municipal sub-stations in the village of Arthur as well as four customer owned stations. These 5MVA sub-stations provide a distribution voltage of 4.16kV that is used to supply WNP's customers in the village of Arthur.

At this time, WNP has not received any load restrictions notices from HONI for the Fergus TS 73M1 or Orangeville TS 22M2 feeders.

- **Town of Mount Forest**

The distribution system in Mount Forest consists of two 44kV feeders, supplied by HONI and transformed by WNP using our municipal substations to a distribution level of 4.16kV. The distribution level voltage is used to transport power in town to WNP's residential and commercial customers. WNP connects some large industrial customers directly to the 44kV feeder.

- **Village of Arthur**

The distribution system in Arthur consists of one 44kV feeder, supplied by HONI and transformed by WNP using our municipal substations to a distribution level of 4.16kV. The distribution level voltage is used to transport power in town to WNP's residential and commercial customers. WNP connects some large industrial customers directly to the 44kV feeder.

- **Village of Holstein**

WNP has limited information with regards to this distribution circuit. WNP's PME would record data on load; however, WNP would have limited information about this distribution feeder.

During the next five years, no capacity constraints are anticipated on the distribution system requiring investments into capacity upgrades. The company's distribution system consists of 44kV, 8.3kV and 4kV circuits, six Municipal Substations (MS) and eight customer owned substations. The six MS's have a total of 20 4kV feeders with a total capacity of 27MVA available to meet the current and long term electrical demand and limited embedded generation connections.

As an embedded distributor, the LDC is not aware of any upstream capacity constraints at the Hydro One Transmission stations relating to the WNP supply feeders.

The utility has taken measures to address capacity concerns including:

Project Completed (2016):

The Town of Mount Forest is supplied by a two 44kV HONI M Class feeders. One feeder is from Hanover TS and is identified as 36M5. The seconder feeder from Palmerston, identified as 28M2 was constructed and energized in 2016 due to a capacity issue with the 36M5 as presented in Wellington North Power's 2015 DSP and included in the LDC's rate application (EB-2015-0110).

In Progress:

WNP's smart grid development initiative, involving equipping all the distribution stations with automated feeder reclosers and supervisory control and data acquisition (SCADA) system, has been started. Two of the stations are now equipped with automated and remote controlled reclosers, protected through SEL relays, allowing all features of the SCADA system to be fully utilized. Smart grid development initiative also includes upgrade and renewal of revenue meters to comply with the regulations.

The meetings with and reports from municipal government provide a good source of information for consideration in WNP's DSP 5-year capital plan. There is anticipated population growth in WNP's service area; however, over the period 2021-2025, the utility does not anticipate system capacity constraints or replacement of major assets (such as substations) to meet demand during this planning cycle.

Capacity

As noted above, in 2016, WNP completed the installation of a second 44kV Feeder to Mount Forest to address capacity constraints on its existing feeder. Through Regional Planning, WNP is not aware of any immediate concerns regarding capacity to Mount Forest, Arthur or Holstein.

The MS Substations have additional capacity to handle growth. Figure 94 shows typical loading during normal operation.

Figure 94: Feeder Capacity Typical – Normal Operating Conditions

Load Capacity Normal Operations						
Substation	**Station MVA**	**Feeder ID**	**Peek (Amps)**	**Design (Amps)**	**Typical Load (Amps)**	**Capacity (Amps)**
MS1	5.0	**F1**	400	200	145	55
		F2	400	200	70	130
		F3	400	200	65	135
		F4	400	200	60	140
MS2	5.0	**F1**	400	200	135	65
		F2	400	200	60	140
		F3	400	200	70	130
		F4	400	200	30	170
MS3	5.0	**F1**	400	200	50	150
		F2	400	200	70	130
		F3	400	200	65	135
		F4	400	200	45	155
MS4	2.0	**F1**	400	200	0	200
		F2	400	200	35	165
		F3	400	200	0	200
		F4	400	200	0	200
MS5	5.0	**F1**	400	200	65	135
		F2	400	200	50	150
		F3	400	200	60	140
MS6	5.0	**F1**	400	200	100	100
		F2	400	200	85	115

In WNP's opinion, supply and capacity of existing assets are adequate to sustain the forecasted load growth for the forecasted period 2021 to 2025.

5.3.3 Asset Lifecycle Optimization Policies and Practices

5.3.3a Asset Lifecycle Optimization Policies and Practices

Maintenance and Operating Activities

WNP's main distribution assets are stations, poles, primary and secondary conductors, transformers, and switches. All the distribution plant is inspected, at a minimum, on a three year cycle in accordance with the Distribution System Code requirements.

WNP performs a number of maintenance and operating activities to ensure the safe and reliable operation of the distribution system. These activities include but not limited to thermographic inspection, line patrols, pole inspections and substation maintenance.

Inspection

WNP has Engineering and Operations Policy 2030 Distribution System Inspection and Patrols that details our inspection practice for distribution system equipment. Inspections are audited annually within our Ontario Regulation 22/04 audit.

WNP has implemented and follows inspection and maintenance procedures in accordance with the Distribution System Code (DSC), Regulation 22/04, Sections 4 and 5, and ESA Guidelines.

All line patrols and inspections are documented. The asset inspection data and available device information is used to support maintenance activities and capital expense planning. Specific inspection and testing processes are dependent on the asset type.

With the use of their GIS asset management tool, WNP fully expects to continue to correlate asset condition data, asset maintenance and replacement expenditures and the resulting system performance indicators. These systems and their information will collaborate and support the experience of WNP staff.

MS Municipal Station Inspection

WNP conducts monthly visual inspections of its Municipal Substations in accordance with its Policy 2040 Distribution Substation Inspections. An Infrared Inspection of the station is completed on a yearly basis. In addition, a third party testing agency, is contracted to test and perform maintenance on the substation every three years. WNP meets the requirements of the DSC as well as ESA Regulation 22/04. MS stations include MS

Transformer Inspection

WNP visually inspects transformers during system patrols. In addition to visual inspection Wellington North Power covers all of its transformers in its annual infra-red inspections. These inspections look for hot spots on transformers and their primary/secondary connections.

The inspection of transformers includes:

Pole Mount Transformers:

- Paint condition and corrosion
- Phase indicators and unit numbers match operating map
- Leaking oil
- Flashed or cracked insulators
- Contamination/discolouration of bushings
- Ground lead attachments
- Damaged disconnect switches or lightning arresters
- Ground wire on arresters unattached

Pad Mount Transformers:

- Paint condition and corrosion
- Placement on pad or vault
- Check for lock and penta bolt in place or damage
- Grading changes
- Access changes (Shrubs, trees etc.)
- Phase indicators and unit numbers match operating map (where used)
- Leaking oil
- Lid Damage, missing bolts, cabinet damage
- Cable connections
- Ground connections
- Nomenclature
- Animal nests/damage
- General Condition

Transformer Maintenance

WNP performs maintenance on any transformers which are identified by either visual or infra-red inspection as needing work. This work may include replacement of connections if found to be hot, painting or replacement of unit if leaking.

Pole Inspection

WNP completes system patrols on a yearly basis. The patrol includes a visual inspection of the poles looking for visible signs of damage or a leaning pole. In addition to visual inspections, poles are tested every three years meeting the requirements of the DSC.

Switch and Cutout Inspection

WNP has been conducting switch inspection on all Gang operated switches every three years. Each year these switches are inspected for damage and wear.

Additionally Visual inspections are carried out on all switches as part of the Line Patrols and Thermographic Inspection Program.

- Bent, Broken bushings and cutouts
- Damaged lightning arresters
- Ground wire on arresters unattached

Inspection of underground switching equipment is also carried out on a three year cycle, in accordance with the Distribution System Code and includes the following:

- Paint condition and corrosion
- Check for lock and penta bolt in place or damage
- Grading changes
- Phase indicators and unit numbers match operating map (where used)
- Leaking oil
- Lid damage, missing bolts, cabinet damage
- Cable connections
- Ground connections
- Nomenclature
- Animal nests/damage
- General Condition

Records of inspection, recorded and stored in a digital format shall be reviewed and priority of follow up scheduling of maintenance and/or corrective action activities will be completed accordingly.

Switch and Cutout Maintenance

Non-gang operated switches are visually inspected according to the inspection program and are maintained as required.

WNP replaces cutouts upon failure and preemptively replaces porcelain cutouts with polymer cutouts when already working on the pole upon which the cutout is mounted.

Conductor Inspection

Line patrols are conducted annually in accordance with the WNP Procedures. The line patrols include a visual inspection of the following:

Conductors and Cables
- Low conductor clearance
- Broken/frayed conductors or tie wires
- Exposed broken ground conductors
- Broken strands, bird caging, and excessive or inadequate sag
- Insulation fraying on secondary

Hardware and Attachments
- Loose or missing hardware
- Insulators unattached from pins
- Conductor unattached from insulators
- Insulators flashed over or obviously contaminated (difficult to see)
- Tie wires unraveled
- Ground wire broken or removed
- Ground wire guards removed or broken

General Conditions and Vegetation
- Leaning or broken “danger” trees
- Growth into line of “climbing” plants
- Accessibility compromised
- Vines or bush growth interference (line clearance)
- Bird or animal nests

Vegetation and Right of Way
- Accessibility compromised
- Grade changes that could expose cable
- Excessive vegetation on right of way

Line Patrol

WNP patrols its entire distribution system every three years, in accordance with the WNP Engineering and Operations Policy #18 as well as the Distribution System Code. Distribution system line patrols are tracked using the "Record of Inspection". WNP line staff performs line patrols. WNP staff also inspects the condition of lines whenever they are working in an area.

In addition to (over and above the DSC requirements) the DSC requirements, WNP encourages its staff to continually inspect their local work area. Due to the size of the service area and the repetitive attention to localized areas in the day to day activities, attention is given to small issues before they can become problems. This proactive approach has resulted in a wealth of detail regarding system conditions that can be used in system planning to allow staff to proactively and predictively resolve system issues before they become problems.

In addition to visual inspections WNP conducts annual infrared scans. These scans are performed by a contractor. These scans allow WNP to identify problem areas and turn unplanned outages into shorter planned outages, or eliminate the outage completely. This is reflected in both WNP system reliability statistics and in the customer survey responses and feedback.

Overhead System - Line-Trimming

As part of the regular maintenance plan for the pole line assets, WNP schedules regular tree-trimming activities, as described below:

Vegetation and Right of Way control is required under the Minimum Inspection Requirements of the Distribution System Code and good utility practice. WNP has a relatively heavy mature tree cover where overhead hydro lines are in the proximity to trees. Tree contact with energized lines can cause the following:

- Interruption of power due to short circuit to ground or between phases
- Damage to conductors, hardware and poles
- Danger to persons and property within the vicinity due to falling conductors, hardware, poles and trees
- Danger of electric shock potential from electricity energizing vegetation

Care must be taken to balance the requirements of customers and stakeholders and safe and reliable operation of the distribution system.

Tree Trimming inspections have been incorporated into the other inspection programs included in this plan and additional verification will be performed by work crews in the area in which regular work is performed.

To mitigate direct contact between trees and distribution assets, WNP conducts tree trimming in accordance with the WNP Procedures. Depending on the size, shape and growth pattern of each tree species, the tree trimmers remove sufficient material from the tree to limit the possibility of contact during high wind situations. The WNP service area is trimmed on a two year cycle as per formal requirements and lead hand judgment. This work is primarily carried out by WNP employees, but contractors may be hired, based on cost and availability of resources.

All debris is removed and the site is returned to as-found condition. Any pole line damage or anomaly noticed by the tree trimming crew is reported to WNP"s Chief Operating Officer for remedial action.

Meter Inspection and Maintenance

All maintenance activities related to meters follow the requirements of Measurement Canada guidelines.

5.3.3b Asset Lifecycle Risk Management Policies and Practices

Risk management refers to the practice of identifying potential risks in advance, analyzing them and taking precautionary steps to reduce/curb the risk. WNP uses 4 approaches to manage a risk:

- Acceptance - accepting the consequences of the risk. This is often accomplished by developing a contingency plan to execute should the risk event occur.
- Avoidance - eliminating a specific threat, usually by eliminating the cause.
- Mitigation - reducing the expected effect of a risk event by reducing the probability of occurrence.
- Transference - handing the risk off to a willing and recognized 3rd party.

Risk responses are guided by the company's risk appetite and our capacity to minimize the risk from occurring. Some risks are controllable; some risks are out of WNP's control or ability.

For low value (replacement cost) or low risk distribution assets where like-for-like replacement is possible and incidents of failure are low, WNP uses the "Risk Acceptance" approach or run-to failure as a strategy. Assets commonly run to failure include distribution transformers, meters, underground cable in duct.

WNP uses the "Risk Avoidance" approach for higher value assets and/or where there is a lead-time to obtain replacement assets, for instance substation equipment. Risk avoidance occurs through good purchasing practices such as detailed product design to meet requirements, specific product specification with test results and warranty coverage.

Risk Reduction is the most frequently used mitigation strategy in asset lifecycle risk management. All assets carry with them an inherent risk of failure which increases over time as asset conditions deteriorate whilst the probability of failure increases. WNP's policies and practices (such as routine maintenance and inspection) reduce overall risk by taking incremental steps throughout all stages of the asset lifecycle process.

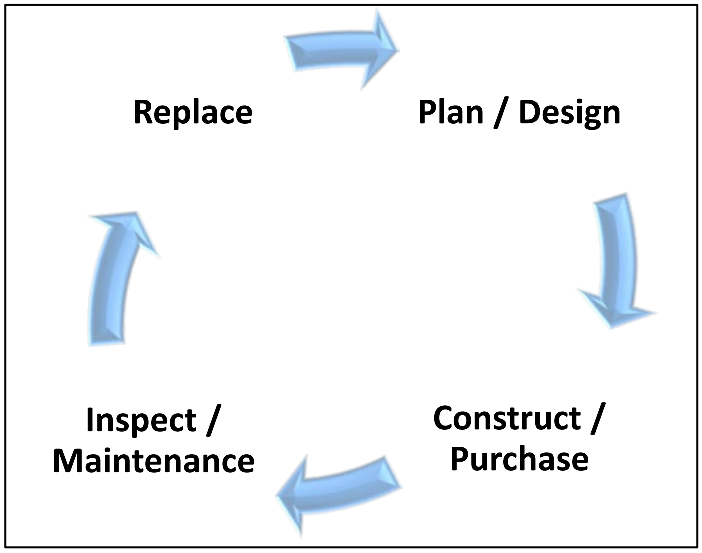
WNP has a number of policies and procedures to manage asset lifecycle risk management which are listed below:

Figure 95: Asset Lifecycle Risk Management Policies / Procedures

Policy / Procedure	Link to Asset Lifecycke Risk Management
2030 Distribution System Inspection & Patrols	Inspection / Maintenance
2040 Distribution Substation Inspections	Inspection / Maintenance
2060 Vegetation Management	Maintenance
2080 Used and Refurbished Major Equipment	Construction
2100 Approval of Major Equipment	Design and Construction

The elements of the asset lifecycle can be summarized as:

Figure 96: – Asset Lifecycle



- Plan / Design – WNP is a member of the Utilities Standard Form (USF) and uses USF engineering standards for planning and design purposes. The utility also refers to ESA guidelines for safety compliance.

- Construct / Purchase – For construction projects, e.g. pole-line projects, WNP will construct to the requirements of the USF engineering standards. WNP inspects all major construction for deficiencies as well as adherence to design standards. WNP has an excellent record with ESA in compliance to Ontario Reg. 22/04.
  For asset purchases, WNP uses detailed purchasing specifications, especially for high valued assets such as substation transformers.

- Inspect / Maintenance – during the in-service period, WNP routinely inspects assets to identify and mitigate risks. For example individual pole testing on a 3 year cycle using a Polux pole tester to measure the density of the asset.
  During inspections, information is collected about the condition of the assets which is fed into the Asset Management Process. For example, did the pole test indicate further degradation of the assets (i.e. less dense) and therefore should its' replacement date be earlier than planned?

- Replace - Review the asset condition when it is removed from service to gather information that may assist the planning and design stage. For instance, did the asset meet its life expectancy according to the Kinectrics "Service Life Comparison Tables"? If it didn't meet is life-expectancy period, why?

The WNP distribution system is relatively compact. The response to trouble calls and outages is within industry norms, as is evidenced by the performance indicators in Section 5.2.3. The need for remote control of switching equipment at this time is minimal.

In 2016, WNP replaced its' Hydro Monitoring system with new SCADA system. In addition to providing better monitoring and control, the system connects via ICCP to Hydro One Networks Inc. allowing WNP to monitor the 44kV circuit breakers which feed Arthur and Mount Forest enabling the utility to make better operational decisions.

WNP is able to monitor, in real time measurements, the voltage, current, power and energy.

Newly rebuilt municipal substations have reclosers on each feeder. The reclosers are connected to the SCADA system for monitoring and control. The recloser also provides enhanced safety for Powerline Technicians when working on the distribution system.

WNP plans to continue to implement reclosers in any future municipal sub-stations.

Capitalization Policy

WNP implemented the regulatory accounting changes to its capitalization policy effective January 1st 2012 as evidenced in the Applicant's last Cost of Service rate application for rates effective May 1st 2016[22]. No further changes have been made to the content of the capitalization policy since the last Cost of Service rate application.

WNP adopted the International Financial Reporting Standards (IFRS) on January 1st 2014 and transitioned to IFRS on January 1st 2015. The LDC adheres to IFRS, in particular the IAS 16, Property, Plant and Equipment conditions and regulatory accounting guidelines as set out in the Ontario Energy Board's Accounting Procedure Handbook. WNP does not capitalize interest on funds used during construction as capital projects are constructed. Furthermore, WNP does not capitalize, through internal cost allocations, any indirect administrative support costs such as Finance or Facilities.

[22] Wellington North Power Inc. Cost of Service EB-2015-0110 – Exhibit 2 / Tab 5 / Schedule 3 – Capitalization Policy (page 40 – 41) and Exhibit 4 / Tab 4 / Schedule 6.

5.3.4 System Capability Assessment for Renewable Energy Generation

5.3.4a Applications from Renewable Generators Over 10 kW for Connection

The FIT-size generator connection application process for WNP customers' requires the involvement of HONI. The application process includes an internal review of applications. WNP also requires approval from HONI for projects greater than 10kW for connection capacity, as HONI is the Host Distributor. The LDC is not aware of any upstream capacity constraints at the HONI owned Orangeville TS, relating to the WNP supply feeders.

WNP has limited penetration of its feeders to 10% of peak load. This is based on the 'Technical Review of Hydro One's Anti-Islanding Criteria for microFIT PV Generators' prepared by Kinectrics.

5.3.4b Renewable Generation Connections Anticipated Over the Forecast Period

- **MicroFIT / FIT**

Since the Ontario government announced the cancellation of "new" renewable contract in July 2018, WNP does not predict any new requests for renewable MicroFIT or FIT connections.

- **Net Metering**

WNP has not received any requests for connection of "net metering" in its service-territory.

Based upon the above information, WNP does not expect to reach the current available capacity for renewable generation in the near future (i.e. over the 5-year forecast horizon).

- **Smart Grid**

The company's distribution system consists of 44kV, 8.3kV and 4kV circuits, six Municipal Substations (MS) and eight customer owned substations. The six MS's have a total of 20- 4kV feeders with a total capacity of 27MVA available to meet the current and long term electrical demand and limited embedded generation connections.

5.3.4c Capacity of Distribution System to Connect Renewable Energy Generation

The existing capacity for each of WNPs feeders is illustrated in the tables below:

Figure 97: Renewable Generation Capacity by Station/Feeder

Arthur					
Station	**Feeder**	**Peak (kW)**	**Capacity (kW)**	**Connected (kW)**	**Remaining Capacity**
MS5	**F1**	900	90	20	70
	F2	905	91	10	81
	F3	615	62	10	52
MS6	**F1**	1200	120	10	110
	F2	900	90	10	80

Holstein					
Station	**Feeder**	**Peak (kW)**	**Capacity (kW)**	**Connected (kW)**	**Remaining Capacity**
Holstein	**F3**	500	50	0	50

Mount Forest					
Station	**Feeder**	**Peak (kW)**	**Capacity (kW)**	**Connected (kW)**	**Remaining Capacity**
MS1	**F1**	1060	106	0	106
	F2	790	79	0	79
	F3	495	50	0	50
	F4	635	64	10	54
MS2	**F1**	520	52	0	52
	F2	745	75	0	75
	F3	520	52	39.89	12
	F4	1250	125	10	115
MS3	**F1**	NA	NA	NA	NA
	F2	850	85	0	85
	F3	990	99	20	79
	F4	1625	163	140	23
MS4	**F1**	NA	NA	NA	NA
	F2	205	21	0	21
	F3	NA	NA	NA	NA
	F4	NA	NA	NA	NA

Based on 2013 Load Profiles (no significant load changes since)

- **Current Connection of Renewable Generation**

WNP has twenty-two (22) MicroFIT-size renewable generation projects connected to our distribution system at the 4.16kV level. WNP connected most of its' MicroFIT projects between 2010 and 2012, with one connection in 2015, one connection in 2016 and two connections in 2018.

WNP connected its first 100kW FIT-size renewable generation project in 2014. This project was connected to a customer serviced by a 500kVA pad-mounted transformer. A Connection Impact Assessment was completed by both WNP and Hydro One to ensure the proposed project would not cause technical issue when connected.

Hydro One offers a station capacity calculator that is available for renewable generation proponents to utilize when considering projects. In May 2014, this calculator was used by WNP to provide an indication of future capacity for FIT-size renewable generation within our service area. The results showed feeder Hanover 36M5, which supplies the Town of Mount Forest, having capacity for future FIT-size renewable generation projects and feeder Fergus 73M1, which supplies to Village of Arthur, not having capacity for future FIT-size renewable generation projects. All FIT-size renewable generation projects would require a Connection Impact Assessment that considers the technical feasibility of making a defined connection of renewable generation to WNP's distribution system.

WNP has additional capacity on its 4.16kV distribution system for the connection of renewable generation projects, subject to a successful WNP's and Hydro One's Connection Impact Assessment.

- **Methodology for Prioritization of Expenditures**

FIT or MicroFIT projects were prioritized by WNP on a first come first served basis.

The tables below illustrates WNP's renewable generation portfolio:

Figure 98: Summary of FIT Contract RG

Meter ID	Contract ID	LDC	Project City	Technology	Contract Capacity
WNGEN0023	F-000134-SPV-130-502	Wellington North Power Inc.	Mount Forest	Solar (Rooftop)	100

Figure 99: Summary of MicroFIT Contract RG

Meter ID	Contract ID	LDC	Project City	Technology	Contract Capacity
WNGEN0001	FIT-MPUEQ9Y	Wellington North Power Inc.	Mount Forest	Solar (PV)	10
WNGEN0002	FIT-M3KK6YQ	Wellington North Power Inc.	Mount Forest	Solar (PV)	10
WNGEN0018	FIT-M4AJ9FR	Wellington North Power Inc.	Mount Forest	Solar (PV)	10
WNGEN0006	FIT-MUQWTC9	Wellington North Power Inc.	Mount Forest	Solar (PV)	10
WNGEN0010	FIT-MDYBZNX	Wellington North Power Inc.	Mount Forest	Solar (PV)	10
WNGEN0014	FIT-MIM6FD9	Wellington North Power Inc.	Arthur	Solar (Non-Rooftop)	10
WNGEN0017	FIT-MF4CBDH	Wellington North Power Inc.	Mount Forest	Solar (PV)	10
WNGEN0004	FIT-M9NQPBC	Wellington North Power Inc.	Mount Forest	Solar (Rooftop)	10
WNGEN0007	FIT-MHYU4FV	Wellington North Power Inc.	Mount Forest	Solar (Rooftop)	10
WNGEN0008	FIT-MTZ4MFZ	Wellington North Power Inc.	Arthur	Solar (Rooftop)	10
WNGEN0009	FIT-MPUPXQ7	Wellington North Power Inc.	Mount Forest	Solar (Rooftop)	9.89
WNGEN0016	FIT-MVIGT88	Wellington North Power Inc.	Mount Forest	Solar (Rooftop)	10
WNGEN0011	FIT-MCYTATX	Wellington North Power Inc.	Arthur	Solar (Rooftop)	10
WNGEN0012	FIT-M9HPMKW	Wellington North Power Inc.	Mount Forest	Solar (Rooftop)	10
WNGEN0015	FIT-MYU78BI	Wellington North Power Inc.	Arthur	Solar (Rooftop)	10
WNGEN0013	FIT-MCXIT2R	Wellington North Power Inc.	Arthur	Solar (Rooftop)	10
WNGEN0022	FIT-ME8THFI	Wellington North Power Inc.	Mount Forest	Solar (Rooftop)	10
WNGEN0021	FIT-MV3MEVI	Wellington North Power Inc.	Arthur	Solar (Rooftop)	10
WNGEN0019	FIT-MGRGVUA	Wellington North Power Inc.	Mount Forest	Solar photovoltaic (Rooftop)	10
WNGEN0020	FIT-MFNU2XV	Wellington North Power Inc.	Mount Forest	Solar photovoltaic (Rooftop)	10
WNGEN0029	FIT-MC4EGGV	Wellington North Power Inc.	Mount Forest	Solar (Rooftop) (> 6 kW and < 10 kW)	7.5
WNGEN0030	FIT-M8B28DJ	Wellington North Power Inc.	Mount Forest	Solar (Rooftop) (> 6 kW and < 10 kW)	7.5

5.3.4d Constraints Related to the Connection of Renewable Generation

WNP is an embedded distributor – refer to 5.3.4e (below) for constraints related to the connection of renewable generation applicable to an embedded distributor.

5.3.4e Constraints for an Embedded Distributor Related to the Connection of Renewable Generation

The majority of connected renewable generation connections are in Arthur and Mount Forest and consist of rooftop FIT (one) and micro-FIT projects (twenty-two).

Larger projects will typically be installed by commercial and industrial customers with a large rooftop footprint. These types of structures are limited in the WNP service territory. In addition, the Renewable Generation (RG) load is at capacity on the HONI feeder to Arthur thereby preventing further development of RG FIT projects in Arthur.

5.4 Capital Expenditure Plan

5.4a Description of Customer Engagement Activities to Obtain Preferences

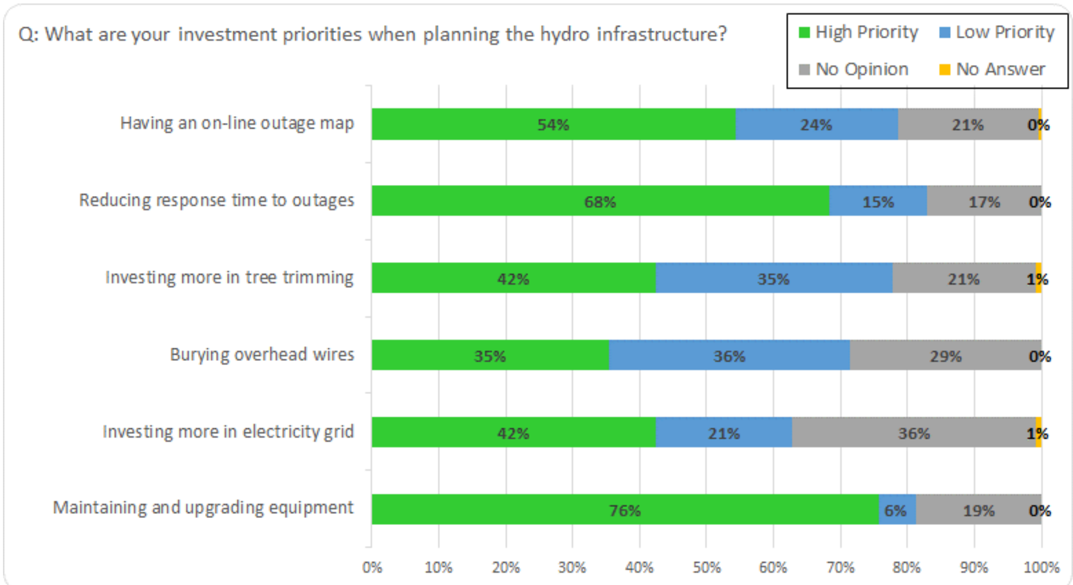
WNP attempts to engage with our customers to ensure their utility is meeting their needs and expectations both today and for the future. For WNP, customer engagement occurs in a variety of formats and locations including:

- Attendance at community events such as The Home show (Spring) and The Fall Show;
- Open houses and specific events – e.g. WNP hosted an open house for residents to listen to customers who may be affected by construction and traffic noise during the replacement of the LDC's substation in 2018;
- Invitation to present at Chamber of Commerce meetings;
- Meetings with Industrial & Commercial customers concerning capacity concerns, facility expansion plans and information regarding the Industrial Conservation Initiative;
- The bi-annual customer satisfaction survey; and
- Informal conversations including:
  - Front line staff and management listening to customers at the front desk;
  - Operations staff working with customers and contractors on day to day projects; and
  - Informal conversations with residential customers and business-owners as CSRs and operations staff perform activities in the community such as banking and collecting supplies.

A consistent message from our customers is for their local hydro company to continue to provide a reliable service and to mitigate cost increases while providing excellent customer service with responsible oversight.

In preparing its' 2020 DSP, WNP conducted surveys with Residential, Small Business and Industrial & Commercial customers (as described in "Section 5.2.2. Coordinated Planning with Third Parties") in Quarter 4 2019. Included in the survey was a question concerning investment priorities to help WNP ensure that our planning process for capital and maintenance work is in line with customer expectations. The collated results are illustrated in the chart below:

Figure 100: Customer Survey: Investment Planning Priorities



From the collated responses the top "high priority" statements for investment prioritization are:

1st - "Maintaining and upgrading equipment" - 76% of all respondents;

2nd - "Reducing response time to outages" - 68% of all respondents;

3rd -"Having an on-line outage map" - 54% all respondents.

Joint 4th - "Investing more in the electricity grid" - 42% of all respondents; and

Joint 4th - "Investing more in tree-trimming" - 42% of all respondents.

WNP has incorporated these priorities in to its' planning process and specific project needs. Below are direct links to illustrate how WNP's DSP addresses these customer priorities:

- **Priority #1) Maintain and Upgrade Equipment:**
  - ✓ WNP's current fixed asset preventative maintenance program is in line with best utility practice as validated by Kinectrics' Asset Condition Assessment.

- **Priority #2) Reduce Time Needed to Restore Power:**
  - ✓ In 2014 and 2018, WNP replaced 2 substations and incorporated new technology including SCADA and installing automated reclosers on the feeders to reduce outage times and improve safety. WNP's future preventative maintenance plans include proactively inspecting these reclosers and other integral station components to ensure their performance.
- **Priority #3) Having an on-line Outage Map:**
  - ✓ The utility will start exploring what "outage map" solutions exist and whether there are other alternatives (e.g. SMS text messaging to customers of outages and restoration times). WNP has not included this item in its capital investment program for 2021-2025 due to having no cost

estimates or scope of work available; however during this DSP period, the LDC will identify a solution and circle back with customers to determine if this is still a requirement

- **Priority #4a) Invest in the Electric Grid:**
  - ✓ As demonstrated within WNP's DSP, capital investment plans are established with a balance between prudent spending and appropriate levels of replacement.

- **Priority #4b) Invest in Tree Trimming:**
  - ✓ WNP has an aggressive 3-year tree trimming schedule and is a direct reflection of the LDC's low outage and duration of outage statistics. WNP will continue with this tree-trimming schedule.

- **Priority #6) Burying Overhead Wires:**
  - ✓ WNP works closely with the Municipality, as well as contractors and developers. When rebuilding infrastructure, placing assets underground is always a consideration and WNP strives to install plant underground when feasible, cost effective and if there is collaborative scheduling.

5.4b Expectation of System Development

As discussed in sub-section "5.3.2d Capacity of Existing System Assets" over the next five years, 2021 to 2025, no capacity constraints are anticipated on the distribution system requiring investments into capacity upgrades. And, as an embedded distributor, the LDC is not aware of any upstream capacity constraints at the Hydro One Transmission stations relating to the WNP supply feeders.

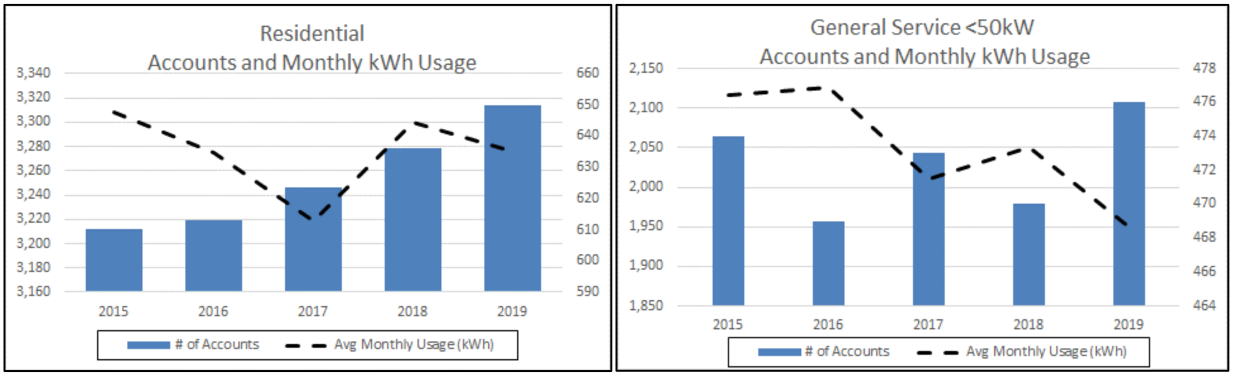
As discussed in sub-section "5.2.2a Municipal Government - Description of Consultation", the meetings with and reports from municipal government provide a good source of information for consideration in WNP's DSP 5-year capital plan. There is anticipated population growth in WNP's service area and, over the capital investment period 2021-2025, the utility does not anticipate system capacity constraints or replacement of major assets (such as substations) to meet demand during this planning cycle.

Forecasted Load and Customer Growth:

In WNP's service territory, over the past 5 years of 2015 to 2019, annual customer growth (number of accounts) has averaged below 1% per year. Although there has been some growth, energy usage has actually declined over the same 5-year period.

The charts below illustrate the average monthly kWh metered usage for WNP's Residential and General Service <50kW rate class customers for the five-year period of 2015 to 2019:

Figure 101: Average Monthly kWh Metered Usage (kWh).



Residential - Trend	2015	2016	2017	2018	2019
# of Accounts	3,212	3,219	3,246	3,279	3,314
Avg Monthly Usage (kWh)	648	635	613	644	635

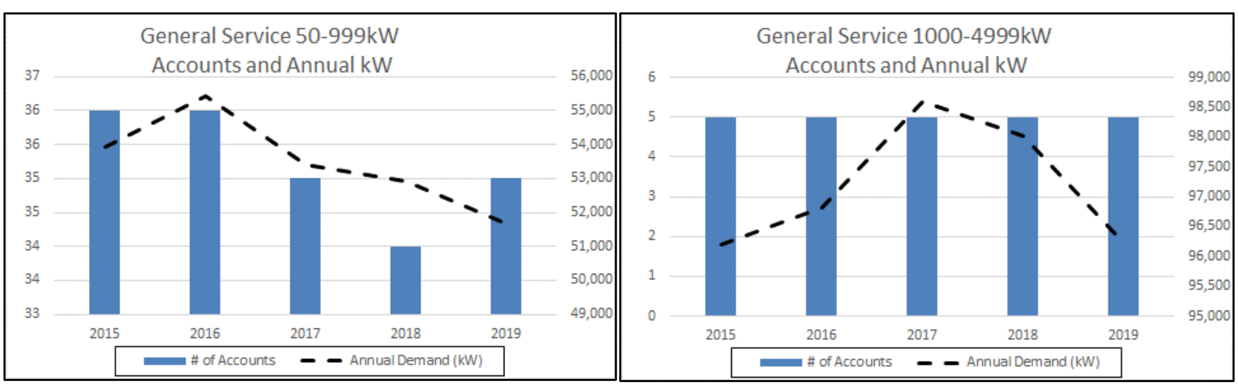
GS <50 kW - Trend	2015	2016	2017	2018	2019
# of Accounts	474	469	473	470	476
Avg Monthly Usage (kWh)	2,116	2,126	2,010	2,050	1,950

The above charts show that although there has been an increase in the number of accounts in these rate classes, the average monthly kWh usage per customer has continued to decline for the years 2016, 2017 and 2019. For the year 2018, the average monthly kWh usage was above prior years due to an above average warmer summer than normal, resulting in an increase in the use of air-conditioning.

More efficient appliances and electronic devices, better insulated buildings, uptake of and implementation of CDM programs as well as consumer behaviour to reduce energy costs have all contributed to monthly average kWh usage declining.

The charts below illustrate the average annual kW demand WNP's General Service 50-999kW and General Service 1,000-4,999kW rate class customers for the five-year period of 2015 to 2019:

Figure 102: Average Annual kW Demand.



GS 50-999 kW - Trend	2015	2016	2017	2018	2019
# of Accounts	36	36	35	34	35
Annual Demand (kW)	53,924	55,436	53,405	52,915	51,685

GS 1000-4999 kW - Trend	2015	2016	2017	2018	2019
# of Accounts	5	5	5	5	5
Annual Demand (kW)	96,203	96,818	98,592	98,025	96,230

The above charts show that although there has been a static number of accounts in these rate classes, the average annual kW demand per customer has generally declined over the 5-year period.

Taking into consideration the above information concerning WNP's customer usage and number of accounts, the LDC forecasts electricity usage (kWh) and demand (kW) to remain static (i.e. not increasing) over the forecasted planning period of 2021-2025. Therefore, in WNP's opinion, the current capacity of the distributor's system of is adequate to sustain the forecasted customer growth for the planning period 2021 to 2025 with no distribution system development required.

5.4.1 Capital Expenditure Planning Process Overview

In managing its' distribution system assets, WNP's core objective is to optimize performance of the assets at a reasonable cost with due regard for system reliability, safety, and customer service expectations. WNP is committed to providing our customers with an economical, safe, reliable supply of electricity and enabling our community to be energy efficient.

WNP's guiding principles regarding Capital Expenditure are two-fold:

1) To replace assets before they fail; and
2) To replace assets at the end of their useful life

It is generally accepted in the energy industry, and in WNP's opinion that, rather than age, the asset "stress" is a more determining factor of an asset's life and a sound indicator for the required maintenance or replacement of the asset. On this basis, in the LDC's opinion assets under greater stress should be monitored more closely and maintained more than those under less stress. This ensures a wise use of limited capital and maintenance budgets.

5.4.1a Description of Tools and Methods Used for Risk Management

WNP maintains a "Risk Analysis and Mitigation Plan" plan (known as a "Risk Register") that is used as a guide to assist the utility in identifying and managing risks. Some risks are controllable; some risks are out of the LDC's control or ability. The plan is reviewed monthly by management and Directors to ensure it remains updated in an evolving electricity landscape and that the identified strategic directions are followed.

The objectives of the "Risk Register" document are:

i. To identify risks known to Wellington North Power;
ii. To rate identified risks by probability of occurrence and by impact;
iii. Where necessary, qualify and quantify identified risks;
iv. Propose mitigation plans that manage the risk, where possible (i.e. monitoring);
v. Include risk mitigation in budget and resource planning;
vi. Update the "risk register" periodically to reflect internal and external changes;
vii. To alert the Board Directors of the potential occurrence of major risks as well as risks that deem to be unacceptable.

Below is an excerpt of WNP's "Risk Register" for the risks relevant to WNP's Asset Management objectives:

Figure 103: WNP's Risk Register

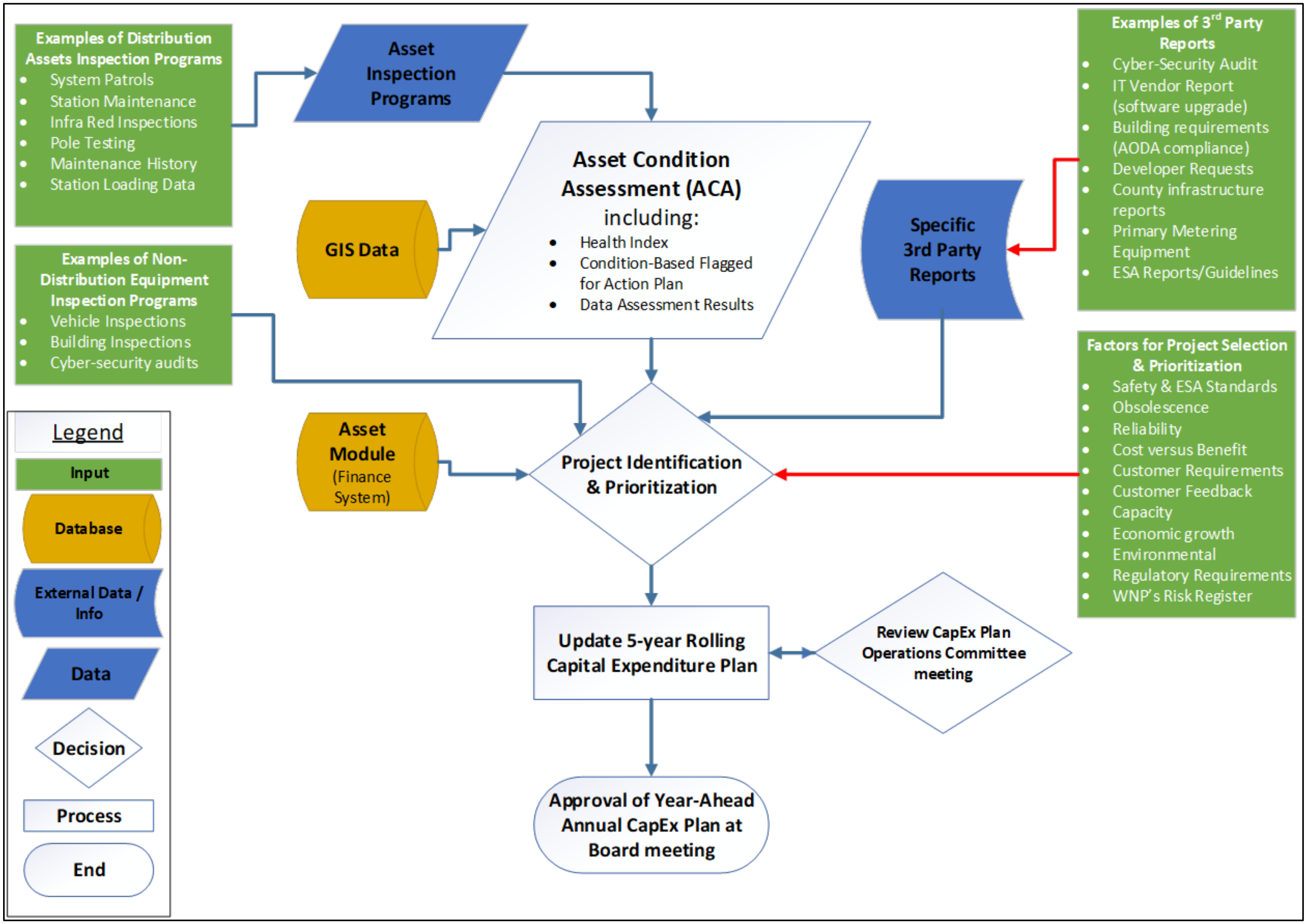
Risk #	Risk Type	Risk	WNP's Asset Management Objectives
1	External	Mandates from OEB	o Consideration of acts, regulations, guidelines and good utility practice. o Consideration of the total cost of the asset to minimize the long-term costs borne by the ratepayers.
2	External	Legislation from Ministry of Energy Ministry of Labour	o Maximizing public and employee safety. o Minimize environment risks and hazards.
4	External	Large customer transfers to Combined Heat Power (CHP) or co-generation source	o Meeting customers' needs and expectations today and for the future. o Reliability of the distribution system.
5	External	Large development (in Mount Forest) not materializing before 2025	o Reliability of the distribution system. o Meeting customers' needs and expectations today and for the future.
6	External	Disruptive/ emerging technology with mass-market uptake	o Reliability of the distribution system. o Facilitating Smart Grid development. o Facilitating new renewable connections. o Aligning the DSP with Regional Planning objectives and provincial Long-term Energy Plans.
8	External	Cyber-security threat	o Consideration of acts, regulations, guidelines and good utility practice. o Consideration of the total cost of the asset to minimize the long-term costs borne by the ratepayers.
14	External	Readiness for growth and development in Wellington North	o Reliability of the distribution system. o Meeting customers' needs and expectations today and for the future.

In preparing capital plans, WNP's management reviews its' Risk Register to identify if there is a need for capital investment to minimize risks (e.g. cyber-security: increased threat-activity therefore need to invest in hardening IT/OT controls and prevention solutions.)

5.4.1b Processes, Tools & Methods Used to Identify, Select, Prioritize and Pace the Execution of Projects/Programs

The method used to identify and select capital projects is integrally linked to WNP's Asset Management Process as described in "Section 5.3.1 Asset Management Process" The flowchart below illustrates how WNP's Capital Expenditure Plan is maintained based on updated inputs, data, reports and information:

Figure 104: Inputs to WNP's CapEx Plan



The projects included in the capital expenditure plan can be grouped into one of the four investment categories listed below, based on the ‘trigger’ driver of the expenditure:

a) System Access;
b) System Renewal;
c) System Service; and
d) General Plant.

a) System Access

For proposed investments under the System Access category, the key drivers in the case of WNP include:

- Customer service requests for new customer connections
- Customer requests for modifications or amendments from the LDC’s distribution equipment up to the entry point of the property.
- Customer requests for load expansion at existing commercial and industrial customers.
- Third party infrastructure developments requiring system plant relocates; and
- Mandated service obligations, such as revenue metering.

As discussed earlier, over the past 5 years, WNP has experienced a stable customer-base with the number of metered customer accounts increasing at less than an average of 1% per year. A modest number of requests are received each year for newly constructed homes. As demonstrated by the LDC’s service quality statistics, WNP’s performance in connecting new services is above the minimum target set by the regulator.

Road widening projects in the LDC’s service area require relocation of some power distribution lines each year. Such projects requiring capital investments by WNP are anticipated to continue throughout the next five years.

All residential and general service customers have been equipped with smart meters. WNP completed sampling for meter resealing and re-verification in 2017, 2018 and 2019. The LDC is planning to replace smart meters commencing in 2026 when meters will have reached their 15 year useful asset life.

b) System Renewal

WNP retained the services of Kinectrics Inc., an independent power sector consulting firm, to perform an Asset Condition Assessment (ACA) of the fixed assets employed on WNP’s distribution system. The report prepared by Kinectrics Inc. is attached in Appendix B

The ACA report evaluates the risk of assets’ failure in service by taking into account all available information, including age, operating conditions, results of visual inspections and non-destructive testing and identifies the assets in “very poor condition” and “poor condition” that present unacceptably high risk of failure in service.

Over the past five years, WNP has been systematically planning and implementing investments into asset renewal projects to replace the assets that have reached the end of their useful service life, by prioritizing investments into those assets with the highest impact on reliability and safety when they fail in service. Since the in-service failure of substation assets has the highest impact on reliability and safety, a majority of the asset renewal investments during the past five years have focussed on the replacement of substations.

Distribution system renewal projects during the next five years also include renewal of high risk assets on both the overhead and underground distribution system. By taking into account the results of testing, patrols and service age, assets which are in poor condition are identified and included in this distribution plan for renewal.

WNP has not had extensive failure issues with the overhead pole mounted distribution transformers. Like most distribution utilities, WNP manages this asset category using a reactive replacement strategy, i.e. replacement of transformers upon failure, unless inspections identify transformers that present safety risks. In the case of our pad mounted transformer, WNP plans to replace any that are considered a live front transformer which is considered a risk to worker safety. This is a relatively small population typically found in neighbourhoods built in the 1960s.

c) System Service

Projects in the System Service category are driven by the need to alleviate capacity constraints due to load growth. The projects in this category also include capital investments aimed at improving system operations, reliability and efficiencies through voltage upgrades, distribution automation and intelligent devices or equipment, all aimed at enhancing customer value and operational effectiveness.

During the next five years, no capacity constraints are anticipated on the distribution system requiring investments into capacity upgrades. WNP’s smart grid development initiative, involving equipping all the distribution stations with automated feeder reclosers and supervisory control and data acquisition (SCADA) system, has been started. Two of the stations are now equipped with automated and remote controlled reclosers, protected through SEL relays, allowing all features of the SCADA system to be fully utilized. Smart grid development initiative also includes upgrade and renewal of revenue meters to comply with the regulations.

d) General Plant

The capital investments under this category include investments into motor vehicle fleet, equipment and tools, buildings and facilities, computer hardware, software systems and system supervisory equipment. These investments are driven by the objectives to improve employee safety as well as maintain worker productivity and operating efficiency.

WNP maintains a list of potential future CapEx projects and programs that takes in qualitative information from both the Asset Condition Assessment study and the 3rd party inputs. The utility assess these proposed projects taking into consideration factors including:

- Safety, ESA Standards – does the LDC need to make changes to its distribution system to comply with latest ESA standards. For example replacing “Delta” connections with “Wye” grounded connections.
- Reliability – are there assets that are failing that should be replaced to maintain reliability (e.g. a leaking transformer).
- Cost versus Benefit - the cost-effectiveness of on-going expenses to maintain / repair an existing asset (O&M expense) rather than replace with a new asset (CapEx). This data is provided from the utility’s financial system.
- Programs to replace certain end-of-life assets in advance of failure are also given high priority to allow for a paced and sustainable replacement program that “levels” annual spending by asset type to the extent possible. For instance, annual replacement of poles and transformers that have been identified as in the ACA study as having a poor health index score.
- Customer Requirements and Requests – Priority in project selection is given to non-discretionary projects that are required to meet regulatory obligations, for example, service connections and plant relocations.
- Customer Feedback – from surveys and customer meetings, for instance the installation of a 2nd 44kV feeder to the Town of Mount Forest in 2016 to provide for additional capacity and further switching opportunities in the event of a loss of supply.
- Economic growth – does the project support growth in our community, for instance working with builders and developers to “right-size” connection requirements for housing projects.
- Regulatory Requirements – for example the installation of MIST meters to comply with the Distribution System Code Section 5.1.3 and OEB’s requirement EB-2013-011.
- Cyber-security / Privacy of Data – programs that increase the protection of WNP’s IT and OT operating systems and platforms as well as initiatives that enhance the protection of data and information.

- **Updating Rolling 5-year Capital Expenditure Plan:**

From the list of potential future projects, WNP updates its rolling 5-year capital plan. This contains projects that have been prioritized by year that can now be scoped to provide an estimate for the work. Examples include:

- Pole replacement jobs can be entered into WNP's job estimation tool to provide budget amount needed to undertake the project.
- Requests for quotes can be sent to IT providers, the MSP for wholesale metering projects and manufacturers for bucket-truck replacement.

WNP's capital budget broadly consists of the following categories:

- **Annual activities:** Replacement of assets identified as in poor condition as a result of inspections.
- **New services:** This item is non-discretionary and unpredictable, WNP typically use the last 3 years of actual CapEx spent on new services/upgrades to form a view for the next 5 years. The table below shows WNP's CapEx spent for the past 3 years:

Figure 105: New Service / Upgrades CapEx History

	2017	**2018**	**2019**	**3-yr Average**
New Service & Upgrade	$44,017	$99,257	50,913	$64,729

  In WNP's CapEx plan for years 2021-2025, WNP have used an annual budget amount of $60,000 for this item.

- **Metering**: Replacement of failed or broken Smart meters is treated as a non-discretionary item. The removed meters are scrapped because the one-year warranty period has passed and it is more cost-effective to purchase a new meter (at approximately $115 per meter) compared to sending the meter back to the manufacturer for investigation (approximate cost $200).
- **Metering Reseal or Replacement:** In 2017, WNP started the reverification of its Smart meters. This involves sending a sample of meters, based on the year of manufacturer, for verification according to Measurement Canada standards. The sampling was approved and meter populations were resealed for six years.
- **Pole line rebuild**: Specific projects to replace a number of poles due to health index.
- **Smart Technology:** Typically includes projects to automate the distribution system or provide additional data or control to SCADA.
- **Underground projects:** Specific projects to rebuild underground assets which are in poor health.
- **IT/Cyber-security:** Specific projects to replace equipment or harden IT security and enhance data privacy.
- **Wholesale Metering Program:** Recommendations from WNP's Meter Service Provider (MSP) to replace Primary Metering Equipment (PME i.e. revenue meters) to maintain accurate reporting of

metered demand and usage to the IESO; this includes meters, metering equipment, modems, and cabinets.

- **Shop tools:** Replacement of tools and safety equipment to support day-to-day operations activities.
- **Transport:** Replacement of fleet vehicles based on usage, age and on-going maintenance costs.
- **Building renovation:** Repairs to buildings and replacement of office furniture. WNP treats this category as discretionary.

- **Review – Operations Committee Meeting**

  WNP's Operations Committee meeting meets every quarter. The Committee consists of Directors and Staff. One of the meeting's mandates is to review next year's capital spending, reviewing each project and its' proposed cost. The objective is for the Committee to make a recommendation for the WNP Board of Directors to approve the Capital Expenditure (CapEx) budget.

- **Approval of CapEx Budget**

  With a recommendation from the Operations Committee, the Board of Directors review the CapEx budget for the year ahead. This is typically at October's Board meeting with the CEO/President discussing each project, its scope and why it is needed and why it is a priority. It is envisaged that the Board approve the annual capital plan at November's Board meeting.

5.4.1c Method and Criteria Used to Prioritize REG Investments

Whilst WNP does not expect significant, if any, customer interest in connecting Renewable Energy Generation (REG), investment prioritization for enabling connection of REG shall follow the same method and criteria specified above. WNP has not experienced any major issues with connection of existing microFIT or small FIT projects to its system and does not foresee any issues within the current 5-year plan.

5.4.1d Approach to Assessing Non-Distribution System Alternatives to Relieve System Capacity or Operational Constraints

WNP has not identified any capacity-driven projects in the current DSP. However, when considering project alternatives to address operational constraints such as system capacity and performance during contingencies WNP will consider non-distribution system alternatives ("non-wires solutions") such as Distributed Energy Resources (DER) or Demand Response when developing possible solutions to relieve these types of issues.

5.4.1e Strategy to Implement Cost-Effective Modernization of the Distribution System

WNP's system modernization strategy is focused on the continued investment of the following technology-driven Smart Grid projects and programs:

i. Continue enhancement of the SCADA system.
ii. Proactively replace legacy fuse protection within Substations with modern relay-controlled reclosers to improve safety, reliability, equipment protection, outage visibility, SCADA controllability of its feeders and allow for increased flexibility in DER penetration.
iii. Consider traditional vs "non-wires" solutions when reviewing proposed contingency and other investments.

WNP's smart grid development initiative, involving equipping all the distribution stations with automated feeder reclosers and supervisory control and data acquisition (SCADA) system, has been started. Two of the stations are now equipped with automated and remote controlled reclosers, protected through SEL relays, allowing all features of the SCADA system to be fully utilized. Smart grid development initiative also includes upgrade and renewal of revenue meters to comply with the regulations.

Currently, WNP provides customer access to consumption data in an electronic format through a solution called CustomerConnect provided by the company's Customer Information Service s (CIS) provider. This solution enables customers to register on-line to view their consumption data as well as payment history. WNP's existing CIS vendor contract is due for renewal in 2022. The LDC has started preliminary research to identify potential CIS vendors and, in 2021, the LDC will undertake a more thorough study of possible CIS alternatives together with web-presentment and/or mobile applications solutions that can provide consumption data to our customers.

5.4.1f Consideration to Defer Infrastructure Projects Relating to Rate-Funded Conservation & Demand Management Programs

WNP is not proposing any rate-funded Conservation and Demand Management (CDM), demand response, efficiency or storage activities within the current forecast period of 2021 to 2025 for the purpose of deferring investments in distribution infrastructure. However, WNP will consider such solutions on a case-by-case basis where implementing one or more of these activities may result in deferring planned capital investments or may address operational or reliability issues.

5.4.1.1 Rate-Funded Activities to Defer Distribution Infrastructure

As noted in sub-section 5.4.1f (above), WNP is not proposing any rate-funded Conservation and Demand Management (CDM), demand response, efficiency or storage activities within the current forecast period of 2021 to 2025 for the purpose of deferring investments in distribution infrastructure.

5.4.1.1a CDM Programs Target System Peak Demand (kW) Reductions

Not applicable.

5.4.1.1b Demand Response Programs

Not applicable.

5.4.1.1c Improve Distribution System Efficiency and Reduce Distribution Losses Programs

Not applicable.

5.4.1.1d Energy Storage Programs

Not applicable.

5.4.2 Capital Expenditure Summary

The table below illustrates WNP's actual capital expenditure grouped by projects for the years 2016 to 2020 and planned for 2021 Test Year.

Figure 106: Appendix 2-AA: Table 2 Capital Projects Table[23]

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
Project Name #1 - Special Projects						
2nd line 44 kV feeder	1,308,427					
MS3 substation		9,452	1,683,441			
Sub-Total	1,308,427	9,452	1,683,441	0	0	0
Project Name #2 - Annual Projects						
Pole & Transformer Replacements	63,564	70,668	69,163	49,230	32,458	55,000
New Services	33,081	44,017	99,257	50,913	21,643	60,000
Meter Replacements	22,201	57,396				25,000
Smart Meter Re-seal and Reverification			119,042	154,346		10,000
PME Metering Equipment	6,903		5,634			1,500
Sub-Total	125,749	172,081	293,096	254,489	54,101	151,500
Project Name #3 - Pole Line Construction Projects						
Pole Line Rebuild - Queen Street West (phase 1)		101,715				
Pole Line Rebuild - Holstein main road		155,044				
Pole Line Rebuild - Isabella St between Eliza St & Charles St			41,247			
Pole Line Rebuild - Adelaide St between Clarke St and Conestoga St			44,466			
Pole Line Rebuild - William St				76,180		
Pole Line Rebuild - Preston St N btw Smith and Domville Sts				82,890		
Pole Line Rebuild - York St at Queen W				23,146		
Pole replacement - Parkside Drive				12,054		
Pole Line Rebuild - Durham St				8,799		
Pole relocation - Holstein Bridge				9,774		
New pole line - Eliza St					29,888	
Pole Line Rebuild - Tucker St					3,855	
Pole Line Rebuild - Queen Street West (phase 2)					307	
Pole Line Rebuild projects (2021)						185,000
Sub-Total	0	256,759	85,713	212,843	34,050	185,000
Project Name #4 - Developers / Contractors						
Lucas Subdivision		21,716	23,119			
Boomer Rock		8,266	3,206			
Cork St Townhouses			7,671			
New Padmount Transformer - 440 King St		47,885	12,399			
Perth St Extension			6,827			
Emergency - Arthur Waste Water Treatement plant (contractor hit underground cabling, replaced transformer)				15,754		
Wilson Townhouses				8,822		
Wellington St Development				1,286		
Frederick St Pumping station				1,017		
Arthur St Circuit Holding Townhouses					705	
Sub-Total	0	77,867	53,222	26,879	705	0
Project Name #5 - Adhoc						
Underground Project (2020)						75,000
SCADA - communication upgrade						15,000
SCADA - switch		1,113				
SMART Technology - Reclosures						10,000
Sub-Total	0	1,113	0	0	0	100,000
Project Name #6 - General Plant						
Computer Hardware / Software / Cyber-Security	92,481	77,621	20,160	87,146	68,892	138,000
Building Renovation & Accessibilty Compliance	7,748	29,677		1,215	6,019	50,000
Fleet Replacement		37,499		38,401	114,000	
Tools	1,704	26,511	2,144	3,795		2,500
Safety Equipment	9,405		54,500	5,180	1,377	
Sub-Total	111,338	171,308	76,804	135,737	190,288	190,500
Miscellaneous	31	24,275	37,455	45,035	2,766	
Total	**1,545,545**	**712,855**	**2,229,731**	**674,983**	**281,910**	**627,000**
Less Renewable Generation Facility Assets and Other Non-Rate-Regulated Utility Assets *(input as negative)*						
Total	**1,545,545**	**712,855**	**2,229,731**	**674,983**	**281,910**	**627,000**

** 2020 Actual is up to May 31st 2020*

[23] Source: OEB model: 2021 Filing Requirements - Chapter 2 – Appendices, worksheet App.2-AA Capital Projects

The table below compares WNP's actual capital expenditure versus planned for the historical period 2016 to 2020 by OEB investment category:

Figure 107: Appendix 2-AB: Table 2 Capital Expenditure Summary[24]

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	55	39	-29.6%	240	77	-67.8%	240	141	-41.4%	240	64	-73.5%	60	25	-59.0%	70	70	70	70	85
System Renewal	90	113	25.7%	390	454	16.5%	1,932	2,012	4.2%	290	476	64.0%	450	67	-85.1%	340	265	265	315	315
System Service	1,373	1,307	-4.8%	-	11	--	-	55	--	-	5	--	-	1	--	27	19	21	82	14
General Plant	76	86	14.1%	139	170	22.7%	24	22	-8.9%	422	131	-69.1%	453	189	-58.3%	191	598	151	151	180
TOTAL EXPENDITURE	1,594	1,546	-3.0%	769	713	-7.3%	2,196	2,230	1.5%	952	675	-29.1%	963	282	-70.7%	627	952	507	617	594
Capital Contributions		- 12	--			--			--		- 26	--		- 20	--	- 20	- 20	- 20	- 20	- 20
Net Capital Expenditures		1,534	--		713	--		2,230	--		649	--		262	--	607	932	487	597	574
System O&M	$ 651	$ 661	1.6%	$ 667	$ 667	-0.1%	$ 684	$ 638	-6.8%	$ 701	$ 621	-11.4%	$ 719	$ 313	-56.5%	$ 705	$ 719	$ 733	$ 748	$ 763

** "2020 Actual" correct as at May 31st 2020.*

The variances between "Plan" and "Actual" are included in the notes that are part of Appendix 2-AB worksheet in the Chapter 2 Appendices workbook and are also discussed below.

WNP confirms:

a) There were no expenditures for non-distribution activities in the LDC's plan or actual expenditures for 2016-2020 or for forecasted expenditures for 2021-2025.
b) All capital projects (historic and forecasted) have a project cycle life of one year or less (i.e. no projects have a project cycle life of greater than one year).

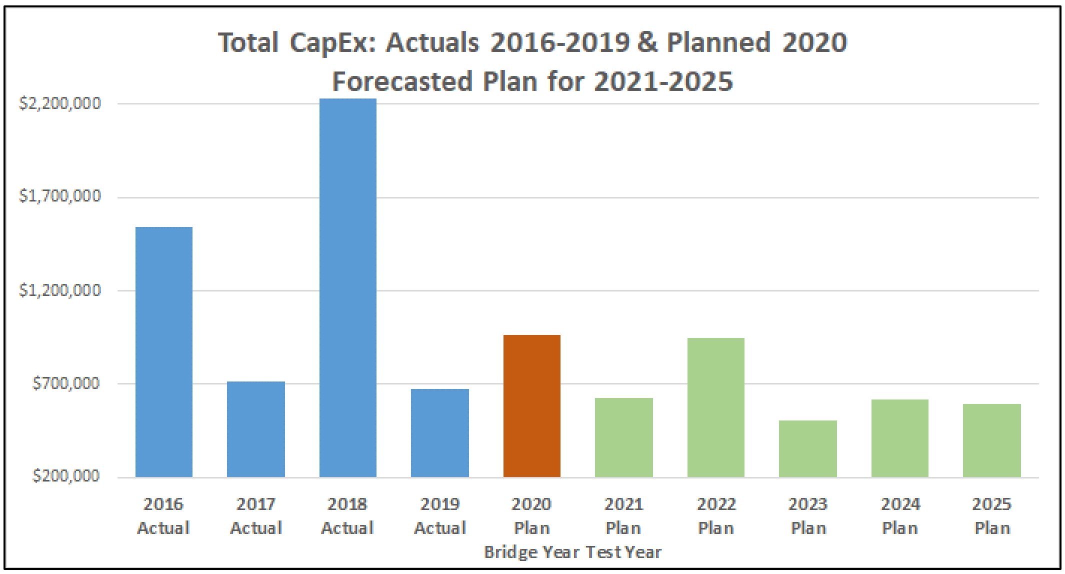
[24] Source: OEB model: 2021 Filing Requirements - Chapter 2 – Appendices, worksheet App.2-AB Capital Expenditures

The table and chart below illustrate WNP's total capital expenditure for the forward looking 5 years of 2021-2025 and is generally lower when compared to the actual capital expenditure spent for the historical period of 2016 to 2020:

Figure 108: WNP's Historic Period with Actual Costs compared to Future Years Plan

Category	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Plan *Bridge Year*	2021 Plan *Test Year*	2022 Plan	2023 Plan	2024 Plan	2025 Plan
System Access	$ 38,722	$ 77,353	$ 140,741	$ 63,630	$ 60,000	$70,000	$70,000	$70,000	$70,000	$85,000
System Renewal	$ 113,170	$ 454,353	$2,012,186	$ 480,796	$ 450,000	$340,000	$265,000	$265,000	$315,000	$315,000
System Service	$ 1,307,297	$ 10,954	$ 54,500	$ -	$ -	$26,500	$18,500	$21,000	$81,500	$14,000
General Plant	$ 86,356	$ 170,195	$ 22,304	$ 130,557	$ 453,000	$190,500	$598,050	$151,450	$150,800	$179,500
Total	**$1,545,545**	**$ 712,855**	**$2,229,731**	**$ 674,983**	**$ 963,000**	**$627,000**	**$ 951,550**	**$ 507,450**	**$617,300**	**$593,500**

Figure 109: Total CapEx for Historic Period with Actual Costs compared to Future Years Plan

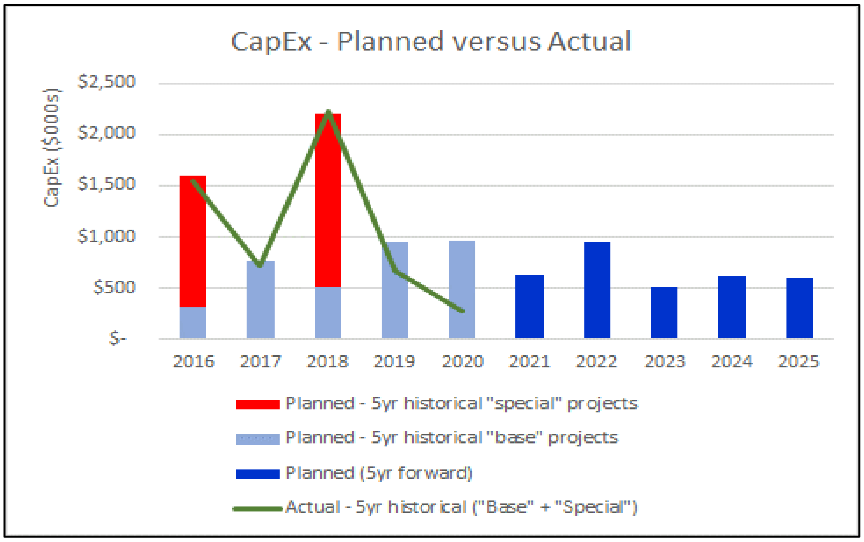


The above chart demonstrates that WNP, in preparing its' future 5-year year capital investment program for 2021 to 2025, the LDC is "levelizing" spending so that it is paced and prioritized.

In 2022, the total CapEx plan increases to account for the replacement of a 2004 model year Radial Boom Derrick "RBD" truck (General Plant), which was deferred from being replaced in 2020. For 2022, WNP has applied discretionary and non-discretionary spending (i.e. discretionary projects are those initiatives that can be deferred to another year without impacting customers, system reliability or safety). One of the discretionary items that has been deferred from 2022 to 2024 is building renovation work to replace the roof at the LDC's office in Mount Forest (General Plant) with a proposed planned budget amount of $65,000.

The chart below illustrates WNP historical spending for the 5 year period 2016 to 2020 and plots the future planned expenditure for the forward looking 5 years of 2021-2025:

Figure 110: WNP's Capital Expenditure Summary



** "2020 Actual" correct as at May 31st 2020.*

For the years 2016 and 2018, WNP completed "special" projects (i.e. projects that relate to a significant investment and occur infrequently). For these years, WNP applied discretionary and non-discretionary spending (i.e. discretionary projects are those initiatives that can be deferred to another year without impacting customers, system reliability or safety). These "special" projects were:

- 2016: Construction of a new 2nd line 44kV feeder.
- 2018: Replacement of substation (MS3).

Both "special" projects were included in WNP's 2015 DSP. These projects were in-service during the 2016 and 2018 as planned and within budget.

The table below illustrates WNP's 5-year historical period CapEx plan and Actual CapEx costs segmented by the OEB investment categories:

Figure 111: WNP's Historic Period Plan and Actual Costs

	Historical Period - Plan and Actual														
	2016			2017			2018			2019			2020		
Category	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual	Var	Plan	Actual	Var
System Access	$ 55,000	$ 38,722	-29.6%	$ 240,000	$ 77,353	-67.8%	$ 240,000	$ 140,741	-41.4%	$ 240,000	$ 63,630	-73.5%	$ 60,000	$ 24,571	-59.0%
System Renewal	$ 90,000	$ 113,170	25.7%	$ 390,000	$ 454,353	16.5%	$ 1,932,000	$ 2,012,186	4.2%	$ 290,000	$ 475,616	64.0%	$ 450,000	$ 67,051	-85.1%
System Service	$ 1,373,217	$ 1,307,297	-4.8%	$ -	$ 10,954		$ -	$ 54,500		$ -	$ 5,180		$ -	$ 1,377	
General Plant	$ 75,694	$ 86,356	14.1%	$ 138,670	$ 170,195	22.7%	$ 24,470	$ 22,304	-8.9%	$ 421,850	$ 130,557	-69.1%	$ 453,000	$ 188,911	-58.3%
Total CapEx	**$1,593,911**	**$1,545,545**	**-3.0%**	**$ 768,670**	**$ 712,855**	**-7.3%**	**$2,196,470**	**$2,229,731**	**1.5%**	**$951,850**	**$674,983**	**-29.1%**	**$963,000**	**$281,910**	**-70.7%**

** "2020 Actual" correct as at May 31st 2020.*

Historical Plan Period - Variances between Plan and Actual

Detailed below are the factors that resulted in a material variance of =/+ $50,000 per year by OEB investment category for the historical 5-year period of 2016-2020:

- **Variance Analysis: 2016 CapEx Plan Versus Actual:**

Figure 112: Variance Analysis: 2016

	2016			
Category	Plan	Actual	Var	
System Access	$ 55,000	$ 38,722	$ (16,278)	-29.6%
System Renewal	$ 90,000	$ 113,170	$ 23,170	25.7%
System Service	$ 1,373,217	$ 1,307,297	$ (65,920)	-4.8%
General Plant	$ 75,694	$ 86,356	$ 10,662	14.1%
Total CapEx	**$1,593,911**	**$1,545,545**	$ (48,367)	**-3.0%**

System Service: 2nd 44kV Feeder.

In 2016, with assistance from Hydro One Networks Inc. (HONI), WNP installed a new 44kV feeder to the Town of Mount Forest to address capacity and reliability concerns. This capital investment project was included in WNP's 2015 Distribution System Plan[25] with an estimated total project cost, as at February 2016) of $1,373,217 which included the following items:

Figure 113: 2016 2nd Line 44kV Feeder Estimates versus Actuals

Project Component	Estimated Cost	Actual Cost	Variance
Hydro One work involving construction of 11 km line expansion to the south end of Mount Forest	$881,156	$838,434	($42,722)
Hydro One's capacity study of the current feeder to Mount Forest	$32,061	$32,061	$0
New Primary Metering Equipment	$80,000	$87,639	$7,639
WNP pole-line work to connect new feeder to LDC's existing system	$380,000	$350,293	($29,707)
Total	**$1,373,217**	**$1,308,427**	**($64,790)**

The 2nd line 44kV feeder project was completed in 2016, energized in December 2016 and under budget as illustrated above. In May 2016, WNP entered into a Capital Cost Recovery Agreement (CCRA) with Hydro One based upon a 50/50 split of HONI's total cost for construction of 11 km line expansion to the south end of Mount Forest – the CCRA amount was $838,434(before HST) which was below HONI's quote of $881,156 (before HST, quote as at February 2016).

[25] Wellington North Power Inc. 2015 Distribution System Plan (filed with its Cost of Service application: EB-2015-0110) – Section 5.4.5.3 Special Capital Projects; sub-section 5.4.5.3.1 Second 44kV Feeder to Mount Forest

- **Variance Analysis: 2017 CapEx Plan Versus Actual:**

Figure 114: Variance Analysis: 2017

Category	2017 Plan	Actual	Var	
System Access	$ 240,000	$ 77,353	$ (162,647)	-67.8%
System Renewal	$ 390,000	$ 454,353	$ 64,353	16.5%
System Service	$ -	$ 10,954	$ 10,954	
General Plant	$ 138,670	$ 170,195	$ 31,525	22.7%
Total CapEx	**$ 768,670**	**$ 712,855**	$ (55,815)	**-7.3%**

System Access: Residential & Small Business meter replacement project.

In WNP's 2015 DSP, the LDC included a budget for "Residential & Small Business meter replacement project" under Service Access. The utility was planning to replace its Smart meters over a 3-year period of 2017 to 2019 with an annual budget of $180,000 as meters were approaching their 10-year meter seal life as recognized by Measurement Canada. At the time of filing its's 2015 DSP, it was unknown whether sampling would produce results that would allow for the meters to be "re-sealed" for an additional six years. Therefore WNP include the estimate for full replacement of meters.

Smart Meters have an asset life, according to Kinectrics Inc., of 15 years yet only 10 years according to Measurement Canada. By having the meters tested and resealed, WNP decided it would be in the interest of its rate-payers not to replace the meters but to have them re-verified and resealed. Also, WNP revised the OEB investment for this project from "System Access" to "System Renewal" as the assets' life, according to Measurement Canada, had been extended (renewed). The table below summarizes the variances between Plan and Actual as well as category change:

Figure 115: 2017 Meter Replacement Project Amended to Meter Reverification

Project	Category	Plan	Actual	Variance
Residential & Small Business meter replacement project	System Access	$180,000		($122,604)
Residential & Small Business meters sample tested, re-verified and resealed	System Renewal		$57,396	

System Renewal: Pole-line Rebuild – Queen Street West

In 2017, the Township planned to resurface the road and sidewalk of Queen Street West in Mount Forest. The assets located in this area were circa 1975 and approaching the end of their life. The existing Class 6 poles were replaced with Class 3 poles to meet current construction and safety standards. The porcelain insulators were replaced with safer polymer type insulators. During this period there was discussion regarding a potential new develop at the far west end of Queen St W.

It was decided that the far end rebuild would be deferred until a further investigation of the potential development was completed.

Figure 116: 2017 Pole-line Line Project Variance Analysis

Project	Category	Plan	Actual	Variance
Pole-line Rebuild – Queen Street West	System Renewal	$190,000	$101,715	($88,285)

- **Variance Analysis: 2018 CapEx Plan Versus Actual:**

Figure 117: Variance Analysis: 2018

	2018			
Category	Plan	Actual	Var	
System Access	$ 240,000	$ 140,741	$ (99,259)	-41.4%
System Renewal	$ 1,932,000	$ 2,012,186	$ 80,186	4.2%
System Service	$ -	$ 54,500	$ 54,500	
General Plant	$ 24,470	$ 22,304	$ (2,166)	-8.9%
Total CapEx	**$2,196,470**	**$2,229,731**	$ 33,261	**1.5%**

System Access: Residential & Small Business meter replacement project.

As noted in 2017, WNP elected to sample test, reverify and reseal Smart Meters rather than replace and revised the OEB investment for this project from “System Access” to “System Renewal”. The table below summarizes the variances between 2018 Plan and Actual as well as category change:

Figure 118: 2018 Meter Replacement Project Amended to Meter Reverification

Project	Category	Plan	Actual	Variance
Residential & Small Business meter replacement project	System Access	$180,000		($60,958)
Residential & Small Business meters sample tested, re-verified and resealed	System Renewal		$119,042	

System Renewal: Pole Line Rear to Front Conversion- Holstein Line Rebuild.

The Holstein Line Rebuild was a 2018 system renewal project included in WNP’s 2015 DSP. The project was intended to facilitate the backyard to conversion of several residential customers to front lot feeds with the pole line supplying electricity to the rear fed lots and travels through a field with no roadway. The project was estimated to cost $70,000; however the project did not proceed because:

i. During 2018, WNP replaced an aged substation (MS4) with a new substation. The Operations team were more involved in the project than initially planned, for instance helping with the tear-down of the old substation.

ii. Looking through outage records, there have been three power outages in this area over the period 2012 to 2017.

iii. There have been no complaints or requests to move the service from the several residential customers that live in this area.

iv. The rear lot pole line remains accessible although not ideal the project was deemed cost prohibitive.

Due to the above factors, the project did not happen; and at the time of preparing WNP's capital plan for 2021-2025, this project has not been included. Because this project did not start, this contributed to the 2017 variance:

Figure 119: 2018 Pole-line Line Project Variance Analysis

Project	Category	Plan	Actual	Variance
Pole-line Rebuild – Holstein Rear-Lot Conversion	System Renewal	$70,000	$0	($70,000)

System Service:

In 2018, WNP invested in safety protection and control equipment that was unplanned, i.e. not included in the LDC's 2015 DSP. Consequently, this caused an overage in spending in category System Service of:

Figure 120: 2018 Safety Protection and Control Equipment

Project	Category	Plan	Actual	Variance
Replacement of 4kV Gang Operated Switches replacing Single Solid Blade Switches.	System Service	$0	$42,347	$42,347
Delta Meter Upgrades. The Electrical Safety Authority (ESA) issued a bulletin for "Delta" services with "Wye" transformers and no neutral connections. WNP identified 10 locations in our service area upgrades were needed to connect the neutral or install a neutral conductor. Nine of the ten were completed in 2018 (the tenth location was completed in 2019).	System Service	$0	$6,654	$6,654
Replacement of 44kV Solid Blade Isolation Switch on load side of PME.	System Service	$0	$5,500	$5,500
	Total	**$0**	**$54,500**	**$54,500**

- **Variance Analysis: 2019 CapEx Plan Versus Actual – System Access:**

Figure 121: Variance Analysis: 2019

Category	2019 Plan	2019 Actual	2019 Var	
System Access	$ 240,000	$ 63,630	$ (176,370)	-73.5%
System Renewal	$ 290,000	$ 480,796	$ 190,796	65.8%
System Service	$ -	$ -		
General Plant	$ 421,850	$ 130,557	$ (291,293)	-69.1%
Total CapEx	**$ 951,850**	**$ 674,983**	$ (276,867)	**-29.1%**

System Access: Residential & Small Business meter replacement project.

As noted in 2017, WNP elected to sample test, reverify and reseal Smart Meters rather than replace and revised the OEB investment for this project from "System Access" to "System Renewal". The table below summarizes the variances between 2019 Plan and Actual as well as category change:

Figure 122: 2019 Meter Replacement Project Amended to Meter Reverification

Project	Category	Plan	Actual	Variance
Residential & Small Business meter replacement project	System Access	$180,000		($25,654)
Residential & Small Business meters sample tested, re-verified and resealed	System Renewal		$154,346	

In 2019, WNP were required to sample test more meters than in prior years because during the implementation of Smart meters, the majority of meters were delivered in 2010. These meters needed to be tested prior to their 10-year expiry meter seal date.

If the 2015 DSP-approved planned 2019 budget of $180,000 for the meter replacement project was transferred from "System Access" to "System Renewal", when compared to Actual spend, WNP's variance in these categories would be significantly below the materiality threshold of $50,000 as illustrated below:

Figure 123: 2019 Meter Replacement Project Amended to Meter Reverification

Category	2019 Plan	Adjustment for Meter Reverification (not Replacement)	Revised Plan	Actual	Var	
	[A]	[B]	[C] = [A] + [B]	[D]	[E] =[D] - [C]	
System Access	$240,000	-$180,000	$60,000	$63,630	$3,630	6.0%
System Renewal	$290,000	$180,000	$470,000	$480,796	$10,796	2.3%
System Service	$0			$0		
General Plant	$421,850			$130,557	-$291,293	-69.1%
Total CapEx	**$951,850**			**$674,983**	-$276,867	**-29.1%**

General Plant:

In WNP's 2015 DSP, the LDC planned to replace a bucket truck in 2019 with a budget amount of $250,000. During the quotation process it was deemed that delivery would not be until 2020 with a cost closer to $325,000. WNP also had a planned replacement of the Radial Boom Derrick "RBD" in 2020 with a budget of $345,000. WNP decided it would obtain new quotes for the RBD and defer its replacement since the vehicle remains in acceptable condition.

The purchase of the bucket truck is to be completed in 2020 and therefore WNP underspent by $250,000 in the "General Plant" investment category:

Figure 124: 2019 Fleet vehicle Replacement - Deferred

Project	Category	Plan	Actual	Variance
Replacement of 2007 Bucket Truck – deferred to 2020	General Plant	$250,000	$0	($250,000)

WNP has included the replacement of the 2004 RBD truck in the capital expenditure program for the 5 year period 2021 to 2025.

o **Variance Analysis 2020 CapEx Plan Versus Actual**

Figure 125: Variance Analysis: 2020

	2020		
Category	Plan	Actual	Var
System Access	$ 60,000	$ 24,571	-59.0%
System Renewal	$ 450,000	$ 67,051	-85.1%
System Service	$ -	$ 1,377	
General Plant	$ 453,000	$ 188,911	-58.3%
Total CapEx	**$ 963,000**	**$ 281,910**	**-70.7%**

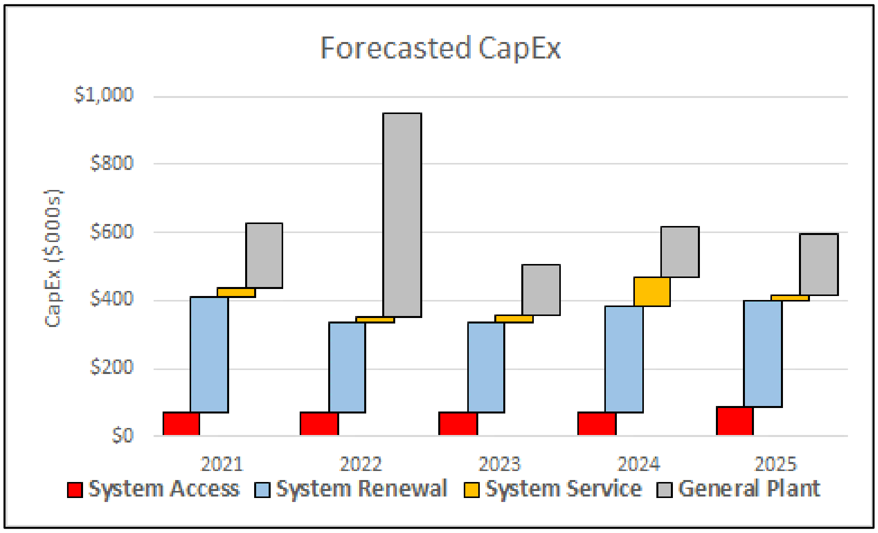
** "2020 Actual" correct as at May 31st 2020.*

The above chart shows WNP's 2020 capital expenditure as at May 31st 2020. As a result of COVID-19 pandemic, like many utilities in Ontario, WNP has been delayed in starting its' construction capital projects for the year. The utility has adhered to public health guidelines and put in place safety measures to commence work on construction projects. Typically, engineered drawings and plans are completed by the end of March, enabling the Operations team to start construction in April; however due to COVID-19, the Operations team started construction work in mid-May 2020.

Capital Expenditures for the DSP forecast period

The chart and table below illustrates the planned Capital Expenditures for the DSP forecast period of 2021 to 2025 segmented by the OEB investment categories:

Figure 126: WNP's Forecasted CapEx



Category	2021	2022	2023	2024	2025
System Access	$70,000	$70,000	$70,000	$70,000	$85,000
System Renewal	$340,000	$265,000	$265,000	$315,000	$315,000
System Service	$26,500	$18,500	$21,000	$81,500	$14,000
General Plant	$190,500	$598,050	$151,450	$150,800	$179,500
Total CapEx	**$ 627,000**	**$ 951,550**	**$ 507,450**	**$ 617,300**	**$ 593,500**

Assumptions relating to WNP's 5-year forecasted CapEx plan:

- WNP estimated forecasted CapEx amounts are based on the latest and current information and data available at this time.
- The LDC has assumed that capital jobs are started and completed within the year, meaning that the in-service date is the date shown in the table above. (At this point in the planning process, WNP assumes that there are no projects that will carry-over into subsequent years.)
- WNP expects its' load and its' customer base to increase steadily by less than 1% per year over the next five years.
- The LDC does not anticipate any material requirements to make expenditures for REG or Smart Grid projects at this time.
- 2022 General Plant includes the replacement of an RBD truck with a proposed budget of $425,000.
- WNP confirms that there are no expenditures for non-distribution activities in the applicant's budget.

5.4.3 Justifying Capital Expenditures

This section provides the necessary data, information, and analyses to support the Capital Expenditure levels proposed by WNP in this DSP. In managing its' distribution system assets, WNP core objective is to optimize performance of the assets at a reasonable cost with due regard for system reliability, safety, and customer service expectations. WNP is committed to providing our customers with an economical, safe, reliable supply of electricity and enabling our community to be energy efficient. These objectives have been met through the application of thorough and sound planning, prudent and justified budgeting while implementing the documented capital, and operating plans. WNP's system capacity or capability has not experienced any issues with connection of new services or microFIT or a small FIT project to its system and does not expect any issues within the current 5-year plan.

5.4.3.1 Overall Plan

The table below illustrates WNP's historical capital expenditure plan for 2016-2020, as approved in the LDC's 2016 Cost of Service application, and forecasted capital expenditure plan for 2021 to 2025 by investment category:

Figure 127: Capital Expenditure Plan – Historic and Proposed

Previous Capital Expenditure Plan - 2016-2020												
Category	**2016**	*% of Total*	**2017**	*% of Total*	**2018**	*% of Total*	**2019**	*% of Total*	**2020**	*% of Total*	**Total**	**Yearly Avg**
System Access	$55,000	*3%*	$240,000	*31%*	$240,000	*11%*	$240,000	*25%*	$60,000	*6%*	$835,001	$167,000
System Renewal	$90,000	*6%*	$390,000	*51%*	$1,932,000	*88%*	$290,000	*30%*	$450,000	*47%*	$3,152,002	$630,400
System Service	$1,373,217	*86%*	$0	*0%*	$0	*0%*	$0	*0%*	$0	*0%*	$1,373,218	$274,644
General Plant	$75,694	*5%*	$138,670	*18%*	$24,470	*1%*	$421,850	*44%*	$453,000	*47%*	$1,113,685	$222,737
Total	**$1,593,911**	*100%*	**$768,670**	*100%*	**$2,196,470**	*100%*	**$951,850**	*100%*	**$963,000**	*100%*	**$6,473,906**	$1,294,781

Capital Expenditure Plan - 2021-2025												
Category	**2021**	*% of Total*	**2022**	*% of Total*	**2023**	*% of Total*	**2024**	*% of Total*	**2025**	*% of Total*	**Total**	**Yearly Avg**
System Access	$70,000	*11%*	$70,000	*7%*	$70,000	*14%*	$70,000	*11%*	$85,000	*14%*	$365,001	$73,000
System Renewal	$340,000	*54%*	$265,000	*28%*	$265,000	*52%*	$315,000	*51%*	$315,000	*53%*	$1,500,002	$300,000
System Service	$26,500	*4%*	$18,500	*2%*	$21,000	*4%*	$81,500	*13%*	$14,000	*2%*	$161,500	$32,300
General Plant	$190,500	*30%*	$598,050	*63%*	$151,450	*30%*	$150,800	*24%*	$179,500	*30%*	$1,270,302	$254,060
Total	**$627,000**	*100%*	**$951,550**	*100%*	**$507,450**	*100%*	**$617,300**	*100%*	**$593,500**	*100%*	**$3,296,805**	**$659,361**

The table below illustrates WNP's historical planned Operations & Maintenance (O&M) expenses for 2016-2020, as approved in the LDC's 2016 Cost of Service application, and the proposed O&M budget for 2021 to 2025:

Figure 128: O&M Budget – Historic and Proposed

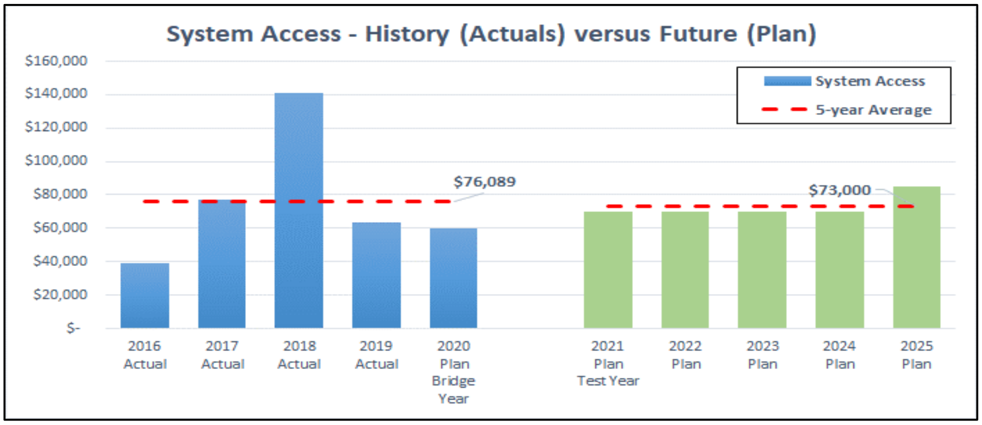
	2016	**2017**	**2018**	**2019**	**2020**
System O&M *($000s)*	$651	$667	$684	$701	$719
	2021	**2022**	**2023**	**2024**	**2025**
System O&M *($000s)*	$705	$719	$733	$748	$763

Comparative Expenditures by OEB Investment Category over the Historical Period

- **System Access**

The chart below illustrates how much WNP spent (Actuals) on System Access over the historic period of 2016-2020 compared to the LDC's forecasted CapEx plan for this investment category:

Figure 129: System Access – Historic Actuals versus Planned CapEx



The 5-year plan for System Access expenditures is consistent with historical spending and activities in this category; the 5-year historic average is $76,089 with the projected 5-year planned yearly average at $73,000.

In 2018, new service connections were unusually high compared to prior years which explains the spike in System Access costs for this year. The table below illustrates the number of new connections connected over the past 5 years:

Figure 130: Number of New Services Connected

	2015	2016	2017	2018	2019	5-year Average
New Services Connected	19	22	35	49	42	33

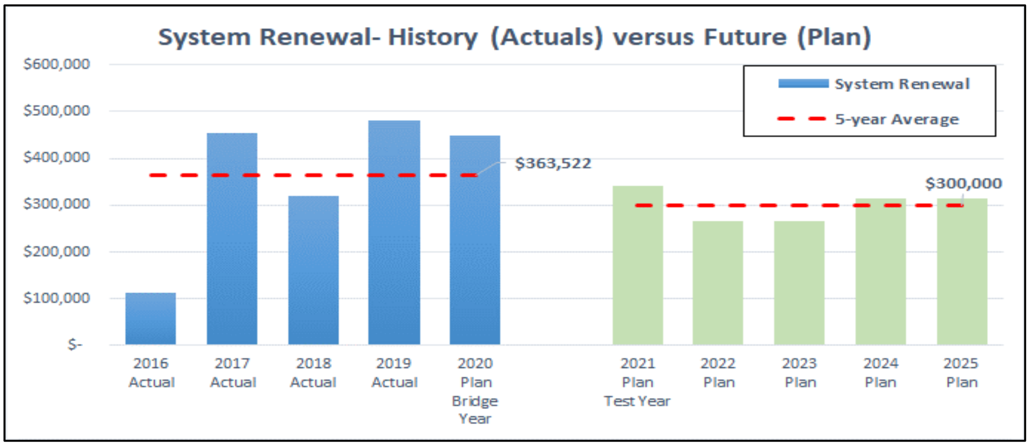
As well as new services and upgrades, included in this investment category is "meter seal or replace". WNP will continue during 2021 to 2025 with reverification and resealing of Smart meters before expiry of their 10-year meter seal date. In 2025, the LDC has planned for an additional $15,000 as it is begins meter replacements.

Overall, forecasted costs for this investment category are based on historical averages with no large expenditures anticipated.

o System Renewal

In preparing the forecasted future capital spending for this investment category, WNP took into consideration the recommendations from the 3rd party Asset Condition Assessment (ACA) report. The chart below illustrates how much WNP spent (Actuals) on System Renewal over the historic period of 2016-2020 compared to the LDC's forecasted CapEx plan for this investment category:

Figure 131: System Renewal – Historic Actuals versus Planned CapEx



In the above chart, for 2018, WNP has removed the CapEx cost of $1,692,893 for the replacement of a substation (MS4) as this was a "special" project, which if included, would have distorted the 5 year average history trend (i.e. increased from $363,522 to $702,101). However, it should be noted that in 2018, WNP had non-discretionary projects that it deferred so as to accommodate the substation replacement. Using an historic average of $363,522 as a comparison, WNP's 5-year forward plan yearly average of $300,000 is consistent.

Included in this investment category are:

- Pole-line rebuild projects – provisioning $185,000 each year for 2021-2025.
- Underground asset replacement projects in 2021, 2024 and 2025.
- Metering - replacement of broken / failed Smart meters – provisioning $25,000 per year.
- Replacement of "poor health" poles and transformers. WNP is budgeting $55,000 per year for 2021 to 2025 to replace poles that through testing have been found to be rotted. The table below illustrates the amount of CapEx spent by WNP on replacing "poor health" poles and transformers over the past 3 years"

Figure 132: CapEx Cost for Replacement of Poor Health Poles & Transformers

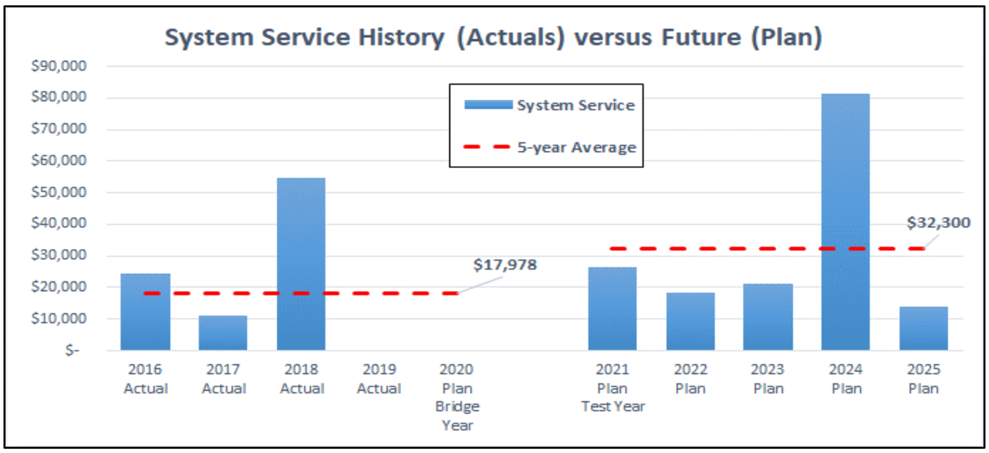
	2017	2018	2019	3-year Average
Replacement of "Poor Health" Poles & Transformers	$70,668	$69,163	$49,230	$63,020

Investment in System Renewal projects compliments customers' expectations as per the survey conducted by WNP in Q4 of 2019 which included customers ranking their top "high priority investments". As noted in "Section 5.4 Capital Expenditure Plan", the customer survey responses, the top "high priority" statements for investment prioritization was "Maintaining and upgrading equipment" (as ranked by 76% of all respondents).

- **System Service**

The chart below illustrates how much WNP spent (Actuals) on System Service over the historic period of 2016-2020 compared to the LDC's forecasted CapEx plan for this investment category:

Figure 133: System Service – Historic Actuals versus Planned CapEx



In the above chart, for 2016, WNP has removed the CapEx cost for the construction, build and energization of a new 2nd line 44kV feeder to Mount Forest as this was a "special" project, which if included, would have distorted the 5 year average history trend. (It should be noted that in 2016, WNP had non-discretionary projects that it deferred so as to accommodate the build of the new 2nd line 44kV feeder.)

Using an historic average of $17,978 as a comparison, WNP's 5-year forward plan yearly average of $32,300 is 80% above the historic yearly average. The main reason for this increase is the upgrade of the SCADA system planned for 2024 with a budgeted amount of $66,500. This SCADA system upgrade is required to meet latest software capability and security protocols, given that at this time, the current software will be almost ten years old.

Aside of this SCADA software project in 2024, System Service project yearly expenditures are fairly consistent and comprise of the following items:

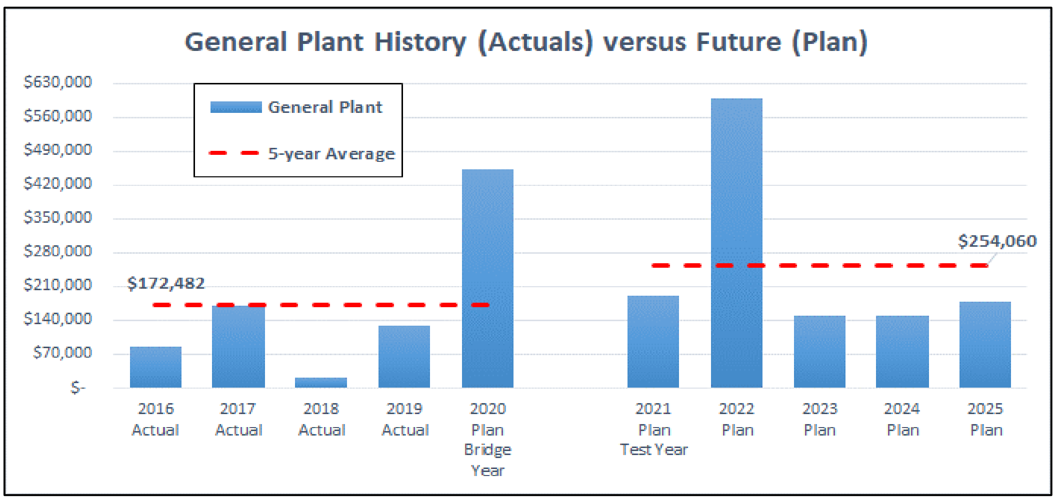
- SCADA – communications software upgrade (planned for 2021).

- Wholesale Metering Program – to replace primary revenue meters, cabinets and communication software to ensure connectivity to IESO. Different components of the Wholesale Metering equipment will be upgraded during the period 2021-2025.
- Smart Technology – annual investments to upgrade elements of the distribution system to connect with SCADA or provide demand loading information.

o **General Plant**

The chart below illustrates how much WNP spent (Actuals) on General Plant over the historic period of 2016-2020 compared to the LDC's forecasted CapEx plan for this investment category:

Figure 134: General Plant – Historic Actuals versus Planned CapEx



General Plant expenditure includes investment in IT, IT cyber-security, shop tools, fleet vehicle replacement and building renovations. In years 2020 and 2022, WNP are a replacing bucket truck in each year. In 2019, WNP deferred the replacement of a 2004 model year RBD bucket truck until 2022 as this vehicle is in good condition with minimal usage.

Figure 134 above illustrates the 5-year plan for System Access expenditures being above the historical spending and activities in this category. The primary reason for this yearly average increase is WNP's continued investment in:

- IT cyber-security to meet the Ontario Cybersecurity Framework[26] to provide the OEB with information pertaining to their Cybersecurity and Privacy Maturity implementations. WNP has embarked on a 5-year plan to meet all requirements and has made substantial headway in the first 3 covenants of the framework: Identify, Protect and Detect. The path forward will consist first of further refinement of the multitude of investments and procedures and will then move to the other two covenants of the framework, Respond and Recover. As these final two areas of the framework

[26] "Ontario Cyber-Security Framework" (version 1.0), December 6, 2017

incorporate and leverage all prior investments, the solid base achieved to date will provide an exceptionally effective foundation to further enhance cyber-security and Privacy mandates, and will ensure a successful completion to the Ontario cyber-security Framework within the targeted timeframe.

- IT Customer Information System (CIS) upgrade scheduled for 2022. This project includes CIS software upgrades for billing, customer service records, paperless work-orders and data/web-presentment. It is envisioned that new technology can be embraced to improve the experience provided to customers in accessing their electricity bill and viewing consumption history on-line with ease and securely.

5.4.3.2 Material Investments

The table below illustrates the programs included in WNP's planned 5-year capital investment forecast, using similar groupings as per Appendix 2-AA[27]:

Figure 135: CapEx Plan 2021 to 2025

	Category	**2021**	**2022**	**2023**	**2024**	**2025**
Project Name#1: **Special Projects**						
No special projects *(e.g. substation replacement)*		$0	$0	$0	$0	$0
Sub-Total		**$0**	**$0**	**$0**	**$0**	**$0**
Project Name#2: Annual Projects						
Pole & Transformer Replacements	*System Renewal*	$55,000	$55,000	$55,000	$55,000	$55,000
New Services	*System Access*	$60,000	$60,000	$60,000	$60,000	$60,000
Meter Replacements	*System Renewal*	$25,000	$25,000	$25,000	$25,000	$25,000
Smart Meter Re-seal and Reverification	*System Access*	$10,000	$10,000	$10,000	$10,000	$25,000
Sub-Total		**$150,000**	**$150,000**	**$150,000**	**$150,000**	**$165,000**
Project Name#3: Construction Projects						
Pole-Line Rebuild Projects	*System Renewal*	$185,000	$185,000	$185,000	$185,000	$185,000
Underground Projects	*System Renewal*	$75,000			$50,000	$50,000
Sub-Total		**$260,000**	**$185,000**	**$185,000**	**$235,000**	**$235,000**
Project Name#4: SCADA & Smart Technology						
SCADA	*System Service*	$15,000			$66,500	
SMART Technology	*System Service*	$10,000	$10,000	$10,000	$10,000	$10,000
Sub-Total		**$25,000**	**$10,000**	**$10,000**	**$76,500**	**$10,000**
Project Name#5: General Plant						
Wholesale Metering Program	*General Plant*	$1,500	$8,500	$11,000	$5,000	$4,000
Computer Hardware / Software / Cyber-Security	*General Plant*	$138,000	$170,550	$103,950	$83,300	$132,000
Building Renovation & Accessibility Compliance	*General Plant*	$50,000			$65,000	
Fleet Replacement	*General Plant*		$425,000	$45,000		$45,000
Tools	*General Plant*	$2,500	$2,500	$2,500	$2,500	$2,500
Sub-Total		**$192,000**	**$606,550**	**$162,450**	**$155,800**	**$183,500**
Total		**$627,000**	**$951,550**	**$507,450**	**$617,300**	**$593,500**

As detailed in Figure 135 above, the majority of WNP's capital expenditures over the forecast period consist of programs or budget items with relatively consistent annual spending with the exception of specific General Plant items (e.g. IT, fleet vehicle replacement and building renovation).

[27] Appendix 2-AA worksheet of the OEB's workbook Filing Requirements Chapter 2 Appendices

Materiality Threshold:

Filing Requirements[28] state that a distributor with a distribution revenue requirement less than $10 million may use $50,000 as a materiality threshold. WNP's 2021 proposed base revenue requirement is less than $10 million therefore the LDC has used $50,000 as a materiality threshold.

The table below illustrates in WNP's planned capital projects that equal or exceed the $50,000 materiality threshold:

Figure 136: CapEx Plan 2021 to 2025- Materiality Projects

	Category	2021	2022	2023	2024	2025
Project Name#2: Annual Projects						
Pole & Transformer Replacements	System Renewal	$55,000	$55,000	$55,000	$55,000	$55,000
New Services	System Access	$60,000	$60,000	$60,000	$60,000	$60,000
Project Name#3: Construction Projects						
Pole-Line Rebuild Projects	System Renewal	$185,000	$185,000	$185,000	$185,000	$185,000
Underground Projects	System Renewal	$75,000			$50,000	$50,000
Project Name#4: SCADA & Smart Technology						
SCADA	System Service	$15,000			$66,500	
Project Name#5: General Plant						
Computer Hardware / Software / Cyber-Security	General Plant	$138,000	$170,550	$103,950	$83,300	$132,000
Building Renovation & Accessibility Compliance	General Plant	$50,000			$65,000	
Fleet Replacement	General Plant		$425,000	$45,000		$45,000

The table below summarizes the main driver (or "trigger") for the material investment:

Figure 137: CapEx Plan 2021 to 2025: Driver for Materiality Projects

	Category	Main Driver of Project
Project Name#2: Annual Projects		
Pole & Transformer Replacements	System Renewal	Maintain system reliability and performance
New Services	System Access	Manage customer service requests
Project Name#3: Construction Projects		
Pole-Line Rebuild Projects	System Renewal	Planned and sustainable replacement of end of life poles
Underground Projects	System Renewal	Planned and sustainable replacement of end of life underground assets
Project Name#4: SCADA & Smart Technology		
SCADA	System Service	Investment in Operations Technology to provide and maintain controls
Project Name#5: General Plant		
Computer Hardware / Software / Cyber-Security	General Plant	Provide IT equipment required to support WNP's day-to-day business requirements
Building Renovation & Accessibility Compliance	General Plant	Compliance with the AODA act to provide a safe and accessible environment for able- and less-abled persons
Fleet Replacement	General Plant	A safe and reliable adequate fleet is required to support WNP's capital and O&M programs, as well as for outage response.

In this section, WNP is providing:

i. Detail of projects at the program level with a table of annual forecasted spending; or
ii. For specific General Plant items, details at the project level, along with forecasted spending.

[28] Ontario Energy Board Filing Requirements for Electricity Distribution Rate Applications – 2020 Edition for 2021 Rate Application - Chapter 2 Cost of Service – Section 2.0.8 Materiality Thresholds

CapEx Program: Annual Activities – Replacement of Pole & Transformer Assets.

Investment Category:System Renewal

5.4.3.2.A General Information on the Project / Program

The objective of this program is to replace individual pole and transformer assets that have been flagged as priority for replacement. These assets have been identified as priority replacement either by:

i. According to yearly pole testing, results have been identified as condition "Red" and pose a specific safety risk; or
ii. Have been identified by the utility's inspections as an asset that has been damaged or deteriorated and cannot be viably repaired or is a risk/safety hazard. Inspections include visual and infrared; or
iii. Poor asset health condition as determined by the third-party Asset Condition Assessment (ACA) study performed in 2020 by Kinectrics Inc.

The goal of the "Annual Activity Replacement" program is to proactively replace damaged or poor health assets prior to failure. The result is a balance between the cost of the replacement program and reliability impacts, and safety concerns associated with reactive replacement of these assets. The resulting annual "levelized" replacement rates allows for efficient use of internal resources.

The annual spending profile during the forecast period for this work is:

Figure 138: Forecasted CapEx: Annual Activities – Pole & Transformer Replacements

Program	Category	5-year Capital Investment Program Plan				
		2021	2022	2023	2024	2025
Annual Activities *(Pole & Transformer Replacements)*	System Renewal	$55,000	$55,000	$55,000	$55,000	$55,000

5.4.3.2.B Evaluation Criteria and Information Requirements for each Project / Program

5.4.3.2.B 1. Efficiency, Customer Value and Reliability

As noted in WNP's 2019 surveys, our customers expect a reliable system with minimal outages.

5.4.3.2.B 1a) Main Driver of the Project / Program

The primary driver of this program is to maintain system reliability and performance. WNP's asset register and the results of third-party Asset Condition Assessment as well as WNP's pole-testing program are the primary sources of information driving this program.

5.4.3.2.B 1b) Good Practice Addressing Existing Reliability Performance and Adapting to Future Challenges

WNP is a member of the Utilities Standard Form (USF) and, like many other LDCs in the province, uses USF engineering standards which satisfies the requirements applicable for this type of work.

5.4.3.2.B 1c) Priority of Investment Relative to Other Projects / Programs

The health condition and age profile of WNP's current pole and transformers populations are currently at a point where the occurrence of failure (excluding causes such as tree contact, vandalism and motor vehicle accidents) is infrequent in relation to the overall number of forced outages.

5.4.3.2.B 1d) Design, Scheduling, Funding Or Ownership Options

WNP has considered alternatives that involve increasing or decreasing the annual replacement target associated with this program. Based on the number of overall pole and transformer changes anticipated over the next five years through all capital projects and programs, WNP expects little change in the number of near-end of life poles and transformers upon completion of the 5-year plan.

The replaced poles and transformers will be owned 100% by WNP and funded through its capital program, that is the recovery of annual deprecation in its' rate-base to pay for asset replacement.

5.4.3.2.B 2. Safety

The planned and proactive replacement of assets with high failure and/or performance risk is inherently safer than reactive replacement as the working conditions can be controlled and the optimal replacement plans can be determined in advance. All design and construction work is completed in accordance with USF Standards fulfilling the requirements of Ontario Regulation 22/04 and to ensure that no undue safety hazards exist.

5.4.3.2.B 3. Cyber-Security and Privacy

Not applicable

5.4.3.2.B 4. Co-ordination and Interoperability

Once designs are complete, WNP will involve other authorities for review and approval if required. For instance inclusion of the County or Township if a pole-line passes over a highway or intersection or if a transformer is situated on Municipal property.

5.4.3.2.B 5. Environmental Benefits

Oil-filled leaking transformers can be removed from service and will be safely disposed of, using a credited environmental waste service.

5.4.3.2.B 6. Conservation and Demand Management

Not applicable

5.4.3.2.C Category-Specific Requirements for each Project / Program

In WNP's opinion, replacement of assets with a poor health condition are a critical part of an overall sustaining proactive replacement strategy that optimizes the overall lifecycle management of the utility's assets. A minimum number of overall replacements are required over the course of the 5-year plan to sustain asset performance at current levels. WNP's asset maintenance of poles and transformers are described in Section 5.3.2. Regular inspections and testing programs are designed to identify poor health poles and transformers for proactive replacement prior to failure.

The replacement of poles and transformers falls under the OEB categorization of System Renewal.

CapEx Program:	**New Services.**
Investment Category:	**System Access**

5.4.3.2.A General Information on the Project / Program

This expenditure is required to collect all costs for the installation and replacement of WNP plant that is driven by customer requests for new services or service upgrades.

A unique feature of WNP's service territory is the vast majority of WNP's customer demand work is related to single-customer requests for connections to new residences or for service upgrades to existing residences. Development of new subdivisions is relatively rare. Consequently, most new services or service upgrades require a single new or modified connection to existing WNP plant which in most cases requires pole replacement, reframing or other upgrades in order to meet the requirements of Ontario Regulation 22/04.

Start date, in-service date and expenditure timing over the planning horizon will be within the annual fiscal year. The annual spending profile during the forecast period for this work is:

Figure 139: Forecasted CapEx: New Services & Service Upgrades

Program	Category	5-year Capital Investment Program Plan				
		2021	**2022**	**2023**	**2024**	**2025**
New Services & Upgrades	System Access	$60,000	$60,000	$60,000	$60,000	$60,000

5.4.3.2.B Evaluation Criteria and Information Requirements for each Project / Program

5.4.3.2.B 1. Efficiency, Customer Value and Reliability

This program is justified on the basis of customer service requests that are relatively consistent year-over-year in terms of both the number of requests and the investments required to complete the connections.

5.4.3.2.B 1a) Main Driver of the Project / Program

The primary driver of this activity is customer service requests. This program enables WNP to satisfy its' asset management objective (and corporate objectives) of meeting the needs of its' customers as well as fulfilling regulatory obligations as per the Distribution System Code.

5.4.3.2.B 1b) Good Practice Addressing Existing Reliability Performance and Adapting to Future Challenges

WNP is a member of the Utilities Standard Form (USF) and, like many other LDCs in the province, uses USF engineering standards which satisfies the requirements applicable for this type of work.

5.4.3.2.B 1c) Priority of Investment Relative to Other Projects / Programs

This activity is considered non-discretionary, as there are regulatory obligations to process customer service requests in a timely manner. WNP annual budget is based on a rolling 3-year average of historical costs.

5.4.3.2.B 1d) Design, Scheduling, Funding Or Ownership Options

Given the regulatory requirements to process these customer-driven requests as well as the requirements of Ontario Regulation 22/04 in relation to new or modified connections to WNP's system, few alternatives exist for this activity. For each individual connection however, WNP does consider whether the connection or upgrade can be accommodated with a minimal scope of work (e.g. connection to existing Secondary Bus without anchoring or pole changes), while meeting the applicable safety requirements.

New Services will be funded through its capital program, that is the recovery of annual deprecation in its' rate-base to pay for the materials and labour to connect the services.

5.4.3.2.B 2. Safety

The design and construction of new or modified service connections is completed in accordance with USF Standards to meet the requirements of Ontario Regulation 22/04 and to ensure that no undue safety hazards exist.

5.4.3.2.B 3. Cyber-Security and Privacy

Customer connections requests are managed in accordance with relevant privacy legislation.

5.4.3.2.B 4. Co-ordination and Interoperability

Once designs are complete, WNP will involve other authorities for review and approval if required. For instance inclusion of the County or Municipality if the new connection requires crossing a highway or intersection.

5.4.3.2.B 5. Environmental Benefits

Not applicable.

5.4.3.2.B 6. Conservation and Demand Management

Not applicable.

5.4.3.2.C Category-Specific Requirements for each Project / Program

The projects for this activity relate mostly to individual new or modified connections to residential and small business properties. Once requests are received and customers have met certain obligations, the timing of completing these connections is prescribed by the Distribution System Code (i.e. the LDC having 5 business to connect to a new service (LV) from the day on which all applicable service conditions are satisfied.

New Services falls under the OEB categorization of System Access.

Over the past 5 years, WNP has experienced a stable customer-base with the number of metered customer accounts increasing at less than an average of 1% per year. A modest number of requests are received each year for newly constructed homes. As demonstrated by the LDC’s service quality statistics, WNP’s performance in connecting new services is above the minimum target set by the regulator.

CapEx Program:	**Pole-Line Rebuild Projects.**
Investment Category:	**System Renewal**

5.4.3.2.A General Information on the Project / Program

This program represents the most significant portion of WNP's asset management objectives. The goal of the "Pole-Line Rebuild Project" program is to achieve a sustainable replacement rate that results in proactive replacement of many poles near end of life, but prior to failure. The result is a balance between the cost of the replacement program and relatively larger costs, reliability impacts, and safety concerns associated with reactive replacement of these assets. The resulting annual "levelized" replacement rates allows for efficient use of internal resources.

Pole line rebuild projects focus on replacing areas where assets located along the route circa vintage 1975-1980 and approaching the end of their life. The existing Class 6 poles will be replaced with Class 3 poles to meet current construction and safety standards. In addition, the porcelain insulators will be replaced with safer polymer type insulators.

Start date, in-service date and expenditure timing over the planning horizon will be within the annual fiscal year. The annual spending profile during the forecast period for this work is:

Figure 140: Forecasted CapEx: Pole Line Rebuild Projects

Program	Category	5-year Capital Investment Program Plan				
		2021	**2022**	**2023**	**2024**	**2025**
Pole Line Rebuild Projects	System Renewal	$185,000	$185,000	$185,000	$185,000	$185,000

5.4.3.2.B Evaluation Criteria and Information Requirements for each Project / Program

5.4.3.2.B 1. Efficiency, Customer Value and Reliability

The target replacement rate for the Line Rebuild program is approximately 48 poles per year. The program's annual replacement target is based on the number, age and overall condition of in-service poles. Annual program costs are based on rolling annual average cost from 2016-2019, approximately $3,500 per pole.

WNP has consistently completed similar volumes of line rebuild work in recent years and does not anticipate significant risks in achieving the annual targets included in the 5-year plan. The priority associated with any given pole or line section within this program will depend on a number of considerations, including the condition, age and health criticality of in-service poles, as well as opportunities to create efficiencies between WNP's planned pole replacements and other third-party projects (e.g. road/sidewalk re-surfacing by the Township).

5.4.3.2.B 1a) Main Driver of the Project / Program

The primary driver of this program is the planned and sustainable replacement of end of life poles. Secondary drivers are maintaining reliability, optimizing the overall lifecycle costs associated with poles, as well as maintaining system performance. WNP's asset register and the results of third-party Asset Condition Assessment as well as WNP's pole-testing program are the primary sources of information driving this program.

5.4.3.2.B 1b) Good Practice Addressing Existing Reliability Performance and Adapting to Future Challenges

WNP is a member of the Utilities Standard Form (USF) and, like many other LDCs in the province, uses USF engineering standards which satisfies the requirements applicable for this type of work.

5.4.3.2.B 1c) Priority of Investment Relative to Other Projects / Programs

The health condition and age profile of WNP's current pole population is currently at a point where the occurrence of pole failure (excluding causes such as tree contact, vandalism and motor vehicle accidents) is infrequent in relation to the overall number of forced outages.

WNP has considered alternatives that involve increasing or decreasing the annual replacement target associated with this program. Based on the number of overall pole changes anticipated over the next five years through all capital projects and programs, WNP expects little change in the number of near-end of life poles upon completion of the 5-year plan. Over time, increasing the annual pole replacement targets would effectively decrease the average in-service pole age and the average age of poles being replaced. In WNP's opinion, the LDC does not believe this to be warranted based on the historical performance and failure rates of these assets.

5.4.3.2.B 1d) Design, Scheduling, Funding Or Ownership Options

Decreasing the annual pole replacement targets would result in an increasing liability associated with high-risk in-service poles. This could quickly lead to a cycle where the increasing reactive replacement costs due to more frequent unexpected pole failures and a greater number of deficiencies identified during patrols lead to less budget capacity to fund the proactive replacement, which further decreases the annual number of poles replaced proactively. Adopting this approach over a 5-year plan, could result in a surge of future replacements, requiring both increased capital and O&M budgets at the time of WNP's next Cost of Service application.

5.4.3.2.B 2. Safety

The planned and proactive replacement of assets with high failure and/or performance risk is inherently safer than reactive replacement as the working conditions can be controlled and the optimal replacement plans can be determined in advance. All design and construction work is completed in accordance with USF Standards fulfilling the requirements of Ontario Regulation 22/04 and to ensure that no undue safety hazards exist.

5.4.3.2.B 3. Cyber-Security and Privacy

Not applicable

5.4.3.2.B 4. Co-ordination and Interoperability

Once designs are complete, WNP will involve other authorities for review and approval if required. For instance inclusion of the County or Municipality if the pole-line passes over a highway or intersection.

5.4.3.2.B 5. Environmental Benefits

Not applicable

5.4.3.2.B 6. Conservation and Demand Management

Not applicable

5.4.3.2.C Category-Specific Requirements for each Project / Program

In WNP's opinion, pole-line rebuild projects are a critical part of an overall sustaining proactive replacement strategy that optimizes the overall lifecycle management of the utility's assets. A minimum number of overall replacements are required over the course of the 5-year plan to sustain asset performance at current levels. Though age is not the only factor influencing the replacement priority, there is often a strong relationship between the age of a pole and the overall condition of the pole and associated line hardware. The majority of poles replaced by this program will have been in service in excess of 45 years, which exceeds the typical useful life for this asset.

WNP's asset management of pole assets is described in Section 5.3.2. Regular inspections and testing programs are designed to identify high-risk poles for proactive replacement prior to failure. Any reduction in the overall replacement targets associated with this program may potentially increase one-off replacements at a higher cost per pole.

Below is a list of pole line projects with approx. costs for years 2021 and 2022.

Figure 141: Pole Line Rebuild Projects

2021 Poleline Rebuild Projects	
Project Description	**Est. Cost**
Smith St. (Frederick to Conestoga)	$ 61,000
Ayshire	$ 60,000
Eliza (Leonard to Carrol)	$ 34,000
Misc Road Crossing Poles	$ 30,000

2022 Poleline Rebuild Projects	
Project Description	**Est. Cost**
Holstein	$ 52,000
Wellington Rs 109	$ 26,000
Smith St. (Preston to Agrison)	$ 60,500
Oxford	$ 24,000
Misc Road Crossing Poles	$ 22,500

Pole-line re-build projects fall under the OEB categorization of System Renewal.

CapEx Program:	**Underground Projects.**
Investment Category:	**System Renewal**

5.4.3.2.A General Information on the Project / Program

Underground projects focus on replacing areas where assets are circa vintage 1965-1970 and approaching the end of their life. Start date, in-service date and expenditure timing over the planning horizon will be within the annual fiscal year.

The annual spending profile during the forecast period for this work is:

Figure 142: Forecasted CapEx: Underground Projects

Program	Category	5-year Capital Investment Program Plan				
		2021	**2022**	**2023**	**2024**	**2025**
Underground Projects	System Renewal	$75,000			$50,000	$50,000

5.4.3.2.B Evaluation Criteria and Information Requirements for each Project / Program

5.4.3.2.B 1. Efficiency, Customer Value and Reliability

The goal of the “Underground Project” program is to achieve a sustainable replacement rate that results in proactive replacement of underground assets nearing their end of life but prior to failure. The result is a balance between the cost of the replacement program and relatively larger costs, reliability impacts, and safety concerns associated with reactive replacement of these assets.

5.4.3.2.B 1a) Main Driver of the Project / Program

The primary driver of this program is the planned and sustainable replacement of end of life underground assets including vaults, transformers and conduit. Secondary drivers are maintaining reliability, optimizing the overall lifecycle costs associated with underground distribution equipment, as well as maintaining system performance. WNP’s asset register and the results of third-party Asset Condition Assessment are the primary sources of information driving this program.

5.4.3.2.B 1b) Good Practice Addressing Existing Reliability Performance and Adapting to Future Challenges

WNP is a member of the Utilities Standard Form (USF) and, like many other LDCs in the province, uses USF engineering standards which satisfies the engineering requirements applicable for this type of work.

5.4.3.2.B 1c) Priority of Investment Relative to Other Projects / Programs

The health condition and age profile of WNP's underground assets is currently at a point where the LDC needs to consider replacing equipment during the 5-year plan period of 2021-2025. Extending the life of the assets beyond these dates may increase the probability of equipment failure resulting in outages.

5.4.3.2.B 1d) Design, Scheduling, Funding Or Ownership Options

Underground assets are owned by WNP. As noted above, these underground assets are at or very near to the end of their useful life, extending the life of the assets beyond these dates may increase the probability of equipment failure resulting in outages. Delaying their replacement could result in a surge of future replacements, requiring both increased capital and O&M. All assets will be owned and managed by WNP.

5.4.3.2.B 2. Safety

The planned and proactive replacement of assets with high failure and/or performance risk is inherently safer than reactive replacement as the working conditions can be controlled and the optimal replacement plans can be determined in advance. All design and construction work is completed in accordance with USF Standards fulfilling the requirements of Ontario Regulation 22/04 and to ensure that no undue safety hazards exist.

5.4.3.2.B 3. Cyber-Security and Privacy

Not applicable

5.4.3.2.B 4. Co-ordination and Interoperability

Once designs are complete, WNP will involve other authorities for review and approval if required. For instance inclusion of the County or Municipality if the underground equipment is located on Municipality land.

5.4.3.2.B 5. Environmental Benefits

Not applicable.

5.4.3.2.B 6. Conservation and Demand Management

Not applicable.

5.4.3.2.C Category-Specific Requirements for each Project / Program

In WNP's opinion, replacement of underground assets are a critical part of an overall sustaining proactive replacement strategy that optimizes the overall lifecycle management of the utility's assets. A minimum number of overall replacements are required over the course of the 5-year plan to sustain asset performance at current levels.

Underground projects fall under the OEB categorization of System Renewal.

CapEx Program:	**Supervisory Control and Data Acquisition (SCADA).**
Investment Category:	**System Service**

5.4.3.2.A General Information on the Project / Program

This budget item includes:

- In 2021, upgrading SCDADA communications software. The current software was installed in 2015 and at times has connectivity issues when communicating to/from substations.
- In 2024, the utility will be upgrading SCADA. The current SCADA solution was installed in 2015

Start date, in-service date and expenditure timing over the planning horizon will be within the annual fiscal year. The annual spending profile during the forecast period for this work is:

Figure 143: Forecasted CapEx: SCADA

Program	Category	5-year Capital Investment Program Plan				
		2021	2022	2023	2024	2025
SCADA	System Service	$15,000			$66,500	

5.4.3.2.B Evaluation Criteria and Information Requirements for each Project / Program

5.4.3.2.B 1. Efficiency, Customer Value and Reliability

As noted in WNP's 2019 surveys, our customers expect a reliable system with minimal outages. WNP uses SCADA to collect loading data from its substations to assist the utility in monitoring and balancing load across its' distribution system therefore potentially minimizing the risk of overloading the system, asset failure and outages.

5.4.3.2.B 1a) Main Driver of the Project / Program

The primary driver of this program is the investment in Operations Technology (OT) to provide and maintain controls enabling Operations to manage substation loading, control feeder circuits remotely and to protect the distribution system using SCADA.

5.4.3.2.B 1b) Good Practice Addressing Existing Reliability Performance and Adapting to Future Challenges

This investment assists WNP in operating an efficient and reliable distribution system. The SCADA system facilitates Smart Grid technology, is connected to all the LDC's substations and able to provide control to the newer substations (MS2 and MS3) where reclosers are installed.

5.4.3.2.B 1c) Priority of Investment Relative to Other Projects / Programs

This investment is a high priority within the General Plant category as SCADA provides additional oversight of the utility's distribution system. For instance control relays installed at the rebuilt MS2 and MS3 substations allow for advanced protection schemes as well as SCADA-control of the stations.

5.4.3.2.B 1d) Design, Scheduling, Funding Or Ownership Options

Continued replacement of OT assets, such as SCADA, on predictable cycles will result in the most efficient use of internal resources together with the lowest program costs in the long term. The asset will be fully owned and funded by WNP.

5.4.3.2.B 2. Safety

Not applicable

5.4.3.2.B 3. Cyber-Security and Privacy

Continued investment in replacing OT hardware and software as well as leveraging on all prior investments will provide an exceptionally effective foundation to further enhance cyber-security and will ensure a successful completion to the Ontario cyber-security Framework within the targeted timeframe. This investment will also address some of the findings from third-party external SCADA penetration testing audits conducted in 2017 and 2019.

5.4.3.2.B 4. Co-ordination and Interoperability

Not applicable as OT software or hardware are not shared with other parties.

5.4.3.2.B 5. Environmental Benefits

Not applicable

5.4.3.2.B 6. Conservation and Demand Management

Not applicable

5.4.3.2.C Category-Specific Requirements for each Project / Program

In WNP's opinion, this prudent investment is for the consistent replacement of OT hardware and software on predictable cycles that align with warranty coverage and expected useful lives of assets. Deviation from this approach could result in failures outside of warranty periods, increase risk of system failures, unpredictable annual costs, and cybersecurity vulnerabilities.

CapEx Program:	**Computer – Hardware and Software.**
Investment Category:	**General Plant**

5.4.3.2.A General Information on the Project / Program

This budget item includes the annual replacement of workstations, IT network equipment and miscellaneous hardware on regular cycles, with relatively consistent year-over-year replacements. The organization's practice is to replace IT hardware assets every five years at the end of their standard manufacturer warranty period. In addition:

- In 2021, WNP will be replacing its virtual servers (budget amount of $63,000). The current virtual servers were installed in 2016 and included a 5-year manufacturer's warranty and 24/7 service package.
- In 2022, the utility will be upgrading its' Customer Information System (CIS) software used for billing, account management and collections. This upgrade will also include a software upgrade to the LDC's current web-presentment solution. Web-presentment is a customer-driven solution enabling customers to access their account and energy usage through an on-line portal.

Both the above items were included in WNP's 2015 DSP as IT capital investment projects in 2016 and were implemented according to plan.

Start date, in-service date and expenditure timing over the planning horizon will be within the annual fiscal year. The annual spending profile during the forecast period for this work is:

Figure 144: Forecasted CapEx: IT Hardware & Software

Program	Category	5-year Capital Investment Program Plan				
		2021	**2022**	**2023**	**2024**	**2025**
IT - Hardware & Software	General Plant	$111,400	$160,550	$98,950	$41,300	$122,000

5.4.3.2.B Evaluation Criteria and Information Requirements for each Project / Program

5.4.3.2.B 1. Efficiency, Customer Value and Reliability

Customer Access To and Retrieval of Data: Currently, WNP provides customer access to consumption data in an electronic format through a solution called CustomerConnect, provided by the company's Customer Information Services (CIS) provider. This solution enables customers to register on-line to view their consumption data as well as payment history. WNP's existing CIS vendor contract is due for renewal in 2022. The LDC has started preliminary research to identify potential CIS vendors and, in 2021, the LDC will undertake a more thorough study of possible CIS alternatives together with web-presentment and/or mobile applications solutions that can provide consumption data to our customers. In its capital investment program, WNP has budgeted $130,000 in 2022 to include CIS upgrade or replacement, paperless work orders and customer-access to consumption data program/application.

5.4.3.2.B 1a) Main Driver of the Project / Program

The primary driver of this program is the investment to provide IT equipment required to support WNP's day-to-day business requirements. And secondly, provide a web-presentment solution that enables customers to access their data and billing information.

5.4.3.2.B 1b) Good Practice Addressing Existing Reliability Performance and Adapting to Future Challenges

These investments allow WNP it operate a secure and reliable network to run core operational processes and applications to deliver excellent customer service to its' customers and meet regulatory requirements concerning metering, billing and collections.

5.4.3.2.B 1c) Priority of Investment Relative to Other Projects / Programs

This investment is a high priority within the General Plant category as the LDC's IT infrastructure underpins the critical office functions of the business, namely customer service, billing and account collections.

5.4.3.2.B 1d) Design, Scheduling, Funding Or Ownership Options

Continued replacement of IT assets on predictable cycles will result in the most efficient use of internal resources, the lowest program costs in the long term and an enhanced level of cybersecurity together with privacy protocols.

All IT hardware and software assets will be owned by WNP and will be funded through its capital program, that is the recovery of annual deprecation in its' rate-base to pay for the materials and labour to install the necessary equipment.

5.4.3.2.B 2. Safety

Not applicable

5.4.3.2.B 3. Cyber-Security and Privacy

Continued investment in replacing IT hardware and software as well as leveraging on all prior investments will provide an exceptionally effective foundation to further enhance cyber-security and privacy mandates, and will ensure a successful completion to the Ontario cyber-security Framework within the targeted timeframe. This investment will also address some of the findings from third-party external penetration testing audits conducted in 2017 and 2019.

5.4.3.2.B 4. Co-ordination and Interoperability

Not applicable as IT networks, software or hardware are not shared with other parties.

5.4.3.2.B 5. Environmental Benefits

All assets replaced will be disposed of in a safe and environmental manner.

5.4.3.2.B 6. Conservation and Demand Management

Not applicable

5.4.3.2.C Category-Specific Requirements for each Project / Program

In WNP's opinion, this prudent investment is for the consistent replacement of IT hardware and software on predictable cycles that align with warranty coverage and expected useful lives of assets. Deviation from this approach could result in failures outside of warranty periods, increase risk of system failures, unpredictable annual costs, and cybersecurity vulnerabilities.

Furthermore, the utility needs to keep pace with new technology including its web-presentment self-serve solutions to its customers whilst managing data privacy. In addition, this investment compliments WNP's corporate "Risk Analysis and Mitigation Plan" (Risk Register) which cites cyber-security as a medium probability threat with a high impact if there is a breach.

IT hardware/software projects fall under the OEB categorization of General Plant.

CapEx Program:	**Building Renovations.**
Investment Category:	**General Plant**

5.4.3.2.A General Information on the Project / Program

This expenditure is required to continue with building renovations at WNP's offices in Mount Forest.

In the LDC's 2012 Cost of Service application (EB-2011-0249), there was acceptance for the Applicant to secure financing through long-term debt to gut or build-new the building at the Mount Forest location. Included with its' application, the LDC filed a third-party's building assessment report that identified several deficiencies. However, a 3rd party study completed in Q2 of 2013 and commissioned by WNP performed an assessment of the LDC's substations and identified deficiencies that required attention, especially given two substations are over 40 years old and hence the requirement of a strategy for replacement. As a result of this substation assessment, WNP prioritized the building a new substation instead of a new office at Mount Forest. (The LDC filed an IRM application for 2014 Distribution Rates (file number EB-2013-0178 including an Incremental Capital Module (ICM) to replace and build a new substation (MS2 Substation). Application EB-2013-017 was approved and the Decision and Order of March 13th 2014 included approval of the ICM for WNP to proceed with replacing the aged and deteriorated MS2 Substation.)

Since 2012, WNP has been completing building renovations to address the deficiencies; however there are a couple of items that still require attention:

- Compliance with Accessibility for Ontarians with Disabilities Act (AODA) for a washroom for a person who is less abled; and
- Repairs to stop or prevent water leakages from the flat roof spanning the whole building.

Start date, in-service date and expenditure timing over the planning horizon will be within the annual fiscal year.

The annual spending profile during the forecast period for this work is:

Figure 145: Forecasted CapEx: Building Renovations

Program	**Category**	5-year Capital Investment Program Plan				
		2021	**2022**	**2023**	**2024**	**2025**
Building Renovation	General Plant	$50,000			$65,000	

WNP is planning to address compliance with AODA for a washroom for a less-abled person in 2021 and replace the flat roof in 2024.

5.4.3.2.B Evaluation Criteria and Information Requirements for each Project / Program

5.4.3.2.B 1. Efficiency, Customer Value and Reliability

This project is required to fulfill the Accessibility for Ontarians with Disabilities Act (AODA), various building code requirements as well as to provide a safe and secure office environment for WNP employees as well as customers and contractors visiting the building

5.4.3.2.B 1a) Main Driver of the Project / Program

The primary driver of this program is compliance with the AODA act to provide a safe and accessible environment for able- and less-abled persons. A second driver is replace the flat roof to make the building waterproof, therefore providing protection from the elements for staff and customers.

5.4.3.2.B 1b) Good Practice Addressing Existing Reliability Performance and Adapting to Future Challenges

The utility has demonstrated good utility practice by prioritizing investment in replacing substations to maintain reliability of supply for the benefit of all stakeholders. The significant investment in replacing two aged substations in 2014 and 2018 could have paid for a brand new office for the utility.

5.4.3.2.B 1c) Priority of Investment Relative to Other Projects / Programs

As noted above, the utility has prioritized reliability of supply above the working conditions of the current building. In its' 2012 Cost of Service rate application, all parties involved in the application gave approval for WNP to build a new office building. However, these funds were diverted to financing the replacement of an aged substation in 2014. Since 2014, WNP has invested money in building renovations to meet compliance requirements, such as making the building accessible for customers who are in a wheelchair as well as address other building deficiencies.

5.4.3.2.B 1d) Design, Scheduling, Funding Or Ownership Options

WNP is not looking to build a new office building, which based on building designs commission in 2012/2013, would cost approx. $2,000,000; instead, the utility is planning to renovate the existing building to (i) meet AODA compliance requirements and (ii) make the roof water-tight. WNP would continue to own the building, as per now, and pay for renovations through its capital program, that is the recovery of annual deprecation in its' rate-base to pay for the necessary materials and labour.

5.4.3.2.B 2. Safety

The design and construction of renovations would comply with building code requirements.

5.4.3.2.B 3. Cyber-Security and Privacy

Not applicable.

5.4.3.2.B 4. Co-ordination and Interoperability

Not applicable.

5.4.3.2.B 5. Environmental Benefits

Not applicable.

5.4.3.2.B 6. Conservation and Demand Management

Not applicable.

5.4.3.2.C Category-Specific Requirements for each Project / Program

This project is required to fulfill the Accessibility for Ontarians with Disabilities Act (AODA), various building code requirements as well as to provide a safe and secure office environment for WNP employees as well as customers and contractors visiting the building.

CapEx Program:	Transport – Replacement of RBD.
Investment Category:	General Plant

5.4.3.2.A General Information on the Project / Program

This expenditure is required for the purchase of a new RBD bucket truck in 2022. The current RBD bucket truck is a 2004 model year. In WNP's 2015 DSP, the LDC included the replacement of this fleet vehicle in its 2016-2020 capital investment program to be replaced in 2020; however, WNP deferred the purchase in 2020 as the vehicles was still in good condition.

The annual spending profile during the forecast period for this work is:

Figure 146: Forecasted CapEx: Transport – RBD Bucket Truck Replacement

Program	Category	5-year Capital Investment Program Plan				
		2021	2022	2023	2024	2025
Transport - Replacement RBD	General Plant		$425,000			

5.4.3.2.B Evaluation Criteria and Information Requirements for each Project / Program

5.4.3.2.B 1. Efficiency, Customer Value and Reliability

As noted below, the particular vehicle for replacement will be 18 years old in 2022 and therefore there are concerns about the on-going reliability of this fleet vehicle if it is not replaced. Maintenance and repairs costs to prolong the life of the vehicle will become more expensive than the market value of the asset.

5.4.3.2.B 1a) Main Driver of the Project / Program

The primary driver of this program is this particular fleet vehicle will be 18 years old in 2022. A safe and reliable adequate fleet is required to support WNP's capital and O&M programs, as well as for outage response. The overall type, age and condition of fleet assets is the primary source of information used to justify this program.

5.4.3.2.B 1b) Good Practice Addressing Existing Reliability Performance and Adapting to Future Challenges

WNP maintains its fleet is based on an unrelenting approach to tracking current vehicle conditions and operating (repair) costs as well as following routine service and maintenance inspections.

5.4.3.2.B 1c) Priority of Investment Relative to Other Projects / Programs

The overall requirement to maintain an adequate fleet compliment to meet WNP's day-to-day business requirements is considered a non-discretionary item and is ranked among the highest priority programs within the General Plant category. Replacements are based on the expected economical useful life of each type of equipment and are staggered to maintain a relatively constant age profile for in-service fleet assets.

5.4.3.2.B 1d) Design, Scheduling, Funding Or Ownership Options

In WNP's opinion, sustained replacement of fleet assets on predictable cycles will result in the lowest program costs in the long term. WNP will own this asset 100% and will secure a loan from a financial institution to fund its purchase.

5.4.3.2.B 2. Safety

WNP's lifecycle management of fleet assets results in the availability of safe, reliable vehicles to support operational activities of the utility.

5.4.3.2.B 3. Cyber-Security and Privacy

Not applicable.

5.4.3.2.B 4. Co-ordination and Interoperability

Not applicable.

5.4.3.2.B 5. Environmental Benefits

Newer fleet assets are generally more fuel efficient than the vehicles being replaced.

5.4.3.2.B 6. Conservation and Demand Management

Not applicable.

5.4.3.2.C Category-Specific Requirements for each Project / Program

Investment in fleet replacements is planned at a pace based on an optimized lifecycle management approach each fleet item, i.e. age, condition and use in the field. This approach results in a sustainable fleet program that provides Operations staff with safe and reliable vehicles. Furthermore, it is a judgement decision to replace a vehicle when annual repair/maintenance costs are nearing the net book value of the asset therefore helping to control the LDC's O&M expenses.

Appendices

Appendix A: Third Party Review of WNP Distribution System Plan

KINECTRICS

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October 8, 2020

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Dear Jim,

The purpose of this letter is to provide a brief summary of the work involving Kinectrics assessment of the Distribution System Plan (DSP) produced by Wellington North Power Inc. (WNPI) in support of their rate application to Ontario Energy Board (OEB).

WNPI engaged services of Kinectrics Inc (Kinectrics) to review contents of WNPI's DSP document to assess its alignment with OEB's Filing Requirements for Electricity Transmission and Distribution Applications, Chapter 5 (Chapter 5), evaluate existing WNPI's Asset Management process vis-à-vis similar processes at other Ontario Local Distribution Companies, and to recommend any changes to improve the document based on Kinectrics expertise from assisting other Ontario's Local Distribution Companies with drafting their DSPs.

The engagement involved the following steps:

1. Initial review of the DSP by Kinectrics specifically focusing on the document's alignment with Chapter 5 requirements and identification of gaps if any
2. Refinements to the original draft based on Kinectrics comments and WNPI's feedback
3. Review of the modified DSP by Kinectrics once the discussed changes were incorporated in the document by WNPI.

Following the review Kinectrics is of the opinion that the DSP is aligned well with the Chapter 5 document and provides all the required information in the prescribed format and with appropriate level of detail, particularly regarding the following aspects:

1. Using sound Asset Management Process in developing Capital and OM&A long-term plans, specifically relying on quantified Asset Condition Assessment (ACA) study to support System Renewal requirements.
2. Incorporating to the extent possible input from the consultations with the customers in determining investment requirements.
3. Participating in coordinated planning with appropriate third parties.
4. Tracking performance measures to facilitate continuous improvement process.

Kinectrics recommends that in the next version of the DSP WNPI should implement quantified prioritization methodology and increase number of asset categories to enable their inclusion in the ACA.

Sincerely,

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Appendix B. Asset Condition Assessment – Kinectrics Inc.

WELLINGTON North Power Inc
2020 ASSET CONDITION ASSESSMENT

Kinectrics Report: K-814214-RA-0001-R00

May 21, 2020

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WELLINGTON NORTH POWER INC
2020 ASSET CONDITION ASSESSMENT

Kinectrics Report: K-814214-RA-0001-R00

May 21, 2020

Prepared by:

____

Fan Wang Ph. D. P. Eng.
Senior Engineer/Scientist

Reviewed and Approved by:

____

Yury Tsimberg M. Eng. P. Eng.
Director – Asset Management

Dated: 2020-05-21

To: Wellington North Power Inc
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Revision History

Revision Number	Date	Comments	Approved
R00	2020-05-08	Draft	
R00	2020-05-21	Final	

EXECUTIVE SUMMARY

In 2020 Wellington North Power Inc (WNP) determined a need to perform a condition assessment of its key distribution assets. WNP selected and engaged Kinectrics Inc. (Kinectrics) to assist with this work. This report presents the results of 2020 Asset Condition Assessment (ACA) study, and is based on the available condition data as of the end of December 2019.

Asset Categories Considered

The asset groups included in the 2020 ACA are as follows, including 6 categories or 8 sub-categories:

- MS Transformers
- MS Switchgear
- MS Load Switches
- Pad Mounted Transformers
- Pole Mounted Transformers (1-Phase, 3-Phase)
- Poles (4 kV, 44 kV)

For each asset category, available data was assessed, Health Index distribution was determined, and condition-based Flagged for Action plan was developed.

Some of these asset groups, such as station transformers and station breakers, require that an individual asset unit get replaced before its failure. A risk based prioritized list was developed for each of these groups, indicating the projected flagged for action year of each individual unit.

Overall Health Index Distribution

In general, 6 of the 8 sub-categories had over 80% of their units classified as “good” or “very good”, and 3 of the 8 sub-categories had an average Health Index score of greater than 80%.

With respect to the asset categories of concern, Pole Mounted Transformers (1-Phase) had 15% of units classified as “poor” or “very poor”, with an average Health Index below 70%.

Flagged for Action Plans

In general, no sub-categories showed major backlog in terms of flagged for action numbers in the first year. All sub-categories either had no unit flagged for action, or had their flagged for action plans showing smooth variation throughout the next 10 years

In the short term, it was determined that MS Switchgear and MS Load Switches had the highest percentages of units flagged for action in first year, being 16.7% of population in both cases. Given the fact that the population was 6 in both cases, this represented 1 unit respectively.

Furthermore, within the next 10 years, over 30% of the Pad Mounted Transformers and Pole Mounted Transformers (both 1-Ph and 3-Ph) are expected to require some action to be taken to address their condition.

The actual replacement plans might be only a subset of the Flagged for Action plans after WNP's review based on WNP's maintenance and replacement strategy.

Data Availability

The asset groups of MS Transformers, MS Switchgear, MS Load Switches and Poles (both 4 kV and 44 kV) had relatively complete data sets, with both test and detailed inspection data available in addition to age information.

Pad Mounted Transformers and Pole Mounted Transformers (both 1-Phase and 3-Phase) had overall inspection data, infrared test data and age information.

Recommendations

Compared to other local distribution utilities, WNP had above average amount of data for 2020 ACA study, based on which informed decisions could be made. For the purpose of improving ACA study in the future, it is recommended that WNP enhance data collection in the following areas:

- Acquisition of loading data for all the transformers.
- Operation cycle counts for MS Switchgear and Load Switches, as well as manufacturer specification limits on contact resistance and operation cycles, for the purpose of estimating switch degradation due to usage.
- Adoption of a single file (instead of separate files) that is extractable (e.g. excel spreadsheet) to contain the inspection and test data for all the individual units, for the asset groups inside stations (MS Transformers, MS Switchgear, MS Load Switches).
- Historic records of asset removal for all the asset groups, for the purpose of developing WNP specific asset degradation curves in the future.

The results presented in this study are based solely on asset condition as determined by available data. Note that there are numerous other considerations that may influence WNP's planning process. Among these are obsolescence, system growth, corporate priorities, technological advancements, etc.

DEFINITIONS

Terminology	Acronym	Definition
Age Limiter	AL	The final HI assigned to an individual asset may also be limited by the asset's age. The AL is generally equal to the cumulative survival probability at a given age of an asset group. If the calculated HI is less than or equal to the AL, the final HI assigned is the calculated HI. Otherwise, the final HI assigned is equal to the AL.
Asset Condition Assessment	ACA	Process of using asset information to determine the condition of assets. Condition data can include nameplate information, test results, asset inspection records, corrective maintenance records, operational experience, etc.
Condition Parameter Score	CPS	Score of an asset for a particular condition parameter. In this study, the scoring system used ranges from 0 through 4 (0 = worst; 4 = best).
Condition Parameters	CP	Asset characteristics or properties that are used to derive the HI.
Criticality		Metric used to quantify consequence of failure in this methodology.
Criticality Index	CI	Index used to determine asset Criticality. CI ranges from 0% to 100%, with 100% representing the unit with the highest possible consequence of failure.
Cumulative Distribution Function	CDF	Cumulative distribution function. Assumed in this methodology as the Weibull function representing the cumulative likelihood of removals.

Terminology	Acronym	Definition
Data Availability Indicator	DAI	A measure of the amount of condition parameter data that an asset has, as measured against the full data sets that are practically available and included in the HI formula. It is determined by the weighted ratio of the condition parameters availability of an individual unit, over the maximum condition parameters availability of an asset group.
Data Gap		A data gap is the case where none of the units in an asset group has data for a particular item as requested by "ideal" data sets. A data gap means the data is either unavailable or not in a useable format.
De-rating Multiplier	DR	Multipliers used to adjust a condition or sub-condition parameter score or calculated Health Index so as to reflect certain conditions.
Flagged for Action Plan	FFA Plan	Number of units that are expected to require attention annually.
Flagged for Action Year	FFA Year	The year that a particular unit is flagged for action.
Health Index	HI	Health Indexing quantifies equipment condition based on numerous condition parameters that are related to the factors that cumulatively lead to an asset's end of life. HI is given in terms of a percentage range of 0%-100%, with 100% representing as new condition.
Probability Density Function	PDF	Probability density function. Assumed in this methodology as the Weibull function representing the likelihood that an asset will be removed from service when its age is within a particular range.
Removal Rate		Weibull hazard function. Assumed in this methodology as the rate of removal (removals per year for given age, including failures, proactively replaced, removal for non-condition reasons).
Risk		Product of likelihood of removal and consequence of failure.
Sample Size		Subset of an asset population with enough data (i.e. age or condition data) to calculate the HI.

Terminology	Acronym	Definition
Sub-Condition Parameter Score	SCPS	Score of an asset for a particular sub condition parameter. In this study, the scoring system used ranges from 0 through 4 (0 = worst; 4 = best).
Sub-Condition Parameters	CP	Asset characteristics or properties that are used to derive the HI. Each condition parameter can be comprised of multiple sub-condition parameters.
Weibull Distribution		Continuous function used, in this methodology to model, the removal rates of assets.
Weight of Condition Parameter	WCP	In the HI formula, condition parameters are assigned a weight that is based on t he degree of contribution or relevance to asset degradation.
Weight of Sub-Condition Parameter	WSCP	In the HI formula, condition parameters are assigned a weight that is based on t he degree of contribution or relevance to asset degradation.

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I INTRODUCTION

Wellington North Power Inc (WNP) engaged Kinectrics Inc (Kinectrics) in 2020 to perform an Asset Condition Assessment (ACA) on selected distribution assets. An assessment produces a quantifiable evaluation of asset condition and also aids in prioritizing and allocating sustainment investments. This undertaking, if done continuously over time, would allow WNP to monitor trends in the condition of its assets and to continuously improve its assessment process and asset management practices. This assessment covered WNP's asset population as of December 2019. This report presents results based on the available data. Year 0 shown in all figures is for 2020, year 1 for 2021, year 2 for 2022 etc.

I.1 Objective and Scope of Work

The categories and sub-categories of assets considered in this study are as follows:

Asset Category	
MS Transformers	-
MS Switchgear	-
MS Load Switches	-
Pad Mounted Transformers	-
Pole Mounted Transformers	**1-Ph**
	3-Ph
Poles	**4 kV**
	44 kV

I.2 Deliverables

The deliverable in this study is a Report that includes the following information:

- Description of the Asset Condition Assessment methodology
- For each asset category the following were included:
    - Health Index formulation
    - Age distribution
    - Health Index distribution
    - Condition-based Flagged For Action Plan
    - Assessment of data availability and a Data Gap analysis

- Prioritized risk based lists were provided for the asset groups requiring replacement of individual asset units before failure

II ASSET CONDITION ASSESSMENT METHODOLOGY

The Asset Condition Assessment (ACA) Methodology involves the process of determining asset Health Index, as well as developing a condition-based Flagged for Action Plan for each asset group. The methods used are described in the subsequent sections.

II.1 Health Index

Health Indexing quantifies equipment condition based on numerous condition parameters that are related to the degradation factors that lead to an asset's end of service life. The Health Index is an indicator of the asset's overall health and is typically given in terms of percentage, with 100% representing an asset in brand new condition. Health Indexing provides a measure of long-term degradation and thus differs from defect management, whose objective is finding defects and deficiencies that need correction or remediation in order to keep an asset operating prior to reaching its end of life.

Condition parameters are the asset characteristics or properties that are used to derive the Health Index. A condition parameter may be comprised of several sub-condition parameters. For example, a parameter called "Oil Quality" may be a composite of parameters such as "Moisture", "Acid", "Interfacial Tension", "Dielectric Strength" and "Colour".

In formulating a Health Index, condition parameters are ranked, through the assignment of *weights*, based on their contribution to asset degradation. The *condition parameter score* for a particular parameter is a numeric evaluation of an asset with respect to that parameter.

Health Index (HI), which is a function of scores and weightings, is therefore given by:

$$HI = \frac{\sum_{m=1}^{\forall m} \alpha_m (CPS_m \times WCP_m)}{\sum_{m=1}^{\forall m} \alpha_m (CPS_{m.\max} \times WCP_m)} \times DR$$

Equation 0-1

where

$$CPS = \frac{\sum_{n=1}^{\forall n} \beta_n (CPF_n \times WSCP_n)}{\sum_{n=1}^{\forall n} \beta_n (WSCP_n)}$$

Equation 0-2

CPS	Condition Parameter Score
WCP	Weight of Condition Parameter
α_m	Data availability coefficient (1 if available; 0 if not available)
CPF	Sub-Condition Parameter Score
WSCP	Weight of Sub-Condition Parameter
β_n	Data availability coefficient for sub-condition parameter (1 if available; 0 if not available)
DR	De-Rating Multiplier

The scale that is used to determine an asset's score for a particular parameter is called the *condition criteria*. For this project, a condition criteria scoring system of 0 through 4 is used. A score of 0 represents the worst score while 4 represents the best score. I.e. $CPF_{max} = 4$.
De-Rating multipliers are applied to the calculated HI. These may be used to represent the impact of non-condition issues such as design or operating environment.

II.1.1 Health Index Results

As stated previously, an asset's Health Index is given as a percentage, with 100% representing "as new" condition. The Health Index is calculated only if there is sufficient condition data. The subset of the population with sufficient data is called the *sample size*. Results are generally presented in terms of number of units and as a percentage of the sample size. If the sample size is sufficiently large and the units within the sample size are sufficiently random, the results may be extrapolated for the entire population.

The Health Index distribution given for each asset group illustrates the overall condition of the asset group. Further, the results are aggregated into five categories and the categorized distribution for each asset group is given. The Health Index categories are as follows:

Very Poor	Health Index < 25%
Poor	25 ≤ Health Index < 50%
Fair	50 ≤ Health Index <70%
Good	70 ≤ Health Index <85%
Very Good	Health Index ≥ 85%

Note that for critical asset groups, such as Power Transformers, the Health Index of each individual unit is given.

II.2 **Condition Based Flagged for Action Plan**

The condition based Flagged for Action Plan outlines the number of units that are expected to require attention in the next 10 years. The numbers of units are estimated using either a *proactive* or *reactive* approach. In the proactive approach, units are considered for action prior to failure, whereas the reactive approach is based on expected failures per year.

Both approaches consider asset removal rate and probability of failure. The removal rate is estimated using the method described in the subsequent section.

II.2.1 Removal Rate and Probability of Removal

Where removal rate data is not available, a frequency of removal that grows exponentially with age provides a good model.

Depending on its application, there have been various forms derived from the original equation. Based on Kinectrics' experience in removal rate studies of multiple power system asset groups, Kinectrics has selected the Weibull equation to model the removal curves. The Weibull function has no specific characteristic shape and, as such, can model the exponentially increasing removal rate using appropriate parameters.

The Weibull removal density function is defined as:

$$f(t) = \frac{\beta t^{\beta-1}}{\alpha^{\beta}} e^{-(\frac{t}{\alpha})^{\beta}}$$

Equation 0-3

f = removal rate per unit time
t = time
α, β = constant that control the scale and shape of the curve

Depending on its application, there have been various forms derived from the original equation. Based on Kinectrics' experience in removal rate studies of multiple power system asset groups, the following variation of the removal rate formula has been adopted:

The corresponding cumulative removal distribution is therefore:

$$Q(t) = 1 - R(t) = 1 - e^{-(\frac{t}{\alpha})^{\beta}}$$

Equation 0-4

Q(t) = cumulative failure distribution
R(t) = survival function

Finally, the removal rate function (i.e. hazard function) is then:

$$\lambda(t) = \frac{f(t)}{1 - Q(t)} = \frac{\beta t^{\beta-1}}{\alpha^{\beta}}$$

Equation 0-5

$\lambda(t)$ = hazard function (removals per year)

Different asset groups experience different removal rates and therefore different removal distributions. The parameters α and β are determine the shapes of these curves. For each asset group, the values of these constant parameters were selected to reflect typical useful lives for these assets.

Consider, for example, an asset class where at the ages of 40 and 75 the asset has cumulative probabilities of removal of 20% and 95% respectively. It follows that when using Equation 5, α and β are calculated as 57.503 and 4.132 respectively. The removal rate and probability of removal graphs for these parameters are as follows:

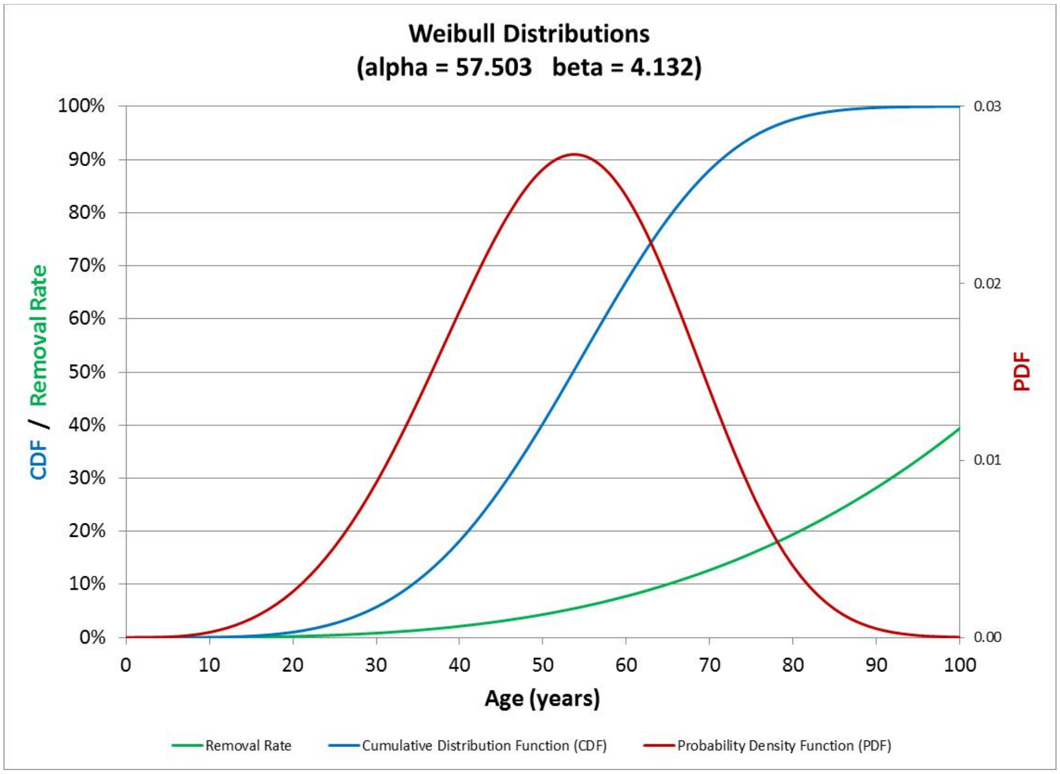

Figure 1 Removal rate vs. Age

II.2.2 Projected Flagged for Action Plan Using a Probabilistic Approach

For assets that have low consequences of failure or that are run to failure, a probabilistic approach is taken to estimate the number of units that are flagged for action in a given year.

For such asset types, the number of units expected to be replaced in a given year are determined based on the asset's removal rates. The number of failures per year is given by Equation 0-5.

An example of such a Flagged for Action Plan is as follows: Consider an asset distribution of 100 - 5 year old units, 20 – 10 year old units, and 50 - 20 year old units. Assume that the removal rates for 5, 10, and 20 year old units for this asset class are $\lambda_5 = 0.02$, $\lambda_{10} = 0.05$, $\lambda_{20} = 0.1$ failures / year respectively. In the current year, the total number of replacements is 100(.02) + 20(0.05) + 50(0.1) = 2 + 1 + 5 = 8.

In the following year, the expected asset distribution is, as a result, as follows: 8 – 1 year old units, 98 – 6 year old units, 19 – 11 year old units, and 45 - 21 year old units. The number of replacements in year 2 is therefore $8(\lambda_1) + 19(\lambda_6) + 45(\lambda_{11}) + 45(\lambda_{21})$.

Note that in this study the "age" used is in fact "effective age", or condition-based age if available, as opposed to the chronological age of the asset.

For the asset categories below, the probabilistic approach is used to estimate the FFA Plan. It is also important to note that the FFA gives the estimated number of assets per year that need to be addressed; the year that a specific unit needs to be addressed is not calculated.

- Voltage regulators
- Capacitors
- OH line switches
- OH line reclosers
- Distribution transformers (pole mounted, pad mounted, vault, submersible)
- Poles (wood, concrete, steel)
- Pad mounted switchgear
- Primary underground cables

II.2.3 Projected Flagged for Action Plan Using a Prioritized Risk Approach

For certain asset classes, costs of replacement and/or consequences of failure are more significant. As such planning for replacement requires more consideration. For these assets, a risk-based approach is taken when developing the FFA Plan. This risk-based methodology considers both the asset likelihood of removal (as related to HI) and its consequence of failure (criticality). The product of likelihood or removal and consequence of failure determines asset risk.

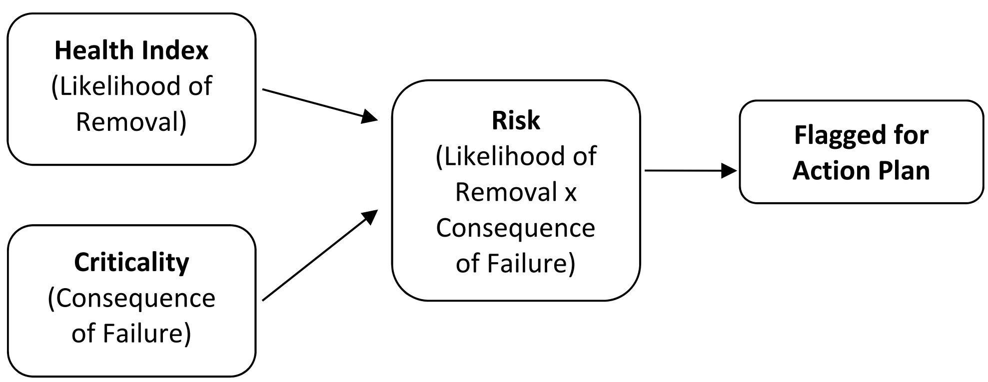

Figure 2 Risk Assessment Procedure

Relating Health Index and Probability of Removal

If there are no dominant sources, it can be assumed that the stress to which an asset is exposed is not constant and will have a somewhat normal frequency distribution. This is illustrated by the probability density curve of stress below. The vertical lines in the figure represent condition or strength (Health Index) of an asset.

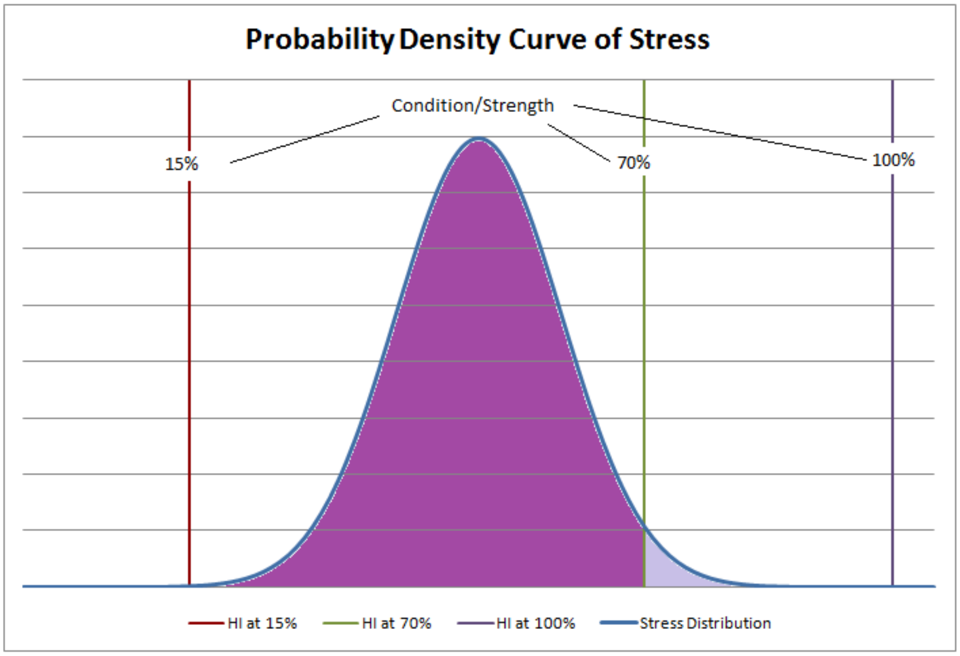

Figure 3 Stress Curve

An asset is in as-new condition (100% strength) should be able to withstand most levels of stress. As the condition of the asset deteriorates, it may be less able to withstand higher levels of stress. Consider, for example, the green vertical line that represents 70% condition/strength. The asset should be able to withstand magnitudes of stress to left of the green line. If, however, the stress is of a magnitude to the right of the green line, the asset will fail.

To create a relationship between the Health Index and likelihood of removal, assume two "points" on the stress curve that correspond to two different Health Index values. In this example, assume that an asset that has a condition/strength (Health Index) of 100% can withstand all magnitudes of stress to the left of the purple line. It then follows that probability that an asset in 100% condition will fail is the probability that the magnitude of stress is at levels to the right of the purple line. This corresponds to the area under the stress density curve to the right of the purple line. Similarly, if it assumed that an asset with a condition of 15% will fail if subjected to stress at magnitudes to the right of the red line, the probability of failure at 15% condition is the area under the stress density curve to the right of the red line.

The likelihood of removal at a particular Health Index is found from plotting the Health Index on X-axis and the area under the probability density curve to the right of the Health Index line on Y-axis, as shown on the graph of the figure below.

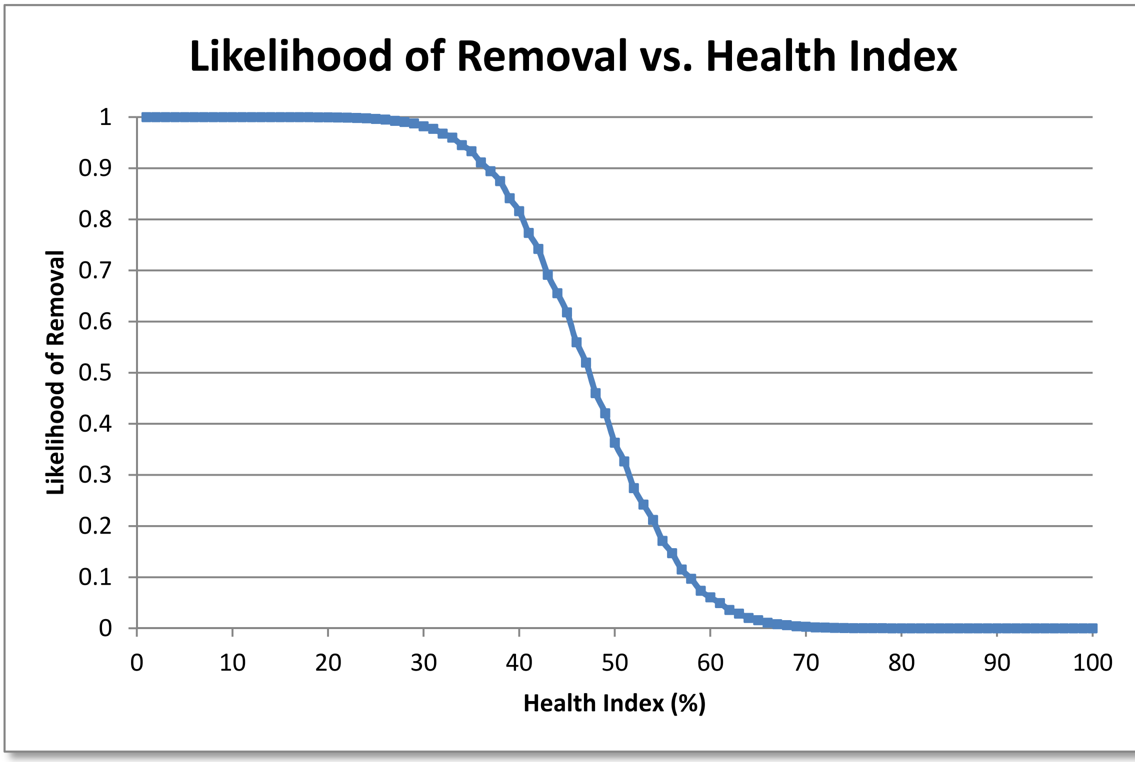

Figure 4 Likelihood of Removal vs. Health Index

Condition-Based Flagged for Action Plan

In this study, the metric used to measure consequence of failure is referred to as *Criticality*. Criticality may be determined in numerous ways, with monetary consequence or degree of risk to corporate business values being examples. The higher the criticality value assigned to a unit, the higher it's consequence of failure.

Due to the small population size for the asset groups applicable to prioritized risk based approach, in this study all the units in these asset groups were assigned of minimum criticality value.

To develop a Flagged for Action Plan, the risk of removal of each unit must be quantified. Risk is the product of a unit's likelihood of removal and its consequence of failure. An asset unit is flagged for action when the calculated risk value exceeds a pre-set threshold.

For the asset categories listed below, the risk-based approach is used to estimate the FFA Plan.

- Station transformers (main tank + LTC)
- Station circuit breakers

It is also important to note with this approach, in addition to the estimated number of assets per year that need to be addressed, the FFA Year (i.e. the years that a particular unit is flagged for action) is calculated for each asset unit.

II.3 Data Assessment

The condition data used in this study included the following:

- Test Results (e.g. Oil Quality, DGA)
- Inspection Records
- Loading
- Make, Model, and Type
- Age

There are two components that assess the availability and quality of data used in this study: data availability indicator (DAI) and data gap.

II.3.1 Data Availability Indicator (DAI)

The Data Availability Indicator (DAI) is a measure of the amount of condition parameter data that an asset has, as measured against the full data sets that are practically available and included in the HI formula. It is determined by the weighted ratio of the condition parameters availability of an individual unit, over the maximum condition parameters availability of an asset group. The formula is given by:

$$DAI = \frac{\sum_{m=1}^{\forall m} (DAI_{CPS\,m} \times WCP_m)}{\sum_{m=1}^{\forall m} (WCP_m)}$$

Equation 6

where

$$DAI_{CPSm} = \frac{\sum_{n=1}^{\forall n} \beta_n \times WCFn}{\sum_{n=1}^{\forall n} (WCPFn)}$$

Equation 7

DAI_{CPSm}	Data Availability Indicator for Condition Parameter m with n Condition Parameter Factors (CPF)
β_n	Data availability coefficient for sub-condition parameter (=1 when data available, =0 when data unavailable)
$WSCP_n$	Weight of Condition Parameter Factor n
DAI	Overall Data Availability Indicator for the m Condition Parameters
WCP_m	Weight of Condition Parameter m

For example, consider an asset with the following condition parameters and sub-condition parameters:

Condition Parameter		Condition Parameter Weight (WCP)	Sub-Condition Parameter		Sub-Condition Parameter Weight (WCF)	Data Available? (β = 1 if available; 0 if not)
m	Name		n	Name		
1	A	1	1	A_1	1	1
2	B	2	1	B_1	2	1
			2	B_2	4	1
			3	B_3	5	0
3	C	3	1	C_1	1	0

The Data Availability Indicator is calculated as follows:

$DAI_{CP1} = (1*1) / (1) = 1$
$DAI_{CP2} = (1*2 + 1*4 + 0*5) / (2 + 4 + 5) = 0.545$
$DAI_{CP3} = (0*1) / (1) = 0$

$$DAI = (DAI_{CP1}*WCP_1 + DAI_{CP2}*WCP_2 + DAI_{CP3}*WCP_3) / (WCP_1 + WCP_2 + WCP_3)$$
$$= (1*1 + 0.545*2 + 0*3) / (1 + 2 + 3)$$
$$= 35\%$$

An asset with all available condition parameter data represented will, by definition, have a DAI value of 100%. In this case, an asset will have a DAI of 100% regardless of its Health Index score. Bear in mind that a DAI of 100% does not mean there is no data gap (to be discussed in the following section). What it really indicates is that, at the time of study, an asset has information on all the condition parameters that a utility is able to provide information for.

Provided that the condition parameters used in the Health Index formula are of good quality and there are little data gaps, there will be a high degree of confidence that the Health Index score accurately reflects the asset's condition.

II.3.2 Data Gap

The Health Index formulations developed and used in this study are based only on WNP's available data. There are additional parameters or tests that WNP may not collect but that are important indicators of the deterioration and degradation of assets. While these will not be included in the HI formula, they are referred to as data gaps. I.e. A data gap is the case where none of the units in an asset group has data for a particular item as requested by "ideal" data sets. The situation where data is provided for only a sub-set of the population is not considered as a data gap.

As part of this study, the data gaps of each asset category are identified. In addition, the data items are ranked in terms of importance. There are three priority levels, the highest being most indicative of asset degradation.

Priority	Description	Symbol
High	Impactive data; most useful as an indicator of asset degradation	☆☆☆
Medium	Important data; can indicate the need for corrective maintenance or increased monitoring	☆☆
Low	Helpful data; least indicative of asset deterioration	☆

When filling up data gaps, it is generally recommended that data collection be initiated for the items marked with higher priority, because such information will result in higher quality Health Index formulas.

The more impactive and important data included in the Health Index formula of a certain asset group, and the higher the Data Availability Indicator of a particular unit in that group, the higher the confidence in the Health Index calculated for the particular unit.

If an asset group has significant data gaps and lacks good quality condition, there is less confidence that the Health Index score of a particular unit accurately reflects its condition, regardless of the value of its DAI.

To facilitate the incorporation of data gap items into improved Health Index formulas for future assessments, the data gaps items are presented in this report as sub-condition parameters. For each item, the parent condition parameter is identified. Also given are the object or component addressed by the parameter, a description of what to assess for each component or object, and the possible source of data.

The following is an example for "Tank Corrosion" on a Pad-Mounted Transformer:

Data Gap (Sub-Condition Parameter)	**Parent Condition Parameter**	**Priority**	**Object or Component Addressed**	**Description**	**Source of Data**
Tank Corrosion	Physical Condition	☆☆	Oil Tank	Tank surface rust or deterioration due to environmental factors	Visual Inspection

III RESULTS

This section summarizes the findings of this study.

III.1 Health Index Results

A summary of the Health Index evaluation results is shown in Table 1. For each asset category the population, sample size (number of assets with sufficient data for Health Indexing), average age, age availability and average DAI are given. The average Health Index and distribution are also shown. A summary of the Health Index distribution for all asset categories are also graphically shown in Figure 5. Note that the Health Index distribution percentages are based on the asset group's sample size.

It can be observed that out of the 8 sub-categories, 6 of them had over 80% of their units classified as "good" or "very good", and 3 of them had an average Health Index score of greater than 80%.

It can be seen from the results that among all the asset categories, Pole Mounted Transformers (1-Ph) were relatively speaking the one of concern. About 15% of the units in these asset groups were classified as "poor" or "very poor", with an average Health Index score below 70%.

Both MS Switchgear and MS Load Switches had 17% of their units classified as "Poor" or "Very Poor". Given the fact that there were in total only 6 units in each of these 2 groups, this represented only 1 unit respectively.

Table 1 Health Index Results Summary

Asset Category		Population	Sample Size	Average Health Index	Health Index Distribution: Very Poor (< 25%)	Poor (25 - <50%)	Fair (50 - <70%)	Good (70 - <85%)	Very Good (>= 85%)	Average Age	Average DAI	Age Availability
MS Transformers		6	6	87%	0	0	1	0	5	22	87%	100%
MS Switchgear		6	6	74%	0	1	0	3	2	25	96%	83%
MS Load Switches		6	6	76%	0	1	0	3	2	25	96%	100%
Pad Mounted Transformers		145	145	78%	8	2	13	20	102	23	61%	100%
Pole Mounted Transformers	1-Ph	458	458	68%	33	36	90	168	131	25	59%	100%
	3-Ph	64	64	74%	6	2	9	5	42	18	61%	100%
Poles	4 kV	1581	1581	84%	7	19	129	612	814	23	90%	100%
	44 kV	309	309	86%	0	0	7	131	171	18	94%	100%

0% 100%

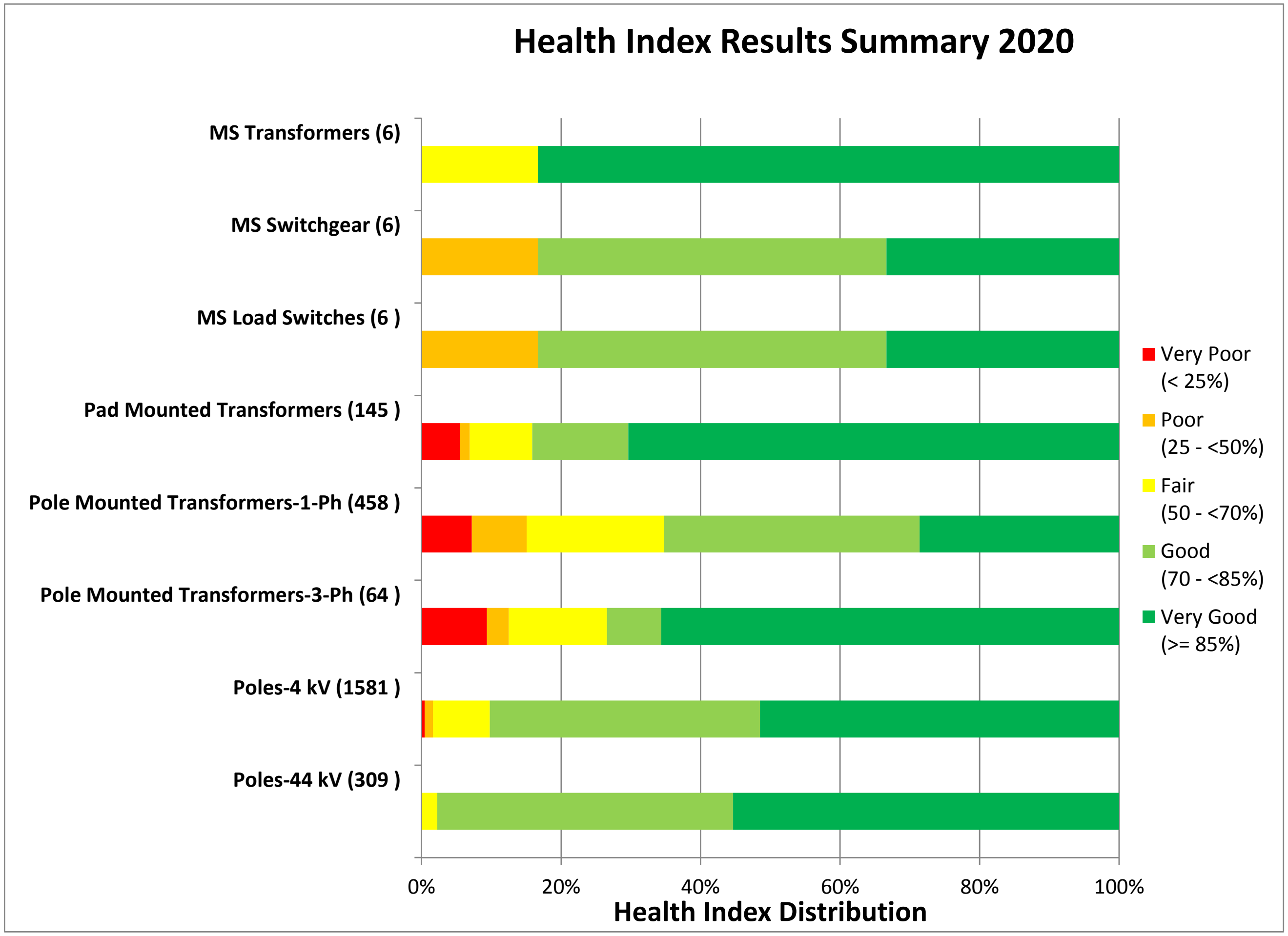

Figure 5 Health Index Results Summary

III.2 Condition-Based Flagged for Action Plan

The Flagged for Action Plan estimates the number of units expected to require attention in a given year.

Table 2 shows the Year 0 (year 2020) and 10 Year cumulative Flagged for Action Plan. Table 3 shows the 10 Year Flagged for Action Plan annually.

Table 2 Summary of Flagged for Action

Asset Category		1st Year Action		10 Year Action in Total		Replacement Strategy
		Quantity	Percentage	Quantity	Percentage	
MS Transformers		0	0.0%	0	0.0%	Proactive
MS Switchgear		1	16.7%	1	16.7%	Proactive
MS Load Switches		1	16.7%	1	16.7%	Proactive
Pad Mounted Transformers		6	4.1%	56	38.6%	Proactive
Pole Mounted Transformers	1-Ph	17	3.7%	146	31.9%	Reactive
	3-Ph	2	3.1%	20	31.3%	Reactive
Poles	4 kV	40	2.5%	422	26.7%	Reactive
	44 kV	7	2.3%	80	25.9%	Reactive

100% 0%

Table 3 Ten Year Flagged for Action Plan

Asset Category		Flagged for Action Plan by Year										
		0	1	2	3	4	5	6	7	8	9	10
MS Transformers		0	0	0	0	0	0	0	0	0	0	0
MS Switchgear		1	0	0	0	0	0	0	0	0	0	0
MS Load Switches		1	0	0	0	0	0	0	0	0	0	0
Pad Mounted Transformers		6	5	5	5	5	6	6	6	6	6	6
Pole Mounted Transformers	**1-Ph**	17	14	15	15	15	14	14	14	14	14	14
	3-Ph	2	2	2	2	2	2	2	2	2	2	2
Poles	**4 kV**	40	35	38	39	41	43	45	46	47	48	49
	44 kV	7	6	7	7	8	8	9	9	9	10	10

* Year 0 = 2020, year 1 = 2021, year 2 = 2022 … etc

It is evident from Table 3 that in general, all the asset groups outside substations had smooth flagged for action plans, indicating relatively small variation or gradual ascending/descending trend, in terms of yearly flagged for action numbers.

The asset categories inside stations showed immediate flagged for action for 1 unit of MS Switchgear and MS Load Switch each, but no flagged for action units in the next 10 years.

It is important to note that the Flagged for Action plan suggested in this study is based solely on asset condition. It uses a probabilistic, non-deterministic, approach and as such can only show expected failures or probable number of units that are expected to be candidates for replacement or other action. While this condition-based Flagged for Action Plan can be used as a guide or input to WNP's distribution system plan, it is not expected that it be followed directly or as the final deciding factor in making sustainment capital decisions. There are numerous other factors and considerations that will influence WNP's Asset Management decisions, such as obsolescence, system expansion, regulatory requirements, municipal demand and customer preferences etc.

III.3 Data Assessment Results

Data assessment determines the data availability of each asset group, as well as identifying the data gaps for each asset group. Data availability is a measure of the amount of data that an individual unit has in comparison with the set of data currently available in for its respective asset category. Data gaps are items that are indicators of asset degradation, but are currently not collected or available for any asset in an asset category. The fewer the data gaps, the higher the quality of available condition data and Health Index formulas.

Data for MS Transformers included age, recent loading, oil and insulation test results, and inspection records. There were no major data gaps other than historic removal records.

Data for MS Switchgear and MS Load Switches included age, insulation and contact resistance test results, and inspection records. There were no major data gaps other than historic removal records.

Data for Pad Mounted and Pole Transformers included age, overall inspection results and infrared test results. Major data gaps were individual inspection results, transformer loading and historic removal records.

Data for Poles included age, inspection results and strength test results. There were no major data gaps other than historic removal records.

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IV CONCLUSIONS

An Asset Condition Assessment was conducted for six of WNP's distribution asset categories (eight sub-categories). For each asset category, the Health Index distribution was determined and a condition-based Flagged for Action plan was developed.

Risk based prioritized lists were developed for MS Transformers, MS Switchgear and MS Load Switches. These lists indicated the projected flagged for action year of each individual unit.

The following conclusions were drawn based on the ACA findings of this study.

1) In general, 6 out 8 WNP's asset sub-categories had over 80% of their asset units in good condition ("good" or "very good"), with 3 out of 8 sub-categories having an average Health Index score of greater than 80%.

2) With respect to the asset groups that were of concern, Pole Mounted Transformers (1-Ph) were found to be in the relatively speaking inferior condition, with an average Helath Index below 70%.

3) In terms of flagged-for-action plans, no asset group had high backlog of units to be addressed immediately.

4) For 10-year long term flagged-for-action plans, Pad Mounted Transformers and Pole Mounted Transformers (both 1-Ph and 3-Ph) had over 30% of the population to be addressed.

5) It is important to note that the Flagged for Action plan presented in this study is based solely on asset condition and that there are numerous other considerations that may influence WNP's Asset Management Plan, such as obsolescence, system growth, regulatory requirements, municipal initiatives, etc.

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V RECOMMENDATIONS

The following recommendations were made based on the study results:

a) In the future, historic records of asset removal need to be collected for all the asset groups, so as to improve the accuracy of asset degaradtion curves.

b) Inspection records at component level need to be collected for Pad Mounted Transformers and Pole Mounted Transformers, so as to improve the input granularity for better assessment of component condition status.

c) Manufacturer Specification limits for contact resistance and operation cycles need to be collected for MS Switchgear and MS Load Switches, so as to set up the thresholds for assessing switch usage.

d) Inspection and test data for the individual unts under the same asset group need to be merged under one data file for each asset group, in a form that is electronically extractable. This applies to the asset groups inside stations.

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VI APPENDIX A: RESULTS FOR EACH ASSET CATEGORY

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1 MS TRANSFORMERS

1.1 Health Index Formula

Assume a parameter scoring system of 0 through 4, where 0 and 4 represent the "worst" and "best" scores respectively. Thus, the maximum score for any condition or sub-condition parameter (maximum CPS and CPF) is "4".

1.1.1 Condition and Sub-Condition Parameters

Table 1-1 Condition Parameter and Weights – MS Transformers

m	Condition Parameter	WCP_m	Sub-Condition Parameters
1	Internals	5	Table 1-2
2	Insulation	4	Table 1-3
3	Windings	3	Table 1-4
4	Paper	4	Table 1-5
5	Service Record	5	Table 1-6
	Age Limiting	Overall Multiplier	Figure 1-1

Table 1-2 Internals Sub-Condition Parameters and Weights (m=1) – MS Transformers

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	H2	5	Table 1-7
2	CH4	3	Table 1-7
3	C2H6	3	Table 1-7
4	C2H4	3	Table 1-7
5	C2H2	5	Table 1-7

Table 1-3 Insulation Oil Sub-Condition Parameters and Weights (m=2) – MS Transformers

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Dissipation Factor	2	Table 1-8
2	Moisture	4	Table 1-8
3	Dielectric Strength	5	Table 1-8
4	IFT	3	Table 1-8
5	Acid Number	2	Table 1-8

Table 1-4 Windings Sub-Condition Parameters and Weights (m=3) – MS Transformers

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	TTR	1	Equation 1-1
2	Excitation Current	1	Equation 1-2
3	Winding Resistance	1	Equation 1-3

Table 1-5 Paper Sub-Condition Parameters and Weights (m=4) – MS Transformers

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Power Factor	5	Table 1-9
2	Insulation Resistance	1	Equation 1-4
3	DGA CO	2	Table 1-7

Table 1-6 Service Record Sub-Condition Parameters and Weights (m=5) – MS Transformers

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Loading	1	Table 1-10

1.1.2 Condition Criteria

<u>Oil DGA – Transformer Oil</u>

Table 1-7 DGA Criteria - Transformers

	Dissolved Gas	Scores					
		4	**3.2**	**2.4**	**1.6**	**0.8**	**0**
2.5 MVA to 10 MVA	**H2 (Hydrogen)**	X ≤ 70	70 < X ≤ 100	100 < X ≤ 200	200 < X ≤ 400	400 < X ≤ 1000	X >1000
	CH4 (Methane)	X ≤ 70	70 < X ≤ 120	120 < X ≤ 200	200 < X ≤ 400	400 < X ≤ 600	X > 600
	C2H6 (Ethane)	X ≤ 75	75 < X ≤ 100	100 < X ≤ 150	150 < X ≤ 250	250 < X ≤ 500	X > 500
	C2H4 (Ethylene)	X ≤ 60	60 < X ≤ 100	100 < X ≤ 150	150 < X ≤ 250	250 < X ≤ 500	X > 500
	C2H2 (Acetylene)	X ≤ 3	3 < X ≤ 7	7 < X ≤ 35	35 < X ≤ 50	50 < X ≤ 100	X > 100
	CO (Carbon Monoxide)	X ≤ 750	750 < X ≤ 1000	1000 < X ≤ 1300	1300 < X ≤ 1500	1500 < X ≤ 1700	X > 1700
	CO2 (Carbon Dioxide)	X ≤ 7500	7500 < X ≤ 8500	8500 < X ≤ 9000	9000 < X ≤ 12000	12000 < X ≤ 15000	X > 15000
> 10 MVA	**H2 (Hydrogen)**	X ≤40	40 < X ≤ 100	100 < X ≤ 300	300 < X ≤ 500	500 < X ≤ 1000	X >1000
	CH4 (Methane)	X ≤ 80	80 < X ≤ 150	150 < X ≤ 200	200 < X ≤ 500	500 < X ≤ 700	X > 700
	C2H6 (Ethane)	X ≤ 70	70 < X ≤ 100	100 < X ≤ 150	150 < X ≤ 250	250 < X ≤ 500	X > 500
	C2H4 (Ethylene)	X ≤ 60	60 < X ≤ 100	100 < X ≤ 150	150 < X ≤ 250	250 < X ≤ 500	X > 500
	C2H2 (Acetylene)	X ≤ 3	3 < X ≤ 7	7 < X ≤ 35	35 < X ≤ 50	50 < X ≤ 80	X > 80
	CO (Carbon Monoxide)	X ≤ 350	350 < X ≤ 500	500 < X ≤ 600	600 < X ≤ 1000	1000 < X ≤ 1500	X > 1500
	CO2 (Carbon Dioxide)	X ≤ 3000	3000 < X ≤ 4500	4500 < X ≤ 5700	5700 < X ≤ 7500	7500 < X ≤ 10000	X > 10000

General Oil Quality

Table 1-8 Oil Quality Test Criteria

Oil Quality Test		Voltage Class [kV]	Score				
			4	3	2	1	0
Water Content (D1533) [ppm]	Main Tank	V ≤ 69	< 30	30-33.3	33.3-36.6	36.6-40	> 40
		69 < V < 230	< 20	20-25	25-30	30-35	> 35
		V ≥ 230	< 15	15-18.3	18.3-21.6	20-25	> 25
	Tap	V ≤ 69	< 30	30-33.3	33.3-36.6	36.6-40	> 40
		V > 69	< 20	20-25	25-30	30-35	> 35
Dielectric Strength (D1816 – 1mm gap) [kV]	Main Tank	V ≤ 69	> 20	20-17.5	12.5-17.5	10-12.5	< 10
		69 < V < 230	> 25	21-25	17-21	13-17	< 13
		V ≥ 230	> 27	23-27	20-23	17-20	< 17
	Tap	V ≤ 69	> 25	21.6-25	18.3-21.6	15-18.3	< 15
		V > 69	> 30	26-30	22-26	18-22	< 18
Dielectric Strength (D877) [kV]	Main Tank	All	> 40	33.3-40	22.6-33.3	20-22.6	< 20
	Tap	All	> 25	21.6-25	18.3-21.6	15-18.3	< 15
IFT (D971) [dynes/cm]	Main Tank	V ≤ 69	> 25	21.6-25	18.3-21.6	15-18.3	< 15
		69 < V < 230	> 30	26-30	22-26	18-22	< 18
		V ≥ 230	> 32	28-32	24-28	20-24	< 20
	Tap	All	> 25	21.6-25	18.3-21.6	15-18.3	< 15
Color	Main Tank	All	< 1.5	1.5-1.8	1.8-2.1	2.1-2.5	> 2.5
	Tap	All	< 2.0	2.0-2.3	2.3-2.6	2.6-3.0	> 3.0
Acid Number (D974) [mg KOH/g]	Main Tank	V ≤ 69	< 0.05	0.05-0.1	0.1-0.15	0.15-0.2	> 0.2
		69 < V < 230	< 0.04	0.04-0.077	0.077-0.113	0.113-0.15	> 0.15
		V ≥ 230	< 0.03	0.03-0.053	0.053-0.076	0.076-0.1	> 0.1
	Tap	All	< 0.05	0.05-0.1	0.1-0.15	0.15-0.2	> 0.2
Dissipation Factor (D924 - 25C)	Main Tank and Tap	All	< 0.5%	0.5%-1%	1-1.5%	1.5-2%	> 2%
Dissipation Factor (D924 - 100C)		All	< 5%	5%-10%	10%-15%	15%-20%	> 20%

Transformer Turns Ratio (TTR)

The “turns ratio” parameter compares the measured TTR to the expected (calculated) value.

If Maximum TTR varies from the calculated value by more than 0.5%
Then **Score** = 0

Else **Score** = 4

Equation 1-1

Excitation Current

There will be two high readings ($\text{Reading}_{\text{High1}}$ and $\text{Reading}_{\text{High2}}$) and one low reading ($\text{Reading}_{\text{low}}$). Evaluation is done by comparing the two similar high readings.

Score = Max(Score_i, Score_2, …, Score_t)

Where
Score_t are scores for different tap positions and

And
If $\text{Reading}_{\text{High1}}$ or $\text{Reading}_{\text{High2}}$ > 50 mA
If Variation between $\text{Reading}_{\text{High1}}$ and $\text{Reading}_{\text{High2}}$ > 10%
$\textbf{Score}_{\textbf{tap}}$ = 0
Else $\textbf{Score}_{\textbf{tap}}$ = 4

Else
If Variation between $\text{Reading}_{\text{High1}}$ and $\text{Reading}_{\text{High2}}$ > 5%
$\textbf{Score}_{\textbf{tap}}$ = 0
Else $\textbf{Score}_{\textbf{tap}}$ = 4
End if

Equation 1-2

Winding Resistance

The “winding resistance” parameter compares the winding resistance variation between phases in all tap positions.

If Maximum winding resistance variation between three phases across any tap position (LV or HV) is greater than 5% *Then* **Score** = 0

Else **Score** = 4

Equation 1-3

Insulation Resistancet

The “insulation resistance” parameter has 3 readings for insulation resistance from individual windings to ground and between individual windings.

If Minimum insulation resistance $< 1.5 \times \frac{Transformer\ Primary\ Line\ Voltage}{\sqrt{Transformer\ Capacity}}$, *Then* **Score** = 0

Else **Score** = 4

Equation 1-4

Power Factor Test

Table 1-9 Power Factor Test Criteria

Score	Description
4	PF < 0.05%
3	0.05% < PF < 0.5%
2	0.5% < PF < 1%
1	1% < PF < 2%
0	PF >2%

Loading History

Table 1-10 Loading History - MS Transformers

Data: S1, S2, S3, …, SN recorded data (average daily loading)
SB= rated MVA NA=Number of Si/SB which is lower than 0.6 NB= Number of Si/SB which is between 0.6 and 0.8 NC= Number of Si/SB which is between 0.8 and 1.0 ND= Number of Si/SB which is between 1 and 1.2 NE= Number of Si/SB which is greater than 1.2 Score = $\frac{NA \times 4 + NB \times 3 + NC \times 2 + ND \times 1}{N}$

Age Limiting Factor

In this project, age was used as a limiting factor to reflect the degradation of asset unit as time passed by.

The calculated overall HI result (after taking into account all the possible de-rating multipliers) is then compared with an age limiting factor.

$$Final\ overall\ HI = \begin{cases} HI_{calculated} & if\ HI_{calculated} <= Age\_Limiter \\ Age\_limiter & if\ HI_{calculated} > Age\_Limiter \end{cases}$$

The age derating is the Weibull survival function (1 – cumulative distribution function), assuming it could be modeled by the Weibull distribution.

$$Age\_Derating = S_f = e^{-(\frac{x}{\alpha})^{\beta}}$$

Equation 1-5

S_f = survivor function
x = age in years
α = *constant that controls scale of function*
β = *constant that controls shape of function*

In this project, the parameters of MS Transformers age limiting curve are shown in the following table, based on WNP expert feedback.

Table 1-11 Age Limiting Curve Parameters - MS Transformers

Asset Type	α	β
MS Transformers	**60.7246**	**7.7187**

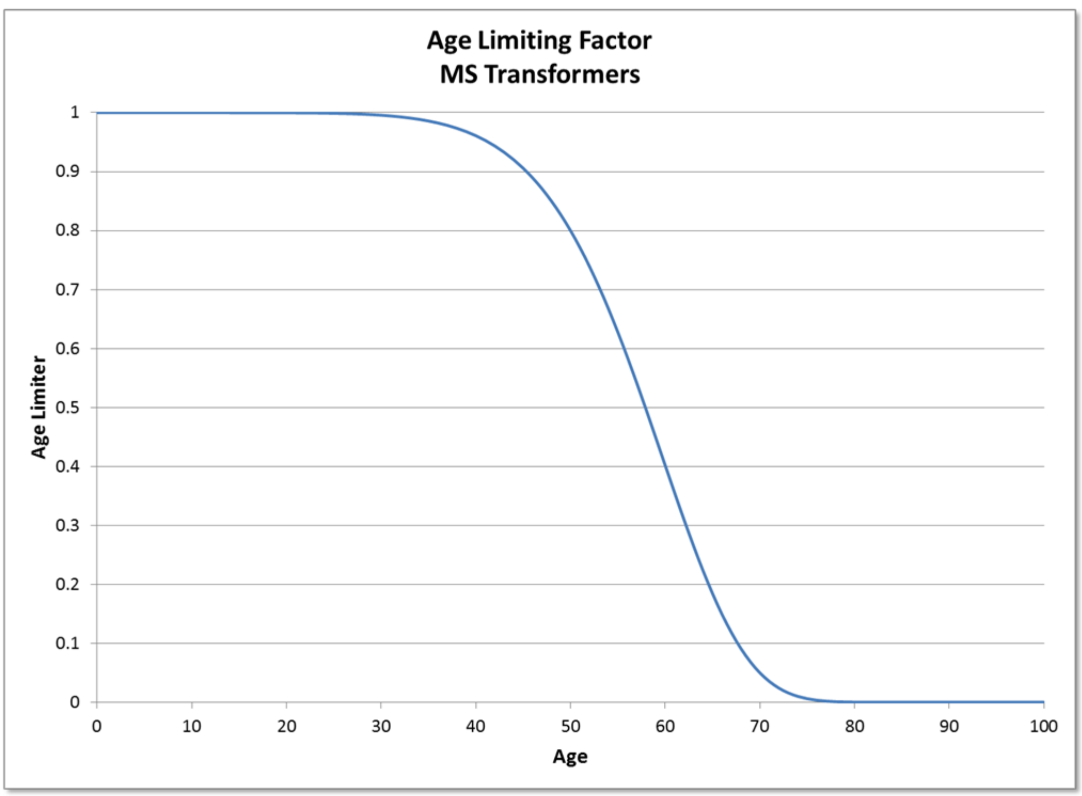

Figure 1-1 Age Limiting Factor Criteria - - MS Transformers

1.2 Age Distribution

The average age was 22 for MS Transformers. The age distribution was as follows.

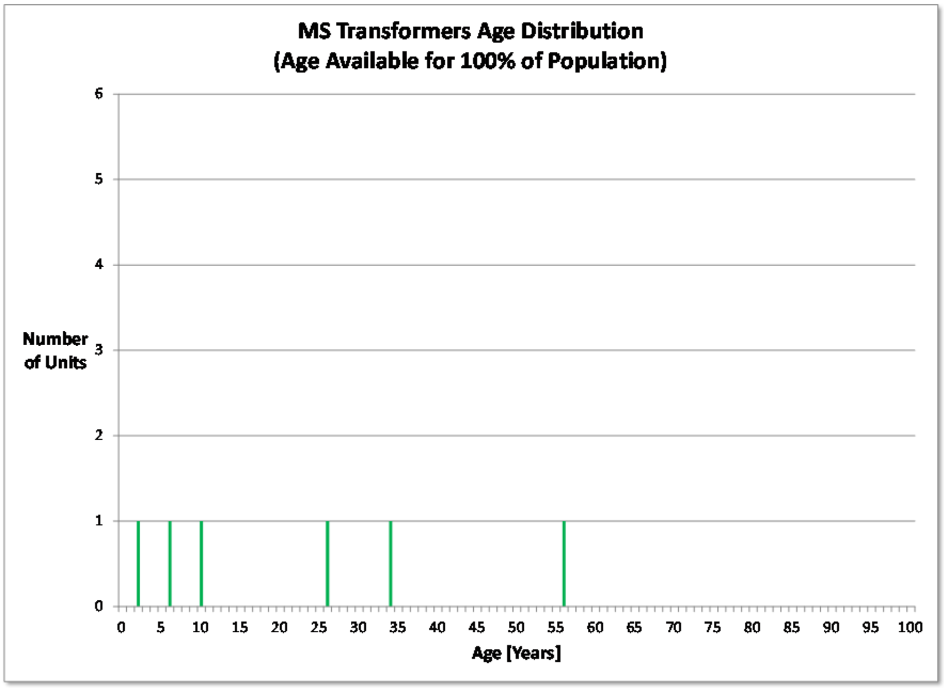

Figure 1-2 Age Distribution –MS Transformers

1.3 Health Index Results

There were 6 units of MS Transformers. All of them had sufficient data for a Health Indexing.

The average Health Index was 87%.

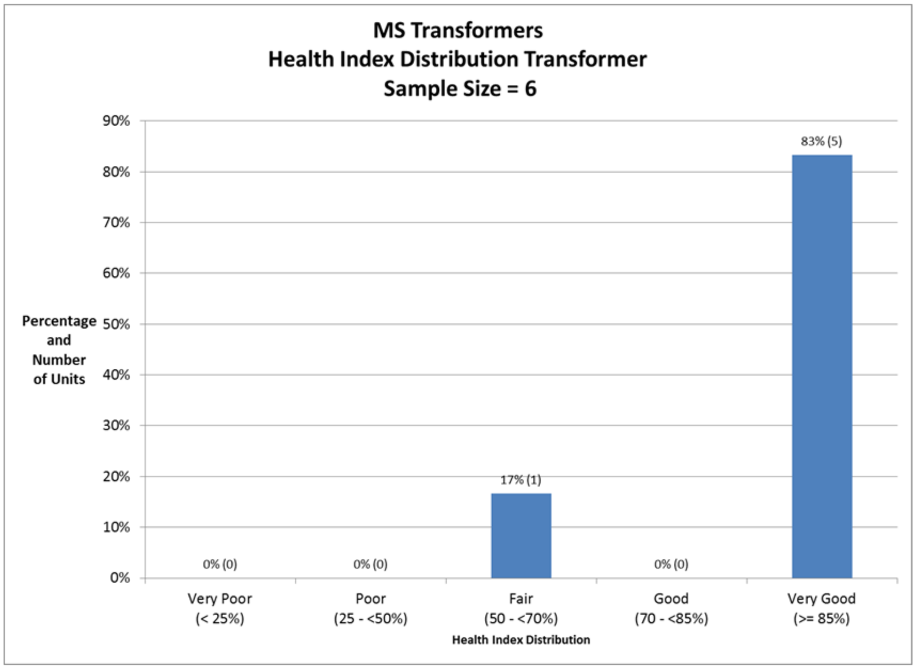

Figure 1-3 Health Index Distribution –MS Transformers

1.4 Flagged for Action Plan

As it is assumed that MS Transformers are proactively replaced, the risk assessment and flag-for-action plan procedure described in Section II.2.3 was applied for this asset class.

As noted in Section II, a unit becomes a candidate for replacement when its risk, product of its *probability of failure* and *criticality*, is greater than or equal to a pre-set minimum risk value. The probability of failure is as determined by the Health Index. Criticality is determined as shown in the following section. The minimum risk value in this study is defined as 1.25*95% = 1.1875.

The minimum criticality, $Criticality_{min}$, is 1.25. This value is selected such that a unit with a probability of failure of 80% becomes a candidate for replacement (i.e. 80% * 1.25 = 1). The maximum criticality, $Criticality_{max}$, is twice the base criticality ($Criticality_{max}$ = 1.25*2 = 2.5).

Each unit's criticality is defined as follows:

$$Criticality = (Criticality_{max} - Criticality_{min}) * Criticality\_Multiple + Criticality_{min}$$

As in this study, all the 6 units of MS Transformers were assumed to be of equal importance, the criticality multiple in the above equation is assigned to be zero.

The flagged for action plan shows that no unit is flagged for action in the next 10 years.

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1.5 Risk Based Prioritized List

The following table shows the risk based prioritization lists.

Table 1-12 Risk Based Prioritization List - MS Transformers

Rank	ID	Substation	Position	kVA	Age	DAI	HI by condition	HI	Risk Index 100% = Most Risk 0% = Least Risk	FFA Year
1	MS-4	4	43759	2000	56	100%	93%	59%	29.0%	>20
2	MS-6	6	43759	5000	10	48%	88%	88%	0.3%	>20
3	MS-5	5	43759	5000	26	100%	89%	89%	0.2%	>20
4	MS-2	2	43759	5000	6	100%	92%	92%	0.1%	>20
5	MS-1	1	43759	5000	34	100%	96%	96%	0.0%	>20
6	MS-3	3	43759	5000	2	71%	97%	97%	0.0%	>20

1.6 Data Gaps

Data for MS Transformers included age, loading, oil and various transformer test results. The following table shows the data gaps.

Table 1-13 Data Gap for MS Transformers

Data Gap (Sub-Condition Parameter)	Parent Condition Parameter	Priority	Description	Source of Data
Historic Removal Record		☆☆☆	Age at removal	Inventory Database

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2 MS SWITCHGEAR

2.1 Health Index Formula

Assume a parameter scoring system of 0 through 4, where 0 and 4 represent the "worst" and "best" scores respectively. Thus, the maximum score for any condition or sub-condition parameter (maximum CPS and CPF) is "4".

2.1.1 Condition and Sub-Condition Parameters

Table 2-1 Condition Parameter and Weights – MS Switchgear

m	Condition Parameter	WCP_m	Sub-Condition Parameters
1	Bus and Cable	2	Table 2-2
2	LV Compartment	1	Table 2-3
3	Cubicle	1	Table 2-4
4	Switch	4	Table 2-5
5	Service Record	2	Table 2-6
	Age Limiting		Figure 2-1

Table 2-2 Bus and Cable Sub-Condition Parameters and Weights (m=1) – MS Switchgear

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Cable Termination	2	Table 2-7
2	Insulator-Barrier	3	Table 2-7 Equation 2-3
3	CT-PT	3	Table 2-7
4	Grounding	1	Table 2-7

Table 2-3 LV Compartment Sub-Condition Parameters and Weights (m=2) – MS Switchgear

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Protection	3	Table 2-7
2	Metering	2	Table 2-7

Table 2-4 Cubicle Sub-Condition Parameters and Weights (m=3) – MS Switchgear

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Physical Condition	1	Table 2-7
2	Mechanical Interlocks	2	Table 2-7

Table 2-5 Switch Sub-Condition Parameters and Weights (m=4) – MS Switchgear

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Lubrication	9	Table 2-7
2	Operating Mechanism	5	Table 2-7
3	Switch Contact	4	Equation 2-2
4	Space Heater	2	Table 2-7
5	Arc Contact	3	Table 2-7

Table 2-6 Service Record Sub-Condition Parameters and Weights (m=5) – MS Switchgear

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Overall	1	Table 2-7

2.1.2 Condition Criteria

- **Inspection and Tests**

The score based on individual inspection in the past years is calculated as:

$$Average\ Score = \frac{\sum W_i Score_i}{\sum W_i}$$

Equation 2-1

Where *i* represents the year of inspection

And the weights for different inspection years are as follows

Year (i)	Weight (W_i)
2019	1
2018	0.9
2017	0.8
2016	0.7
2015	0.6
2014	0.5
2013	0.4
2012	0.3
2011	0.2
2010	0.1
2009	0

All the condition scores are based on WNP’s inspection grading results as follows.

Individual Inspection

Table 2-7 Individual Inspection Criteria - MS Switchgear

Score	Inspection Input
4	Normal
3.5	Acceptable
1	Needs Repair
2.5	Corrected
0.5	Marginal
0	Unacceptable
3	Replaced

Contact Resistance

Contact resistance test results of breaker are checked against the manufacturer specification limits.

$$Score = 4*[1-R/(2*R_{limit})]$$

Equation 2-2

Where R highest measured contact resistances among all phases ($\mu\Omega$)

R_{limit} manufacturer specification limit ($\mu\Omega$)

In this study, a default industry limit of 300 $\mu\Omega$ was adopted.

Insulation Resistance

Contact resistance test results of breaker are checked against the industry practice limits.

$$Score = 4*[1-R_{limit}/(2*R)]$$

Equation 2-3

Where R lowest measured insulation resistances among all phases ($M\Omega$)

R_{limit} industry practice limit ($M\Omega$)

In this study, a default industry limit of 100 $M\Omega$ was adopted.

- **Age Limiting factor**

Age was used as a limiting factor to reflect the degradation of asset unit as time passed by. Refer to section 1.1.2 for principle.

In this project, the parameters of MS Switchgear age limiting curve are shown in the following table, based on subject matter expert feedback from WNP.

Table 2-8 Age Limiting Curve Parameters - MS Switchgear

Asset Type	α	β
MS Switchgear	**52.9463**	**5.3493**

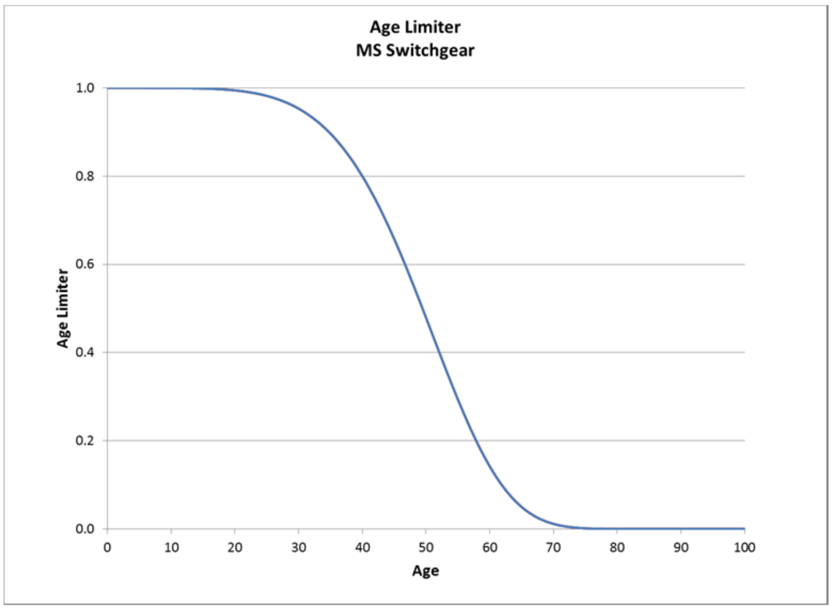

Figure 2-1 Age Limiting Factor Criteria - - MS Switchgear

2.2 Age Distribution

The average age was 25 for MS Switchgear. The age distribution was as follows.

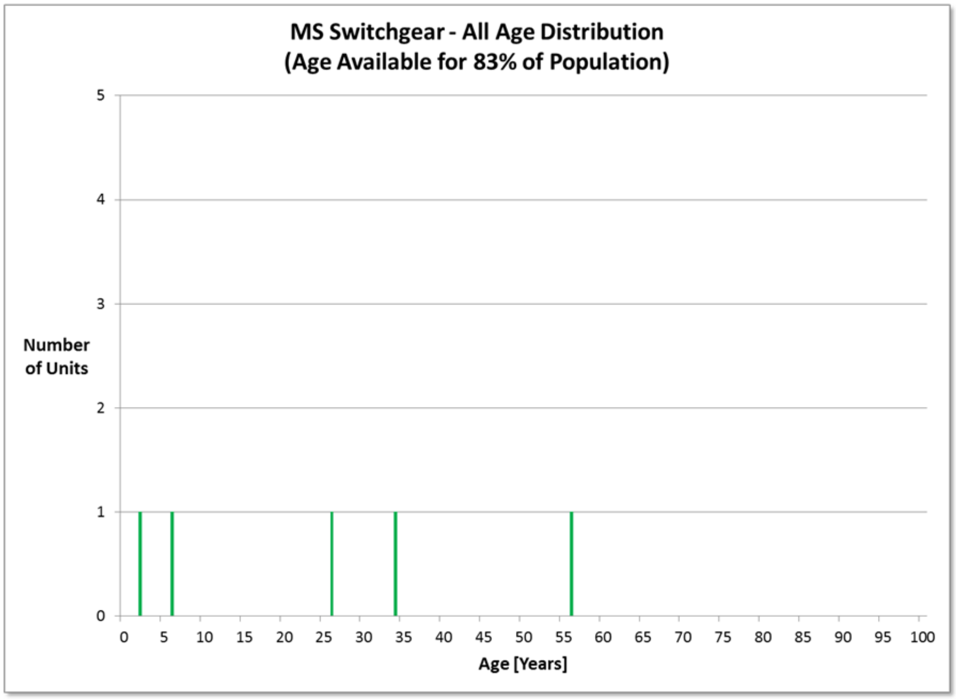

Figure 2-2 Age Distribution –MS Switchgear

2.3 Health Index Results

There were 6 units of MS Switchgear. All of them had sufficient data for a Health Indexing.

The average Health Index was 74% for MS Switchgear.

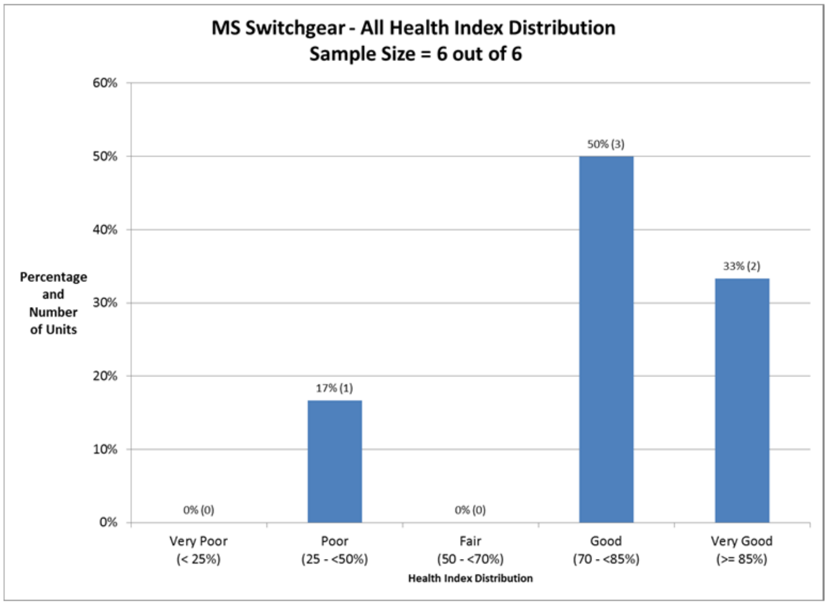

Figure 2-3 Health Index Distribution –MS Switchgear

2.4 Flagged for Action Plan

As it is assumed that MS Switchgear are proactively replaced, the risk assessment and flag-for-action plan procedure described in Section II.2.3 was applied for this asset class.

As the criticality information for MS Switchgear is unavailable, a unit becomes a candidate for replacement when its cumulative probability of failure is greater than or equal to 80%. The probability of failure is determined by the Health Index.

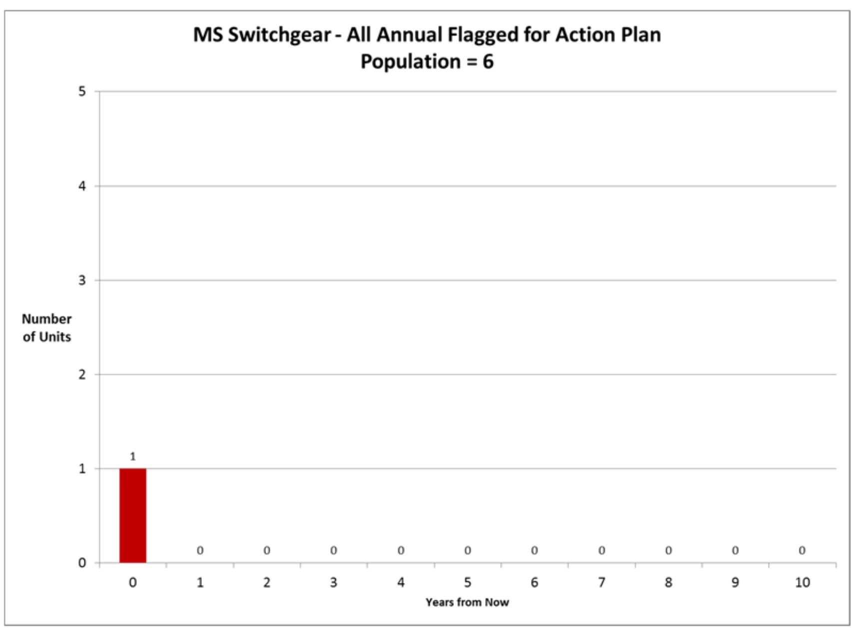

Figure 2-4 Flagged for Action Plan - MS Switchgear

2.5 Risk Based Prioritized List

The following tables show the risk based prioritization lists.

Table 2-9 Risk Based Prioritization List - MS Switchgear

Rank	ID	Substation	Voltage	Age	DAI	HI	Risk Index 100% = Most Risk 0% = Least Risk	FFA Year
1	MS-4	4	4.16	56	100%	26%	83.3%	0
2	MS-6	6	4.16		100%	83%	0.9%	>20
3	MS-2	2	4.16	6	89%	83%	0.7%	>20
4	MS-5	5	4.16	26	100%	83%	0.7%	>20
5	MS-1	1	4.16	34	100%	85%	0.5%	>20
6	MS-3	3	4.16	2	89%	85%	0.5%	>20

2.6 Data Gaps

Data for MS Switchgear included age, contact resistance and insulation resistance test results, visual inspection records. The following table shows the data gaps.

Table 2-10 Data Gap for MS Switchgear

Data Gap (Sub-Condition Parameter)	Parent Condition Parameter	Priority	Description	Source of Data
Historic Removal Record		☆☆☆	Age at removal	Inventory Database

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3 MS LOAD SWITCHES

3.1 Health Index Formula

Assume a parameter scoring system of 0 through 4, where 0 and 4 represent the "worst" and "best" scores respectively. Thus, the maximum score for any condition or sub-condition parameter (maximum CPS and CPF) is "4".

3.1.1 Condition and Sub-Condition Parameters

Table 3-1 Condition Parameter and Weights – MS Load Switches

m	Condition Parameter	WCP_m	Sub-Condition Parameters
1	Bus and Cable	2	Table 3-2
2	LV Compartment	1	Table 3-3
3	Cubicle	1	Table 3-4
4	Switch	4	Table 3-5
5	Service Record	2	Table 3-6
	Age Limiting		Figure 3-1

Table 3-2 Bus and Cable Sub-Condition Parameters and Weights (m=1) – MS Load Switches

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Cable Termination	2	Table 3-7
2	Insulator-Barrier	3	Table 3-7 Equation 3-3
3	Grounding	1	Table 3-7

Table 3-3 LV Compartment Sub-Condition Parameters and Weights (m=2) – MS Load Switches

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Protection	3	Table 3-7

Table 3-4 Cubicle Sub-Condition Parameters and Weights (m=3) – MS Load Switches

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Mechanical Interlocks	2	Table 3-7

Table 3-5 Switch Sub-Condition Parameters and Weights (m=4) – MS Load Switches

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Lubrication	9	Table 3-7
2	Operating Mechanism	5	Table 3-7
3	Switch Contact	4	Equation 3-2
4	Arc Contact	3	Table 3-7

Table 3-6 Service Record Sub-Condition Parameters and Weights (m=5) – MS Load Switches

n	Sub-Condition Parameter	$WCPF_n$	Condition Criteria Table
1	Overall	1	Table 3-7

3.1.2 Condition Criteria

- **Inspection and Tests**

The score based on individual inspection in the past years is calculated as:

$$Average\ Score = \frac{\sum W_i Score_i}{\sum W_i}$$

Equation 3-1

Where *i* represents the year of inspection

And the weights for different inspection years are as follows

Year (i)	Weight (W_i)
2019	1
2018	0.9
2017	0.8
2016	0.7
2015	0.6
2014	0.5
2013	0.4
2012	0.3
2011	0.2
2010	0.1
2009	0

All the condition scores are based on WNP's inspection grading results as follows.

Individual Inspection

Table 3-7 Individual Inspection Criteria - MS Load Switches

Score	Inspection Input
4	Normal
3.5	Acceptable
1	Needs Repair
2.5	Corrected
0.5	Marginal
0	Unacceptable
3	Replaced

Contact Resistance

Contact resistance test results of breaker are checked against the manufacturer specification limits.

$$Score = 4*[1-R/(2*R_{limit})]$$

Equation 3-2

Where R highest measured contact resistances among all phases ($\mu\Omega$)

R_{limit} manufacturer specification limit ($\mu\Omega$)

In this study, a default industry limit of 300 $\mu\Omega$ was adopted.

Insulation Resistance

Contact resistance test results of breaker are checked against the industry practice limits.

$$Score = 4*[1-R_{limit}/(2*R)]$$

Equation 3-3

Where R lowest measured insulation resistances among all phases ($M\Omega$)

R_{limit} industry practice limit ($M\Omega$)

In this study, a default industry limit of 100 $M\Omega$ was adopted.

- **Age Limiting Factor**

Age was used as a limiting factor to reflect the degradation of asset unit as time passed by. Refer to section 1.1.2 for principle.

In this project, the parameters of MS Load Switches age limiting curve are shown in the following table, based on subject matter expert feedback from WNP.

Table 3-8 Age Limiting Curve Parameters - MS Load Switches

Asset Type	α	β
MS Load Switches	**55.6475**	**7.0627**

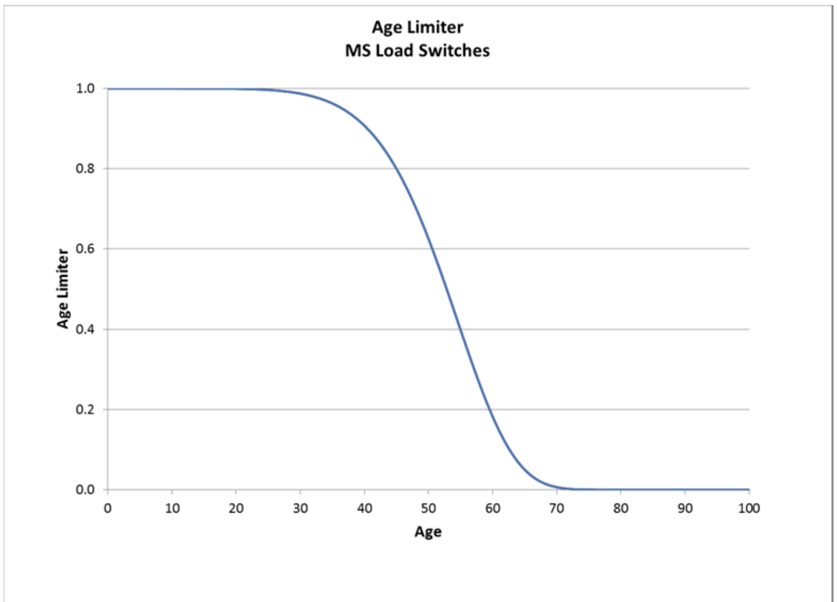

Figure 3-1 Age Limiting Factor Criteria - - MS Load Switches

3.2 Age Distribution

The average age was 25 for MS Load Switches. The age distribution was as follows.

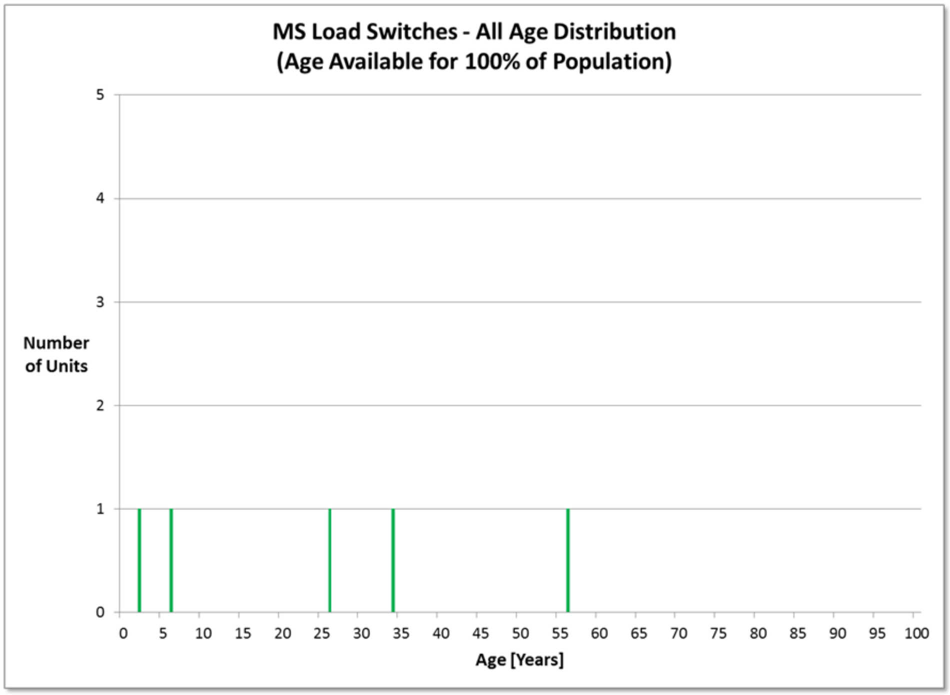

Figure 3-2 Age Distribution –MS Load Switches

3.3 Health Index Results

There were 6 units of MS Load Switches. All of them had sufficient data for a Health Indexing.

The average Health Index was 75% for MS Load Switches.

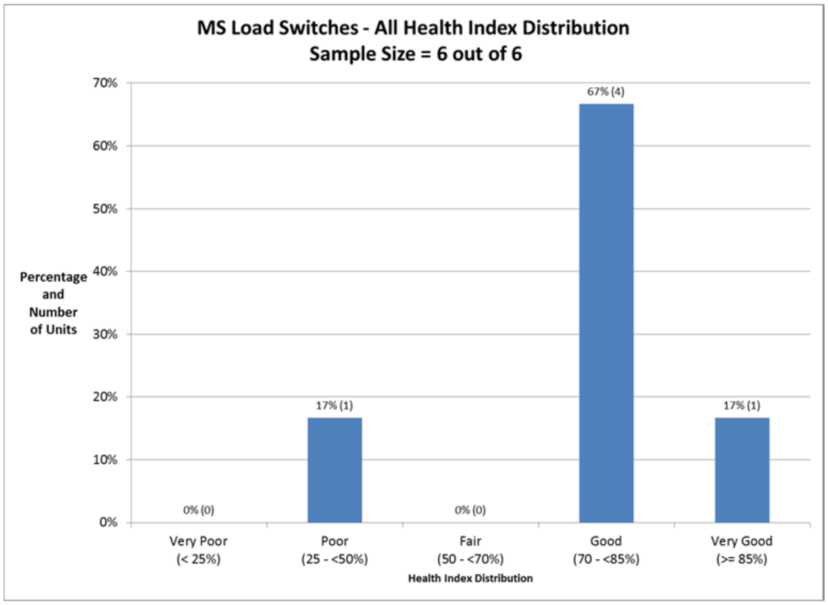

Figure 3-3 Health Index Distribution –MS Load Switches

3.4 Flagged for Action Plan

As it is assumed that MS Load Switches are proactively replaced, the risk assessment and flag-for-action plan procedure described in Section II.2.3 was applied for this asset class.

As the criticality information for MS Load Switches is unavailable, a unit becomes a candidate for replacement when its cumulative probability of failure is greater than or equal to 80%. The probability of failure is determined by the Health Index.

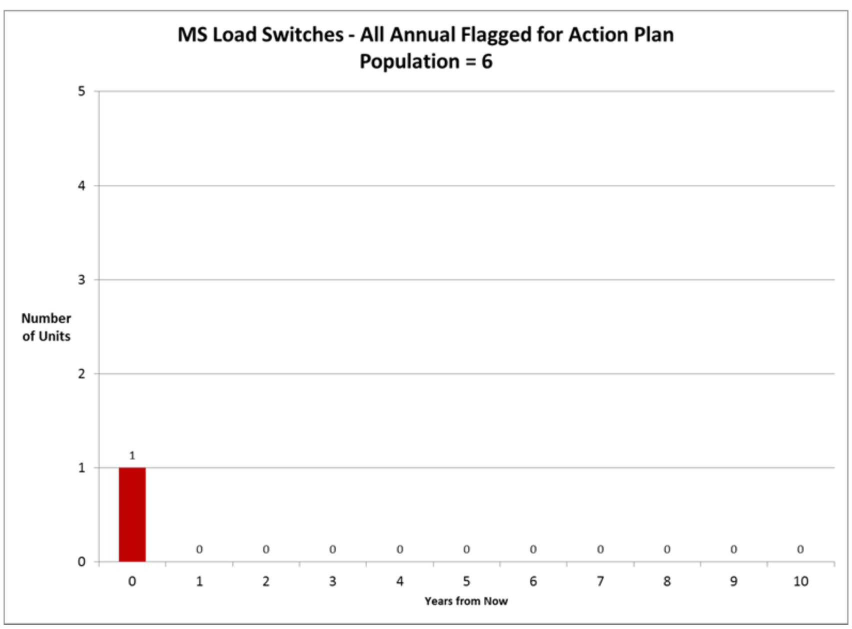

Figure 3-4 Flagged for Action Plan - MS Load Switches

3.5 Risk Based Prioritized List

The following tables show the risk based prioritization lists.

Table 3-9 Risk Based Prioritization List - MS Load Switches

Rank	ID	Substation	Voltage	Age	DAI	HI	Risk Index 100% = Most Risk 0% = Least Risk	FFA Year
1	MS-4	4	44	56	90%	35%	78.0%	0
2	MS-1	1	44	34	100%	79%	1.9%	>20
3	MS-2	2	44	6	100%	82%	0.9%	>20
4	MS-5	5	44	26	100%	83%	0.9%	>20
5	MS-6	6	44		100%	84%	0.7%	>20
6	MS-3	3	44	2	90%	87%	0.3%	>20

3.6 Data Gaps

Data for MS Load Switches included age, contact resistance and insulation resistance test results, visual inspection records. The following table shows the data gaps.

Table 3-10 Data Gap for MS Load Switches

Data Gap (Sub-Condition Parameter)	Parent Condition Parameter	Priority	Description	Source of Data
Historic Removal Record		★★★	Age at removal	Inventory Database

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4 PAD MOUNTED TRANSFORMERS

4.1 Health Index Formula

Assume a parameter scoring system of 0 through 4, where 0 and 4 represent the "worst" and "best" scores respectively. Thus, the maximum score for any condition or sub-condition parameter (maximum CPS and CPF) is "4".

4.1.1 Condition and Sub-Condition Parameters

Table 4-1 Condition Parameter and Weights - Pad Mounted Transformers

m	Condition parameter	WCP_m	Sub-Condition Parameters
1	Connection and Insulation	3	Table 4-2
2	Service Record	4	Table 4-3
	Age Limiting Factor		Figure 4-1

Table 4-2 Connection Sub-Condition Parameters and Weights (m=1) - Pad Mounted Transformers

n	Sub-Condition Parameter	$WSCP_n$	Condition Criteria Table
2	Elbow	4	Table 4-5
3	Grounding	1	Table 4-4

Table 4-3 Service Record Sub-Condition Parameters and Weights (m=2) - Pad Mounted Transformers

n	Sub-Condition Parameter	$WSCP_n$	Condition Criteria Table
1	Overall	2	Table 4-4

4.1.2 Condition Criteria

- **Inspection and Tests**

The score based on individual inspection in the past years is calculated as:

$$Average\ Score = \frac{\sum W_i Score_i}{\sum W_i}$$

Equation 4-1

Where *i* represents the year of inspection

And the weights for different inspection years are as follows

Year (i)	Weight (W_i)
2019	1
2018	0.9
2017	0.8
2016	0.7
2015	0.6
2014	0.5
2013	0.4
2012	0.3
2011	0.2
2010	0.1
2009	0

All the condition scores are based on WNP's inspection grading results as follows.

Defect

Table 4-4 Defect Criteria - Pad Mounted Transformers

Score	Condition Description
4	Excellent
2	Fair
3	Good
1	Poor
3	Bonded
0	Needs Repair
0	Repair

Infrared Test

Table 4-5 Infrared Test Criteria

Score	Description (Measured Temperature Rise ΔT in C°)
4	$\Delta T < 5$
2	$5 < \Delta T < 30$
1	$30 < \Delta T < 50$
0	$\Delta T > 50$

- **Age Limiting factor**

In this project, age was used as a limiting factor to reflect the degradation of asset unit as time passed by. Principle of applying the degradation survival curve is described in Equation 1-5 of Section 1.1.2.

In this project, the parameters of Pad Mounted Transformers age limiting curve are shown in the following table, based on industry practice.

Table 4-6 Age Limiting Curve Parameters - Pad Mounted Transformers

Asset Type	α	β
Pad Mounted Transformers	**50.5544**	**6.4053**

Figure 4-1 Age Limiting Factor Criteria - - Pad Mounted Transformers

4.2 Age Distribution

The average age of the units was 23 for Pad Mounted Transformers.

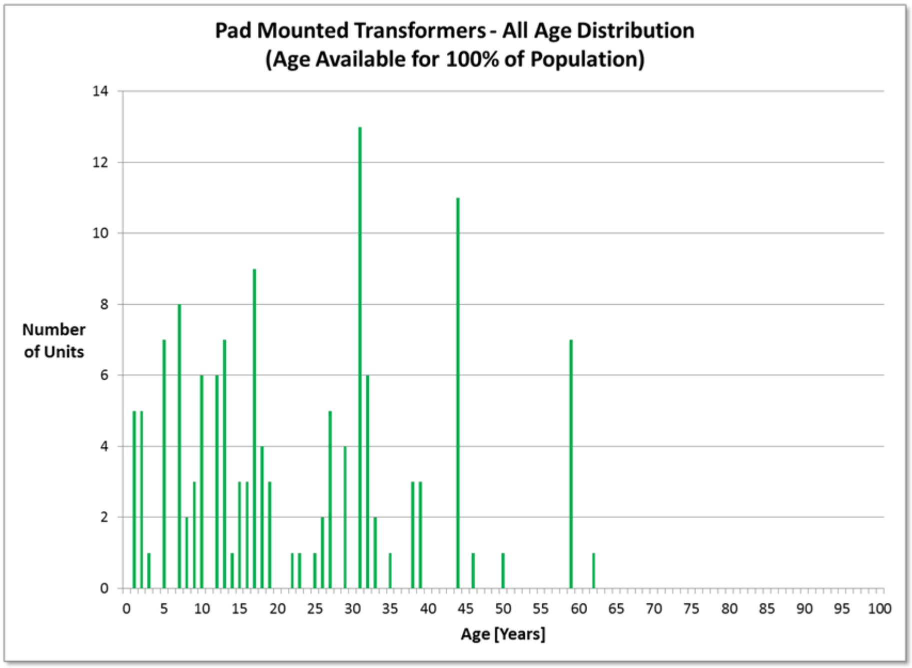

Figure 4-2 Age Distribution - Pad Mounted Transformers

4.3 Health Index Results

There were a total of 145 units of Pad Mounted Transformers. All of them had sufficient data for a Health Indexing.

The average Health Index score for this asset group was 78% for Pad Mounted Transformers.

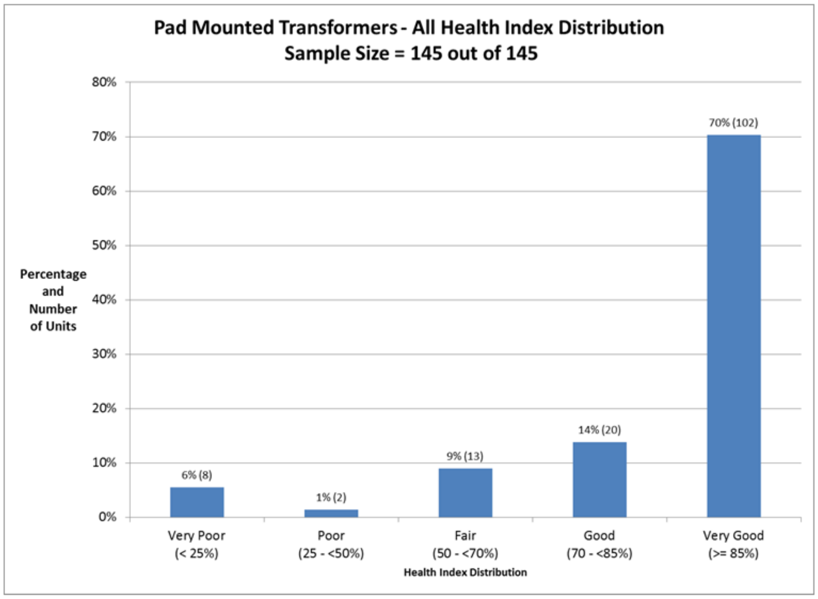

Figure 4-3 Health Index Distribution - Pad Mounted Transformers

4.4 Flagged for Action Plan

The flagged for action plan of Pad Mounted Transformers was based on the asset removal rate.

The flagged for action plans for Pad Mounted Transformers were based on the data from sample size and extrapolated to the entire population. The following diagram shows the flagged for action plans:

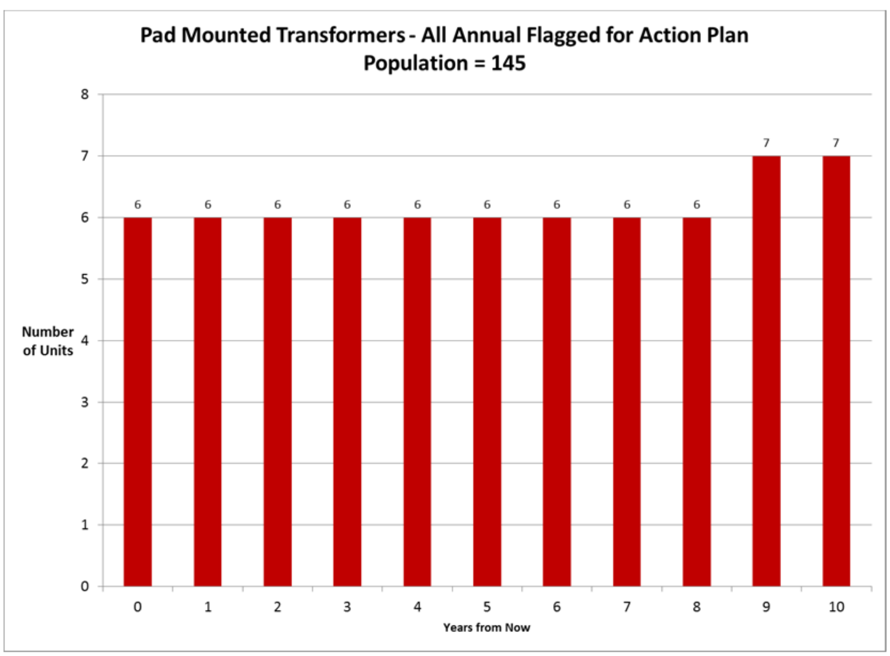

Figure 4-4 Flagged for Action Plan - Pad Mounted Transformers

4.5 Data Gaps

The data used for Pad Mounted Transformers assessment included age, overall inspection and some infrared test results.

The data gaps are as follows.

Table 4-7 Data Gap for Pad Mounted Transformers

Data Gap (Sub-Condition Parameter)	**Parent Condition Parameter**	**Priority**	**Object or Component Addressed**	**Description**	**Source of Data**
Tank Corrosion	Physical Condition	☆	Foundation	Physically worn-out	On-site visual inspection
Access		☆	Entrance	Physically locked	On-site visual inspection
Base		☆	Foundation	Physically worn-out	On-site visual inspection
Oil Leak	Connection and Insulation Condition	☆ ☆ ☆	Transformer Oil	Leakage	On-site visual inspection
Insulator		☆ ☆	Insulation	Insulation Defect	Test
Gasket	Connection	☆	Gasket	Sealing issue	On-site visual inspection
Loading	Service Record	☆	Transformer load	Monthly 15 min peak load throughout years	Operation Record
Historic Removal Record		☆ ☆ ☆	Age at removal		Inventory Database

5 POLE MOUNTED TRANSFORMERS

5.1 Health Index Formula

Assume a parameter scoring system of 0 through 4, where 0 and 4 represent the “worst” and “best” scores respectively. Thus, the maximum score for any condition or sub-condition parameter (maximum CPS and CPF) is “4”.

5.1.1 Condition and Sub-Condition Parameters

Table 5-1 Condition Parameter and Weights - Pole Mounted Transformers

m	Condition parameter	WCP_m	Sub-Condition Parameters
1	Connection and Insulation	3	Table 5-2
2	Service Record	4	Table 5-3
	Age Limiting Factor		Figure 5-1

Table 5-2 Connection Sub-Condition Parameters and Weights (m=1) - Pole Mounted Transformers

n	Sub-Condition Parameter	$WSCP_n$	Condition Criteria Table
2	Elbow	4	Table 5-5
3	Grounding	1	Table 5-4

Table 5-3 Service Record Sub-Condition Parameters and Weights (m=2) - Pole Mounted Transformers

n	Sub-Condition Parameter	$WSCP_n$	Condition Criteria Table
1	Overall	2	Table 5-4

5.1.2 Condition Criteria

- **Inspection and Tests**

The score based on individual inspection in the past years is calculated as:

$$Average\ Score = \frac{\sum W_i Score_i}{\sum W_i}$$

Equation 5-1

Where *i* represents the year of inspection

And the weights for different inspection years are as follows

Year (i)	Weight (W_i)
2019	1
2018	0.9
2017	0.8
2016	0.7
2015	0.6
2014	0.5
2013	0.4
2012	0.3
2011	0.2
2010	0.1
2009	0

All the condition scores are based on WNP's inspection grading results as follows.

Defect

Table 5-4 Defect Criteria - Pole Mounted Transformers

Score	Condition Description
4	Excellent
2	Fair
3	Good
1	Poor
3	Bonded
0	Needs Repair
0	Repair

Infrared Test

Table 5-5 Infrared Test Criteria - Pole Mounted Transformers

Score	Description (Measured Temperature Rise ΔT in C°)
4	$\Delta T < 5$
2	$5 < \Delta T < 30$
1	$30 < \Delta T < 50$
0	$\Delta T > 50$

- **Age Limiting factor**

In this project, age was used as a limiting factor to reflect the degradation of asset unit as time passed by. Principle of applying the degradation survival curve is described in Equation 1-5 of Section 1.1.2.

In this project, the parameters of Pole Mounted Transformers age limiting curve are shown in the following table, based on industry practice.

Table 5-6 Age Limiting Curve Parameters - Pole Mounted Transformers

Asset Type	α	β
Pad Mounted Transformers	**41.6629**	**2.8489**

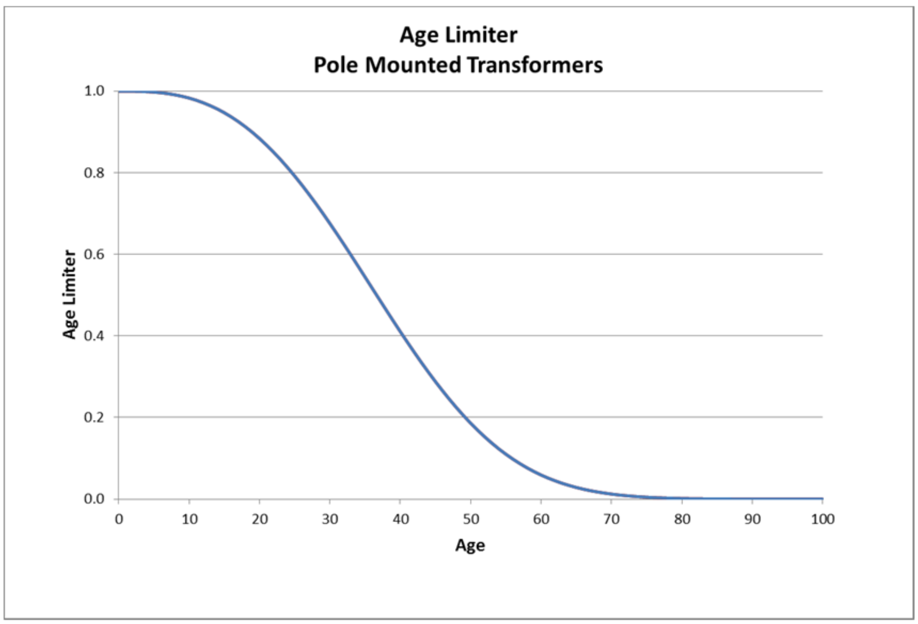

Figure 5-1 Age Limiting Factor Criteria - - Pole Mounted Transformers

5.2 Age Distribution

The average ages of the units were 25 and 18, for single phase and three phase Pole Mounted Transformers respectively.

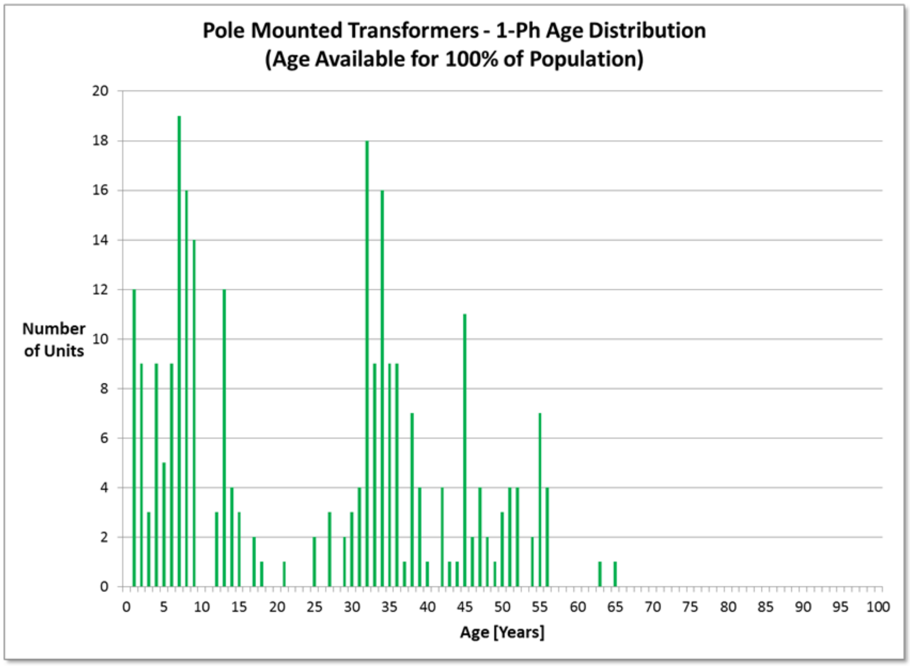

Figure 5-2 Age Distribution - Pole Mounted Transformers (1-Phase)

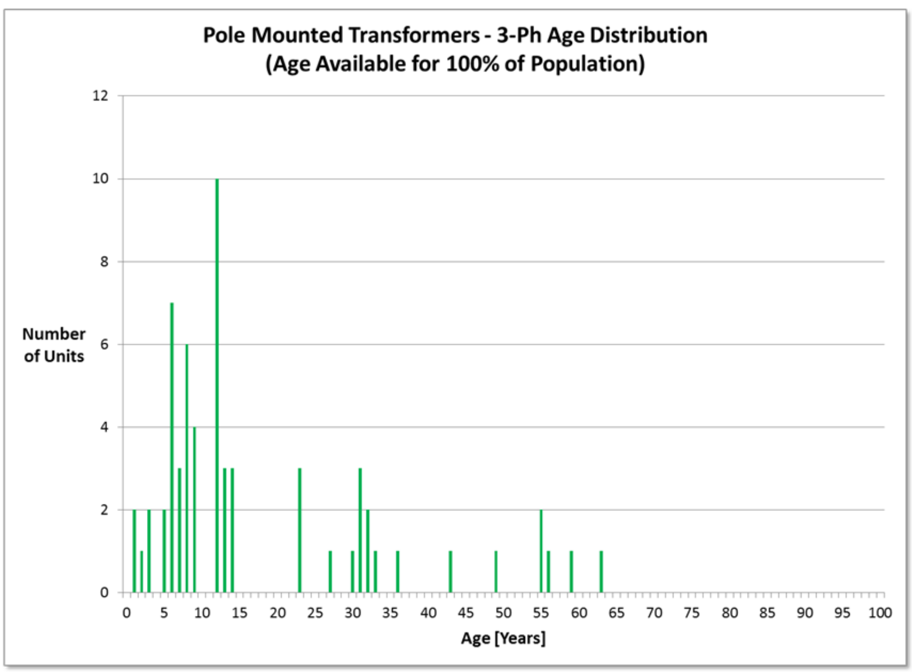

Figure 5-3 Age Distribution - Pole Mounted Transformers (3-Phase)

5.3 Health Index Results

There were a total of 458 and 64 units of single phase and three phase Pole Mounted Transformers respectively. All of them had sufficient data for a Health Indexing.

The average Health Index scores for this asset group were 68% and 74%, for single phase and three phase Pole Mounted Transformers respectively.

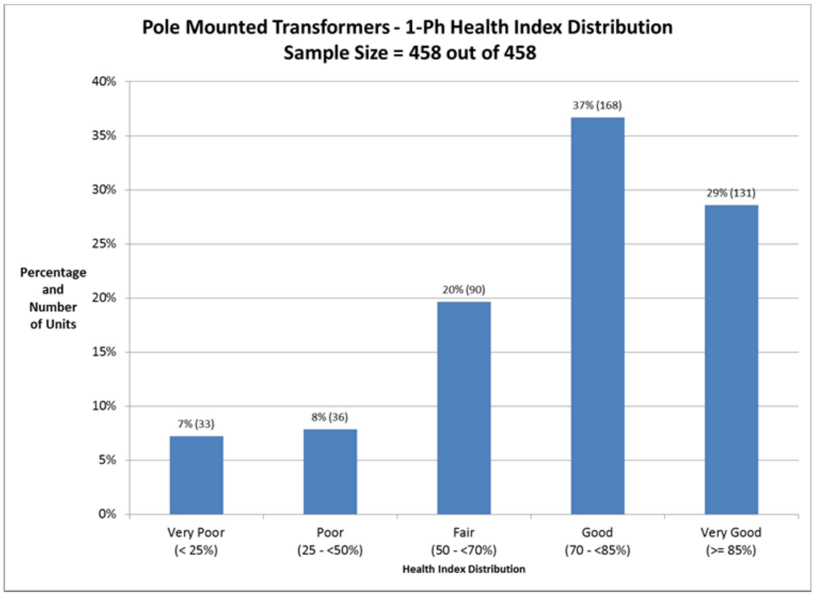

Figure 5-4 Health Index Distribution - Pole Mounted Transformers (1-Phase)

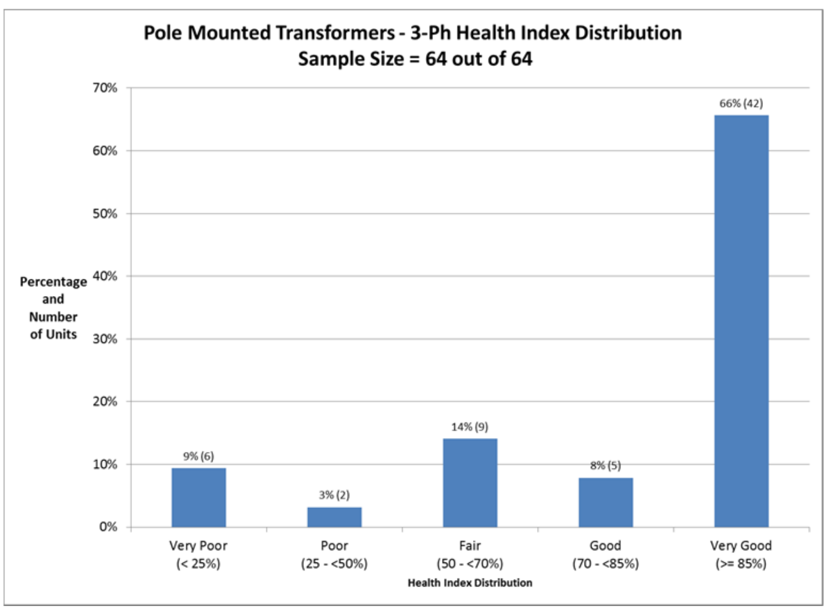

Figure 5-5 Health Index Distribution - Pole Mounted Transformers (3-Phase)

5.4 Flagged for Action Plan

The flagged for action plan of Pole Mounted Transformers was based on the asset removal rate.

The flagged for action plans for Pole Mounted Transformers were based on the data from sample size and extrapolated to the entire population. The following diagram shows the flagged for action plans:

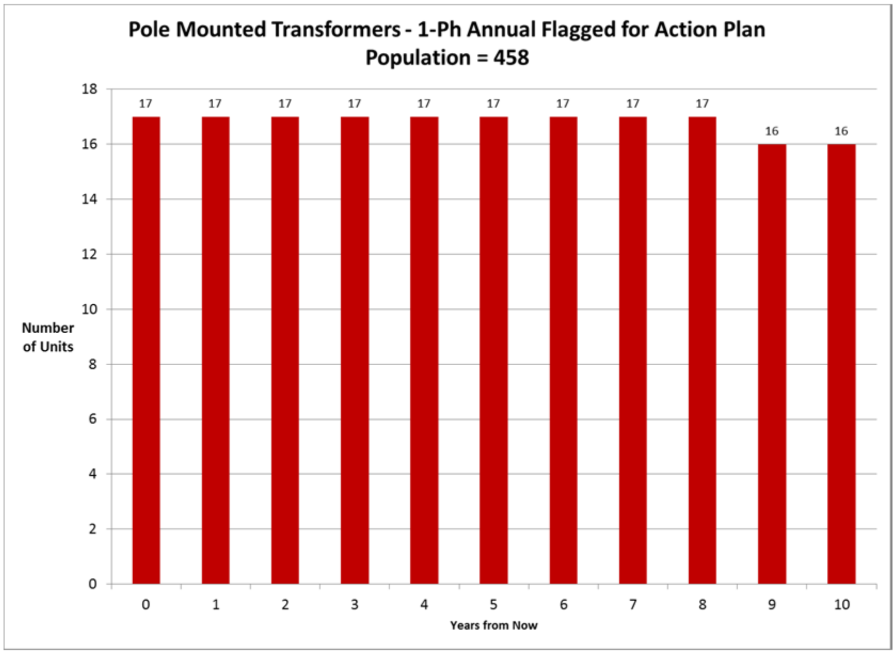

Figure 5-6 Flagged for Action Plan - Pole Mounted Transformers (1-Phase)

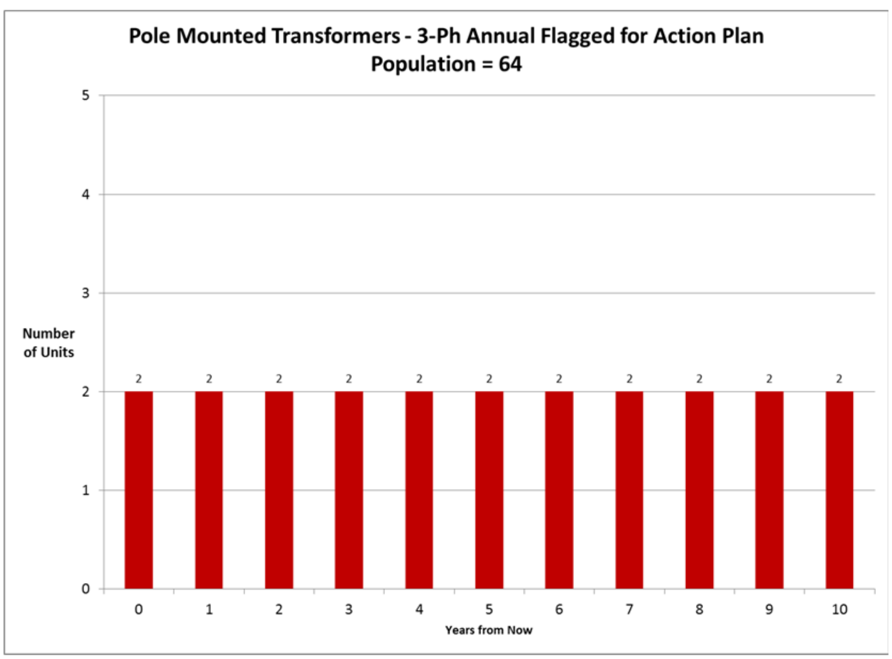

Figure 5-7 Flagged for Action Plan - Pole Mounted Transformers (3-Phase)

5.5 Data Gaps

The data used for Pole Mounted Transformers assessment included age, overall inspection and some infrared test results.

The data gaps are as follows.

Table 5-7 Data Gap for Pole Mounted Transformers

Data Gap (Sub-Condition Parameter)	**Parent Condition Parameter**	**Priority**	**Object or Component Addressed**	**Description**	**Source of Data**
Tank Corrosion	Physical Condition	☆	Foundation	Physically worn-out	On-site visual inspection
Oil Leak	Connection and Insulation Condition	☆ ☆ ☆	Transformer Oil	Leakage	On-site visual inspection
Loading	Service Record	☆	Transformer load	Monthly 15 min peak load throughout years	Operation Record
Historic Removal Record		☆ ☆ ☆	Age at removal		Inventory Database

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6 POLES

6.1 Health Index Formula

Assume a parameter scoring system of 0 through 4, where 0 and 4 represent the “worst” and “best” scores respectively. Thus, the maximum score for any condition or sub-condition parameter (maximum CPS and CPF) is “4”.

6.1.1 Condition and Sub-Condition Parameters

Table 6-1 Condition Parameter and Weights - Poles

m	Condition parameter	WCP_m	Sub-Condition Parameters
1	Pole Strength	7	Table 6-2
2	Pole Condition	5	Table 6-3
3	Pole Accessories	3	Table 6-4
4	Service Records	6	Table 6-5
	Age Limiting Factor		Figure 6-1

Table 6-2 Pole Strength Sub-Condition Parameters and Weights (m=1) - Poles

n	Sub-Condition Parameter	$WSCP_n$	Condition Criteria Table
1	Hammer Test	1	Table 6-6
2	Strength Test	3	Equation 6-2

Table 6-3 Pole Condition Sub-Condition Parameters and Weights (m=2) - Poles

n	Sub-Condition Parameter	$WSCP_n$	Condition Criteria Table
1	Cracks	2	Table 6-6
2	Insects	1	Table 6-6
3	Woodpeckers	2	Table 6-6
4	Damage	3	Table 6-6
5	Decay	3	Table 6-6

Table 6-4 Pole Accessories Sub-Condition Parameters and Weights (m=3) - Poles

n	Sub-Condition Parameter	$WSCP_n$	Condition Criteria Table
1	Guy	1	Table 6-6

Table 6-5 Service Records Sub-Condition Parameters and Weights (m=4) - Poles

n	Sub-Condition Parameter	$WSCP_n$	Condition Criteria Table
1	Overall	1	Table 6-6

6.1.2 Condition Criteria

- **Inspection and Tests**

The score based on individual inspection in the past years is calculated as:

$$Average\ Score = \frac{\sum W_i Score_i}{\sum W_i}$$

Equation 6-1

Where *i* represents the year of inspection

And the weights for different inspection years are as follows

Year (i)	Weight (W_i)
2019	1
2018	0.9
2017	0.8
2016	0.7
2015	0.6
2014	0.5
2013	0.4
2012	0.3
2011	0.2
2010	0.1
2009	0

All the condition scores are based on WNP's inspection grading results as follows.

<u>Defect</u>

Table 6-6 Defect Criteria - Poles

Score	Condition Description
0	Very Poor
1	Poor
2	Average
2	Fair
3	Good
4	Excellent
4	No Decay
3	Some Decay
2	Significant Decay
1	Extreme Decay
0	Yes
2	Light

Pole Strength Test

The score of pole strength = Sigma_percentage*4/100

Equation 6-2

- **Age Limiting Factor**

In this project, age was used as a limiting factor to reflect the degradation of asset unit as time passed by. Principle of applying the degradation survival curve is described in Equation 1-5 of Section 1.1.2.

In this project, the parameters of Poles age limiting curve are shown in the following table, based on industry practice.

Table 6-7 Age Limiting Curve Parameters - Poles

Asset Type	α	β
Poles	**63.1931**	**6.4053**

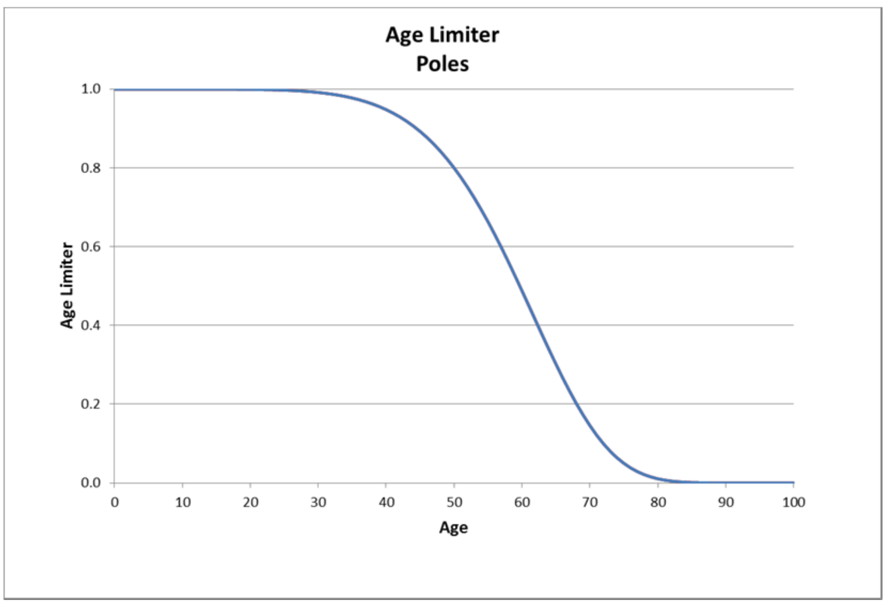

Figure 6-1 Age Limiting Factor Criteria - Poles

6.2 Age Distribution

The average ages of all units were 23 and 18 years, for 4 kV and 44 kV Poles respectively.

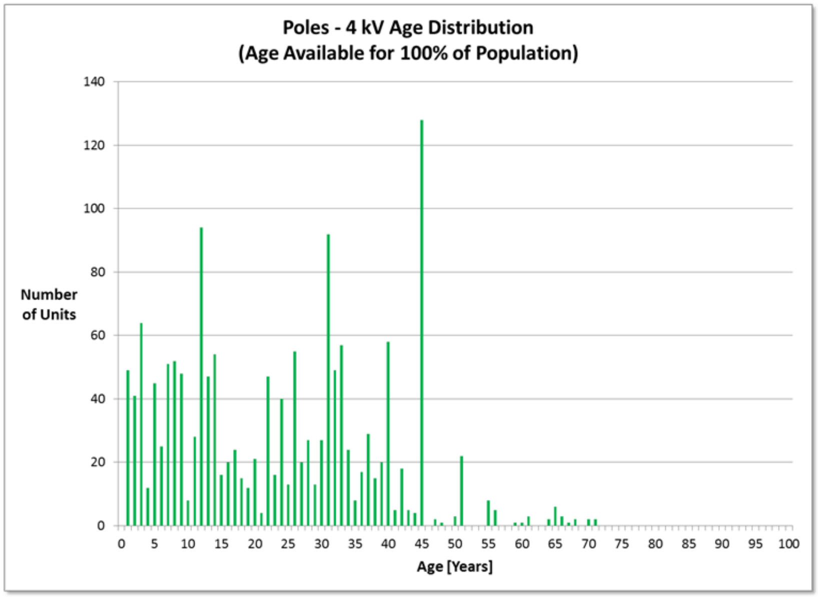

Figure 6-2 Age Distribution – Poles (4 kV)

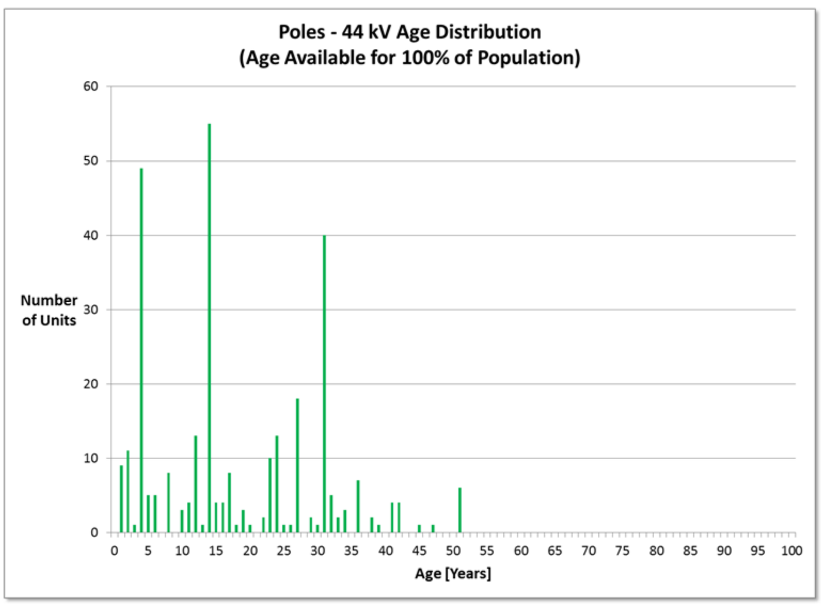

Figure 6-3 Age Distribution – Poles (44 kV)

6.3 Health Index Results

There were 1581 and 309 Poles for 4kV and 44 kV systems respectively. All of them had sufficient data for a Health Indexing.

The average Health Index scores were 84% and 86%, for 4 kV and 44 kV Poles respectively.

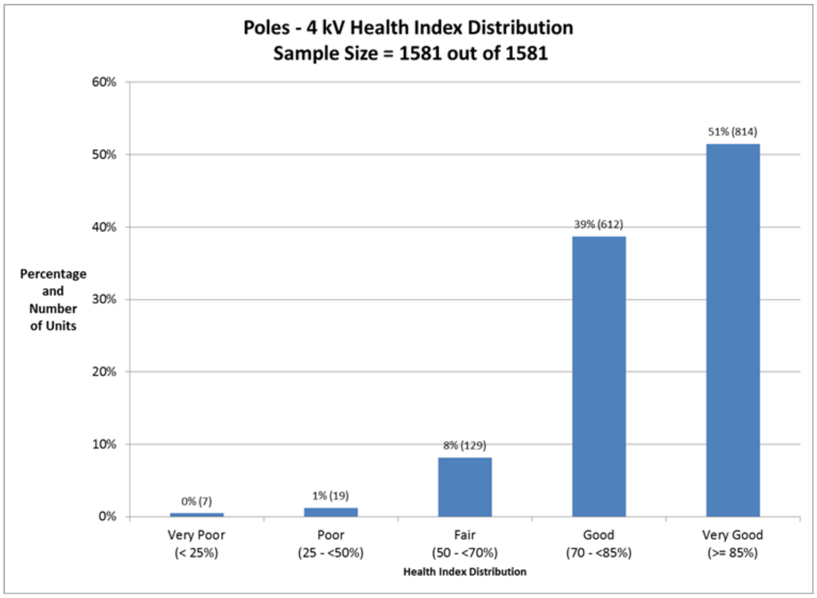

Figure 6-4 Health Index Distribution - Poles (4 kV)

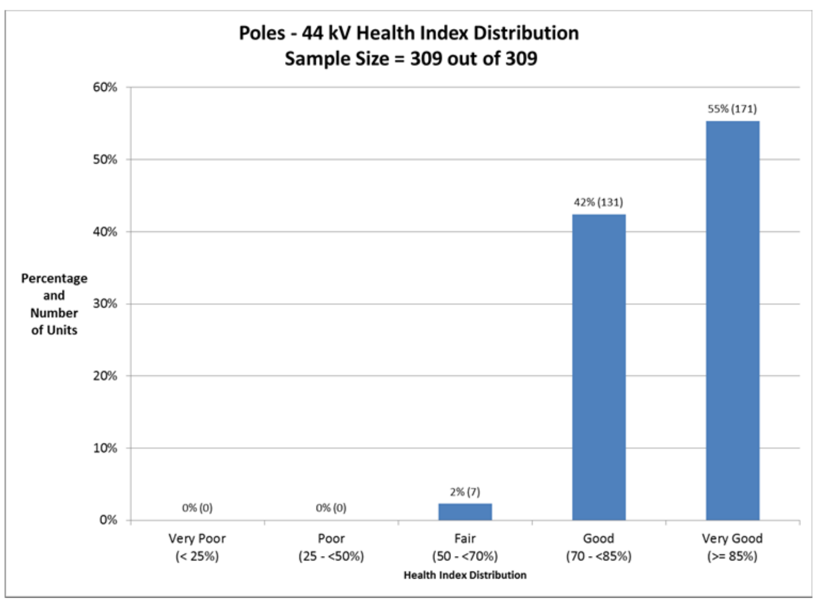

Figure 6-5 Health Index Distribution - Poles (44 kV)

6.4 Flagged for Action Plan

The flagged for action plan of Poles was based on the asset removal rate.

The flagged for action plans for Poles were based on the data from sample size and extrapolated to the entire population. The following diagrams show the flagged for action plans:

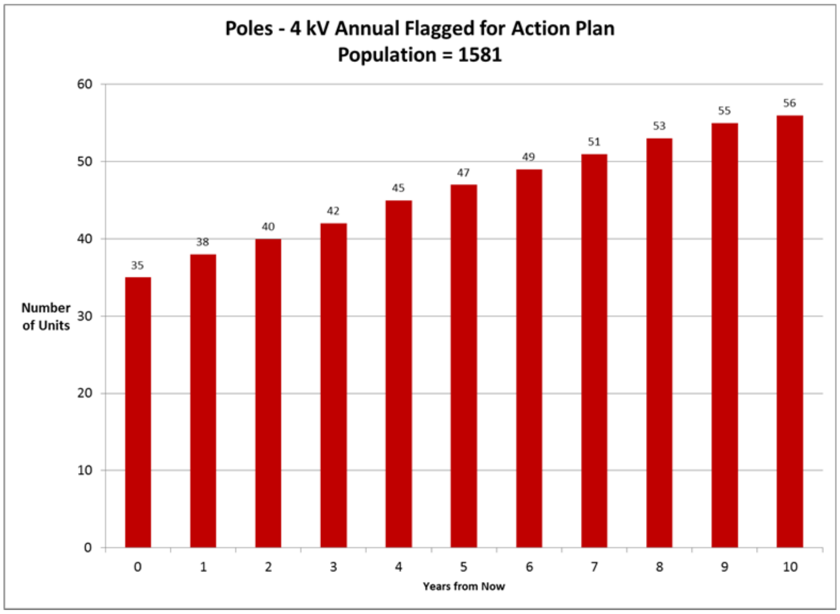

Figure 6-6 Flagged for Action Plan - Poles (4 kV)

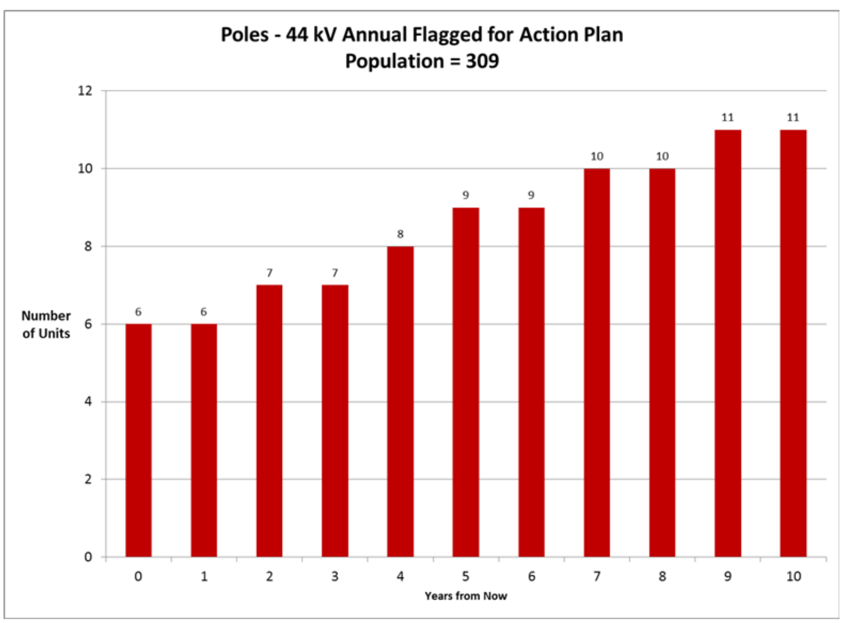

Figure 6-7 Flagged for Action Plan - Poles (44 kV)

6.5 Data Gaps

The data used for Poles assessment included age and pole inspection status condition.

The data gaps for this asset category are as follows:

Table 6-8 Data Gap for Poles

Data Gap (Sub-Condition Parameter)	**Parent Condition Parameter**	**Priority**	**Object or Component Addressed**	**Description**	**Source of Data**
Cross Arm	Pole Accessories	☆	Cross Arm	Physically worn-out	On-site visual inspection
Historic Removal Record		☆ ☆ ☆	Age at removal		Inventory Database

Appendix C. IESO Letter of Comment: WNP Distribution System Plan

IESO response to Wellington North Power Inc.'s Distribution System Plan 2021 - 2025

In accordance with the Ontario Energy Board's (OEB) Chapter 5 filing requirements to submit a Distribution System Plan (DSP) with its Cost of Service application, on August 18, 2020, Wellington North Power Inc. (WNP) sent its DSP to the Independent Electricity System Operator (IESO). The IESO has reviewed WNP's Plan and notes that it contains no investments specific to connecting Renewable Energy Generation (REG) for the Plan period 2021 - 2025.

The IESO notes that WNP's service territory is within two regional planning groups: Greater Bruce Huron Region and Kitchener-Waterloo-Cambridge-Guelph (KWCG) Region. The second regional planning cycle is underway for both of these regions and the IESO confirms that WNP has been a participating member of the Working Groups[1]. To date, regional planning activities are as follows:

Greater Bruce Huron - publication of Hydro One's Needs Assessment (NA) was May 31, 2019[2], followed by the IESO's Scoping Assessment (SA) Outcome Report and Terms of Reference published on September 19, 2019[3].

KWCG - publication of Hydro One's NA was December 19, 2018[4], followed by the IESO's SA Outcome Report and Terms of Reference published on May 9, 2019[5].

As part of a planning process requirement, WNP provided the IESO with load forecasts and other supporting information for its service territory in both regions. The results of each NA and SA shows that no capacity needs have been identified within WNP's service area.

Within its DSP, WNP makes reference to the "Wellington North Community Growth Plan" indicating that "[a]t the time of preparing its DSP, WNP is not aware of any new renewable

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[1] Working Groups: **Greater Bruce Huron**- WPN, Entegrus Power Lines Inc. (Middlesex), ERTH Power Corporation (former West Coast Huron Energy Inc. and former Erie Thames Power Lines Corporation), Festival Hydro Inc. (Distributor and Transmitter), Westario Power Inc. and Hydro One Networks Inc. (Distributor and Transmitter); **KWCG** – WPN, Alectra Utilities Corporation (former Guelph Hydro Electric Systems Inc.), Centre Wellington Hydro Ltd., Waterloo North Hydro Inc., Energy + Inc., Kitchener-Wilmot Hydro Inc., Halton Hills Hydro Inc., Milton Hydro Distribution Inc., and Hydro One Networks Inc. (Distributor and Transmitter).

[2] Hydro One's NA for Greater Bruce Huron Region, May 2019, link: https://www.hydroone.com/abouthydroone/CorporateInformation/regionalplans/greaterbrucehuron/Documents/Greater%20Bruce-Huron%20Needs%20Assessment%20Report%20-%20May%202019.pdf

[3] IESO's SA for Greater Bruce Huron Region, September 2019, link: http://www.ieso.ca/Get-Involved/Regional-Planning/Southwest-Ontario/Greater-Bruce-Huron

[4] Hydro One's NA for KWCG Region, December 2018, link: https://www.hydroone.com/abouthydroone/CorporateInformation/regionalplans/kitchenerwaterloocambridgeguelph/Documents/KWCG%20Needs%20Assessment%202018.pdf

[5] IESO's SA for KWCG Region, May 2019, link: http://www.ieso.ca/-/media/Files/IESO/Document-Library/regional-planning/KWCG/KWCG-Region-Scoping-Assessment-Outome-Report-20190509.pdf?la=en

connections over the planning period 2021-2025 as a part of the "Growth Plan" report." WNP's DSP also states that no major issues are foreseen with the connection of REG projects within the 5-year plan. As such, WHP is not putting forth any investments needed for REG connections.

The IESO submits that as WNP has no REG investments during the 5-year Distribution System Plan period no comment letter from the IESO is required to address the bullets points in the OEB's Filing Requirements for Electricity Distribution Rate Applications - Chapter 5, section 5.2.2 Coordinated planning with third parties, as follows:

d) For REG investments a distributor is expected to provide the comment letter provided by the IESO in relation to REG investments included in the distributor's DSP, along with any written response to the letter from the distributor, if applicable. The OEB expects that the IESO comment letter will include:

    - Whether the distributor has consulted with the IESO, or participated in planning meetings with the IESO
    - The potential need for co-ordination with other distributors and/or transmitters or others on implementing elements of the REG investments
    - Whether the REG investments proposed in the DSP are consistent with any Regional Infrastructure Plan

The IESO appreciates having had the opportunity to review WNP's Distribution System Plan and looks forward to working together further during the current regional planning cycle.

Appendix D1. Residential Customer Survey (2019)

Wellington North Power Inc.
290 Queen Street West, PO Box 359, Mount Forest, ON N0G 2L0
Phone: 519.323.1710 Fax: 519.323.2425
www.wellingtonnorthpower.com E-mail: wnp@wellingtonnorthpower.com
ESA # 7012854

2019 Residential Customer Survey

In Quarter 4 2019, Wellington North Power Inc. (WNP) conducted a survey of its Residential customers. The survey questions were prepared by WNP and were available to customers to complete by:

- Accessing using the LDC's website.
- Accessing on-line through Survey Monkey.
- Available at the office counter for walk-in customers.

Survey Objective

The intent of the survey was to capture customers' feedback to assist WNP with business planning for the period 2021 to 2025. The responses will help provide an insight into the services offered by WNP as well better understand the needs and preferences of our customers.

Survey Questions

Survey questions focused on the following themes:

1. Satisfaction;
2. Rating of Service Provided;
3. Power outages;
4. Effectiveness during an Outage;
5. Company profile;
6. Investment priorities;
7. Price and reliability; and
8. Trust.

The Residential customer survey ran from October 4th 2019 to December 31st 2019. By completing the survey, customers were entered into a prize-draw to win one of five $100 credits to their January 2020 electricity bill.

Survey Promotion

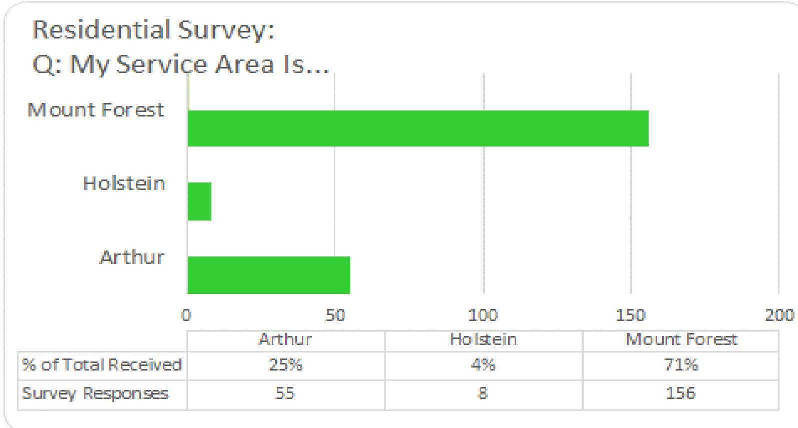
WNP promoted the survey through the following channels:

a) Bill inserts included with October, November and December bills.
b) Messages on customers' e-bill for bills issued in October, November and December.
c) Promoted on Wellington North Power's website.
d) Weekly messages posted on social media (Facebook and Twitter).
e) Walk-in customer visits to the LDC's office.

Survey Reponses

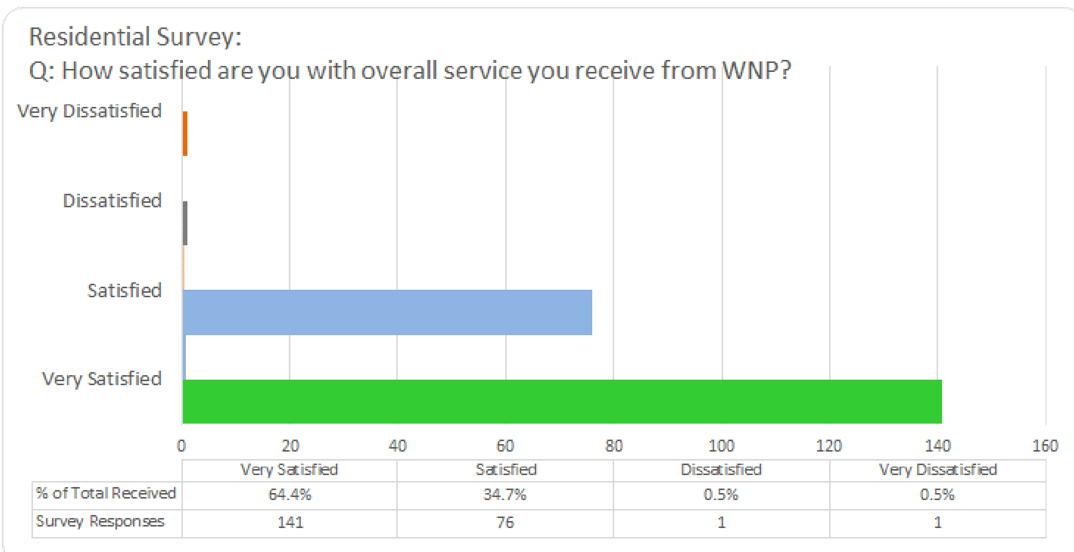
WNP received survey responses from 219 Residential customers. With 3,314 Residential accounts as at December 31st 2019 this represents a 7% response-rate. The LDC acknowledges this response rate is not statistically significant; however the responses do provide valuable feedback to how our customers perceive the services offered by Wellington North Power and assist in preparing capital plans and operating budgets.

WNP operates within three (3) service areas in Wellington North in the urban centers of Arthur, Holsten and Mount Forest. The chart below shows the survey responses received split by the service area:



1. Satisfaction

The chart below summarizes how Residential respondents rate the overall service provided by WNP:



<u>Findings:</u>

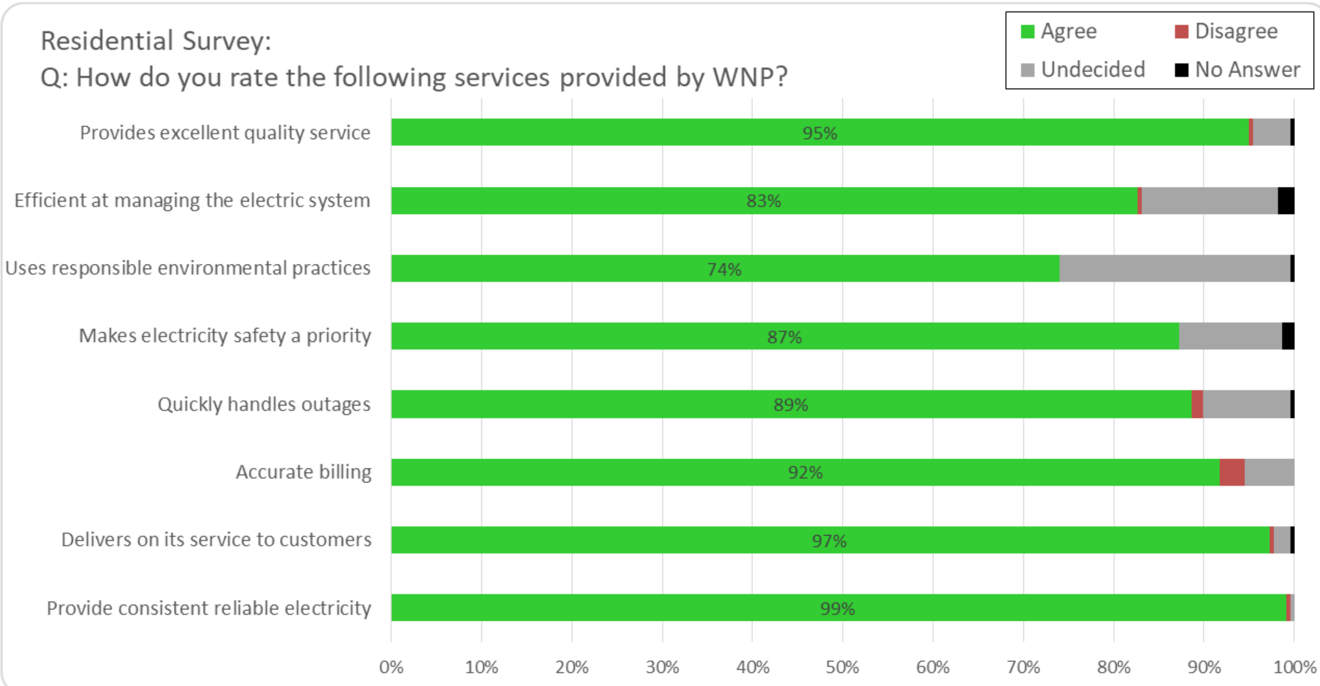
- 99% of respondents rated WNP overall service as either "Very Satisfied" or "Satisfied".
- 2 customers (1% of the survey population) rated the LDC's service as "Dissatisfied" or "Very "Dissatisfied". The responder who rated their experience of the LDC as "Very Dissatisfied" did include a comment concerning being charged late payment fees twice as well as receiving numerous alerts about late payments.

<u>For consideration:</u>

WNP is planning to make information available to customers about credit control timelines and customer service rules when the LDC implements the OEB-approved new customer service rules that come into effect in March 2020. This may help inform our customers about the regulatory rules the LDC adheres to and how we are trying to support customers managing their bill payments.

2. Service Rating

Customers were given a series of statements and asked if they "Agree", "Disagree" or were "Undecided" with each statement. The chart below shows the collated responses:



Statement	Agree	Disagree	Undecided	No Answer	Total
Provide consistent reliable electricity	99.1%	0.5%	0.5%	0.0%	100%
Delivers on its service to customers	97.3%	0.5%	1.8%	0.5%	100%
Accurate billing	91.8%	2.7%	5.5%	0.0%	100%
Quickly handles outages	88.6%	1.4%	9.6%	0.5%	100%
Makes electricity safety a priority	87.2%	0.0%	11.4%	1.4%	100%
Uses responsible environmental practices	74.0%	0.0%	25.6%	0.5%	100%
Efficient at managing the electric system	82.6%	0.5%	15.1%	1.8%	100%
Provides excellent quality service	95.0%	0.5%	4.1%	0.5%	100%

Findings:

- Of the customers that gave a definite response to the statements (i.e. "Agree" or "Disagree"), it could be summarized that customers provided a favourable opinion of the services provided by WNP.
- Reliability, service delivery and quality of service were all rated as "Agreed" by 95% or above of the response population.
- 2.7% of the response population disagreed with the statement the LDC has accurate billing.
- Responses for environmental practices, efficiently manages the electric system and safety as a priority all achieved an "Undecided" response for over 10% of the respondents.
- 87.2% of respondents agreed the LDC makes electricity safety a priority. This result concurs with the most recent ESA Public Safety Awareness survey, conducted in 2017, where the LDC achieved a rating score of 83.3%.

For consideration:

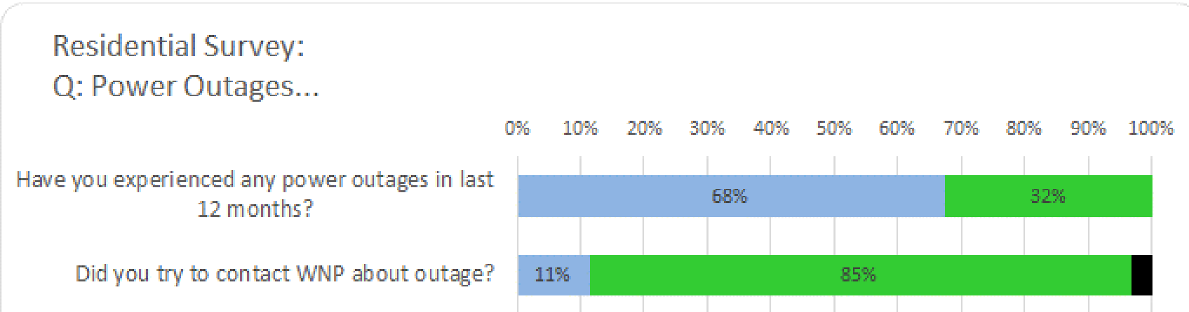
WNP needs to assess how the LDC can better communicate to customers items such as environmental practices and examples of efficient handling of the electricity system. For instance, publishing articles on these items in the local newspaper on a quarterly basis.

3. Power Outages

This question asked if customers had experienced a power outage in the past 12 months and during the outage, had they tried to contact WNP.

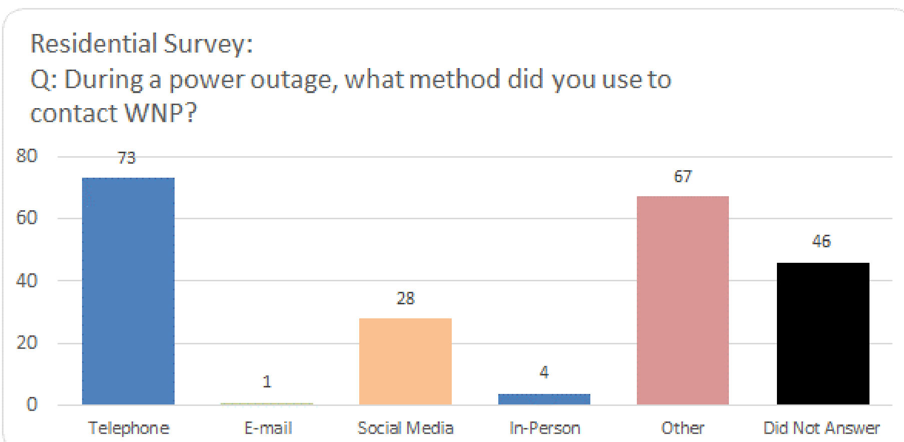
Findings:

68% respondents had experienced a power outage during the last 12 months with 11% trying to contact WNP during the outage:



	Did you try to contact WNP about outage?	Have you experienced any power outages in last 12 months?
Yes	11%	68%
No	85%	32%
No Answer	3%	0%

During an outage, 73 respondents (33% of the survey population) tried to contact WNP using the telephone whilst 67 people (31%) used an “Other” method of communication:



During business hours, all telephone calls to WNP are live-answered by a Customer Service Representative. The LDC’s office has a back-up generator that means that telephone equipment and customer-service systems are not affected during an outage. Outside of business hours, telephone calls are managed by third-party after-hours service provider, who will forward emergency messages to the On-Call line-men during a power outage.

WNP updates its website with power outage information (such as areas affected, current status and restoration times if known.) The LDC also posts the same information on social media sites (Facebook and Twitter).

For consideration:

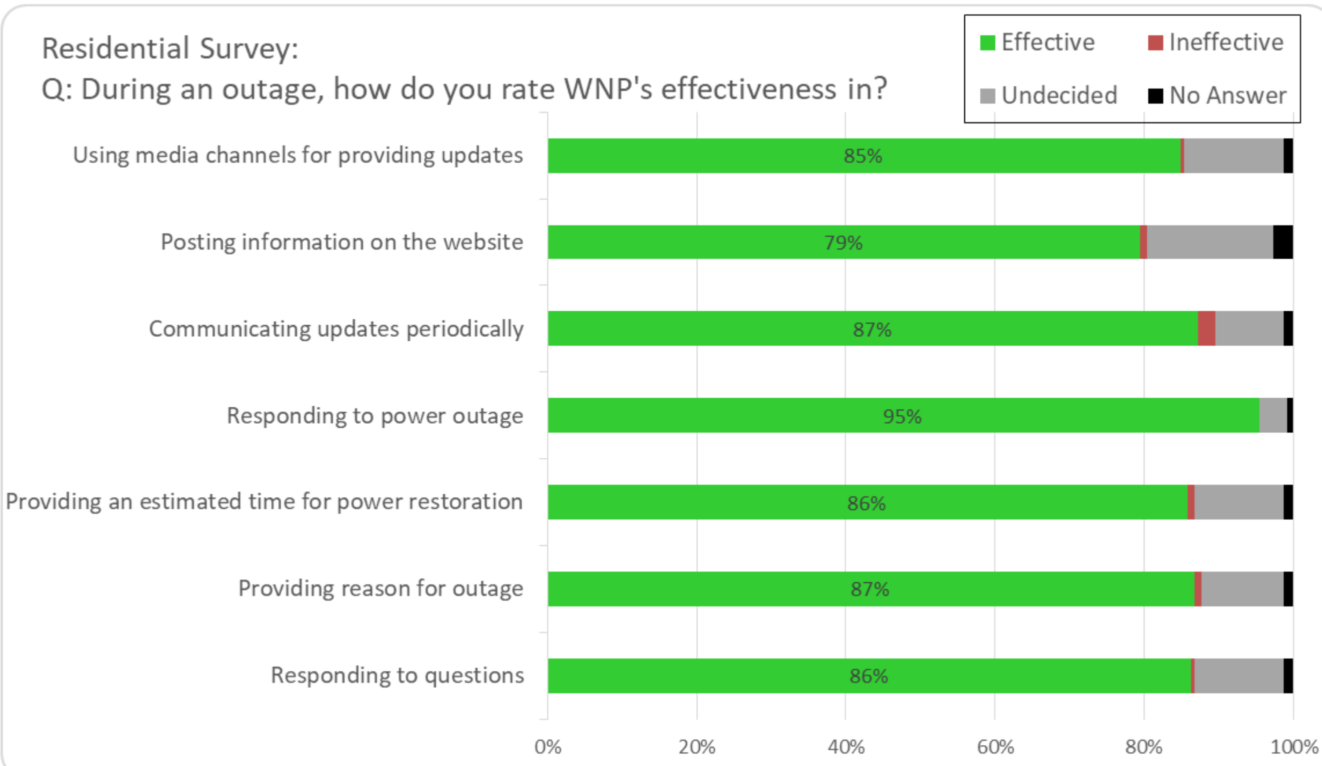
It would be interesting to know what the “Other” communication method is that 67 respondents have used; maybe, in future surveys, this question needs to include “open-text” for customers to name their communication method or preference.

4. Effectiveness during an Outage

This question asked, during an outage, how effective WNP was not only in responding to the outage but also providing information to customers. Against a seven of statements, customers could select "Effective", "Ineffective" or "Undecided".

Findings:

- 95% of respondents agreed that WNP is effective in responding to power outages
- The lowest score related to 79% of respondents rating WNP as effective in posting information on its website.
- The remaining statements all scored favourable with 85%+ of respondents rating WNP being effective in these areas.



For consideration:

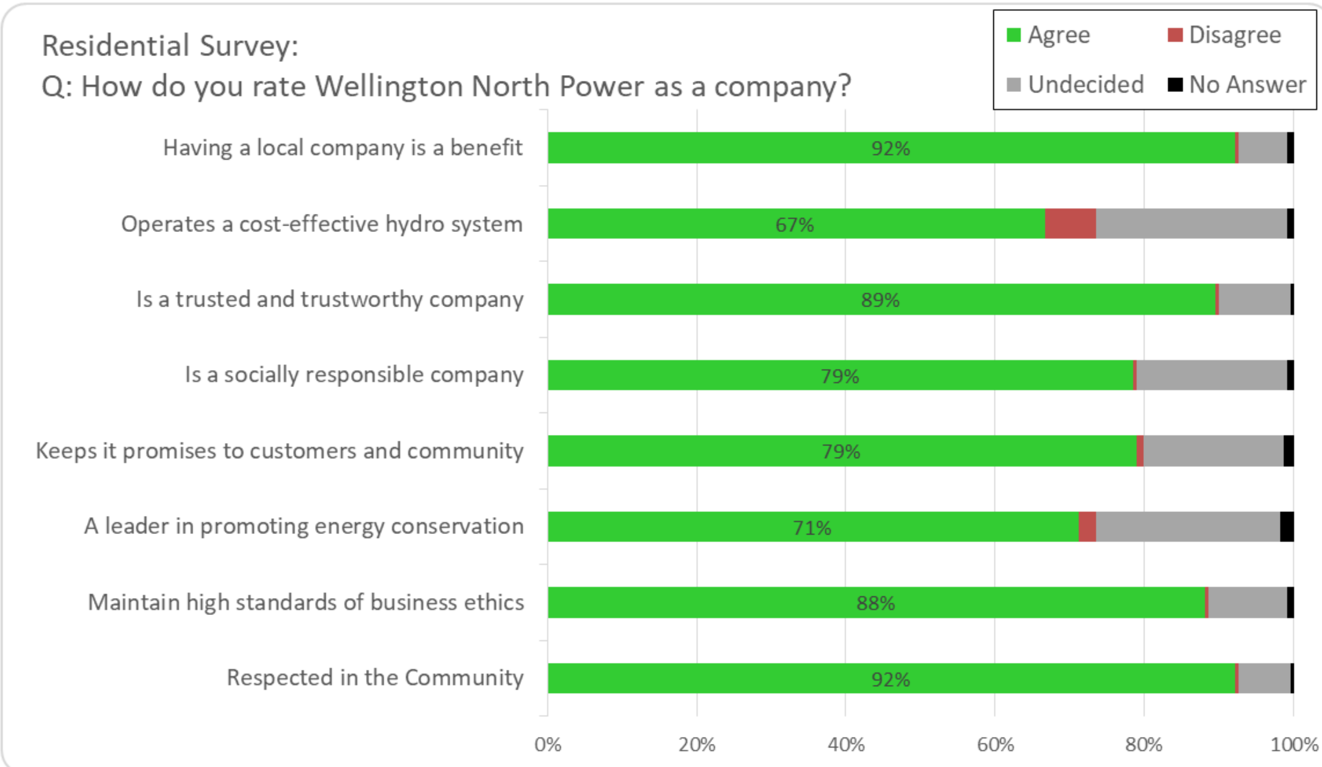
During an outage, WNP posts the same information on its social media pages as it does on its website. WNP website also shows the social media thread conversation. Consequently, LDC is bemused why respondents rated website posting effectiveness lower than social media posting effectiveness – the only rationale is customers go to social media first before checking the WNP's website.

As at January 24th 2020, the LDC had:

- 655 followers on Facebook (approx. 20% of WNP's residential customers).
- 470 followers on Twitter (approx. 14% of WNP's residential customers).

5. Company Profile

This question considered how customers felt about WNP. Customers were provided with a series of statements enabling respondents to choose either "Agree", "Disagree" or "Undecided" with each statement. The chart below shows the collated responses:



<u>Findings:</u>

Statement	Agree	Disagree	Undecided	No Answer
Respected in the Community	92.2%	0.5%	6.8%	0.5%
Maintain high standards of business ethics	88.1%	0.5%	10.5%	0.9%
A leader in promoting energy conservation	71.2%	2.3%	24.7%	1.8%
Keeps it promises to customers and community	79.0%	0.9%	18.7%	1.4%
Is a socially responsible company	78.5%	0.5%	20.1%	0.9%
Is a trusted and trustworthy company	89.5%	0.5%	9.6%	0.5%
Operates a cost-effective hydro system	66.7%	6.8%	25.6%	0.9%
Having a local company is a benefit	92.2%	0.5%	6.4%	0.9%

- 90% of the survey population (196 respondents of 219) agreed that WNP is a trusted company.
- 92% of the survey population (202 respondents) agreed that WNP is respected in the community and 88% (193 respondents) agreed the LDC has high standards of business ethics.
- 67% of the survey population (146 respondents) agreed WNP operates a cost-effective hydro system. For this statement, 26% of respondents (56 people) were "undecided" about this statement and 7% (15 people) "disagreed" with this statement.
- As a leader in promoting energy conservation, 71% (156 people) agreed with this statement; however 25% (54 people) were undecided about this statement. In March 2019 the government announced that energy conservation was to be centrally-delivered by the IESO, rather than by LDCs. Although WNP supports energy conservation, from March 2019, the LDC has reduced its' efforts in promoting energy conservation (i.e. less social-media posting about energy savings programs and no hosting of CDM stands at local community events).

<u>For consideration:</u>

WNP is respected in the communities in which it operates and needs to work towards maintaining the trust of its customers and stakeholders. The LDC office is open 5-days a week during business for customers to openly visit and talk to knowledgeable customer service staff as well as managers and the CEO/President.

From the survey results, the LDC needs to consider:

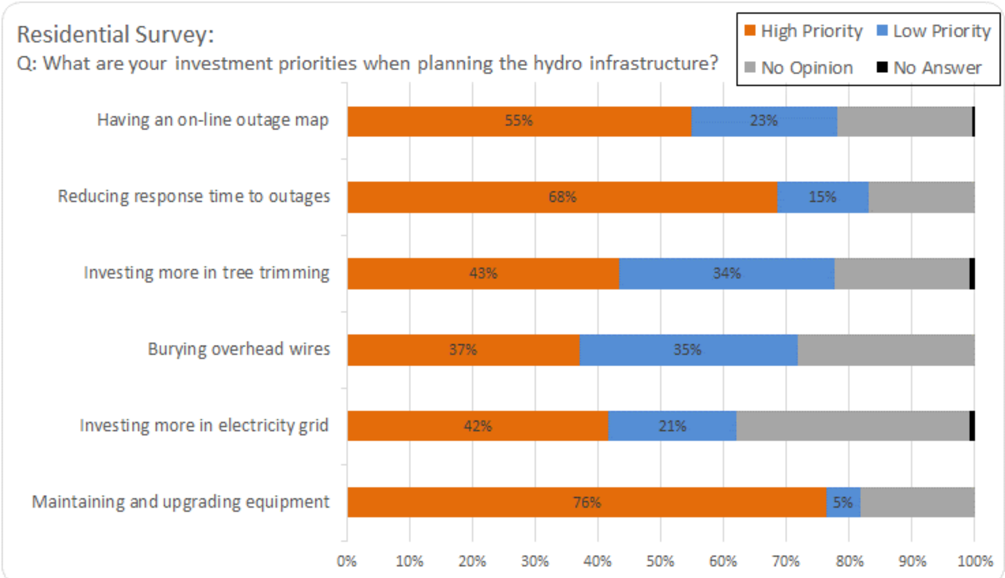
- What messages it communicates to its customers.
- How it communicates with customers.
- The demographics of the service territories.

WNP has a social media presence but this media may not appeal to the majority of the LDC's customers. The LDC could consider:

a) An article in the local newspaper each quarter about capital projects completed and future plans which could make reference to being social-responsible (i.e. safe disposal of oil-filled transformers).
b) A yearly open-house community meeting to present proposed operating budgets and capital investment plans. This may help inform our customers about what options were explored, why investment is needed and how the LDC is being cost-effective for stakeholders' needs today and for the future.

6. Investment Priorities

This question sought customers' opinions about how WNP should invest. Customers were provided with a series of statements enabling respondents to choose either "High Priority", "Low Priority" or "No Opinion" with each statement. The chart below shows the collated responses:



Findings:

Statement	High Priority	Low Priority	No Opinion	No Answer
Maintaining and upgrading equipment	76.3%	5.5%	18.3%	0.0%
Investing more in electricity grid	41.6%	20.5%	37.0%	0.9%
Burying overhead wires	37.0%	34.7%	28.3%	0.0%
Investing more in tree trimming	43.4%	34.2%	21.5%	0.9%
Reducing response time to outages	68.5%	14.6%	16.9%	0.0%
Having an on-line outage map	54.8%	23.3%	21.5%	0.5%

- "Maintaining and upgrading equipment" was the most popular "high priority" of all the statements provided. 76% of the survey population (167 respondents out of 219) rated this as a high priority whereas 5% (12 people) rates it as "low priority". (18% or 40 people had no opinion about this item).
- "Burying overhead wires" was the lowest "high priority" as rated by 37% of the respondents (81 people). A near equal number of respondents (35% or 76 people) rates this item as a "low priority".
- Of all the statements, "Investing more in electricity grid", achieved the highest "no opinion" result (37% of respondents or 81 people).

For consideration:

Regarding the statement "Investing more in electricity grid", perhaps the reason this was rated as "No Opinion" by over one-third by all respondents is because of the ambiguity of the statement. This statement was intended to gain feedback about grid-modernization and new technology; however in reflection the statement was poorly worded hence the high "no opinion" result. The LDC could consider including articles about grid-modernization and new technology in future newspaper articles to inform our customers.

Respondents rated "maintaining and upgrading equipment" as the highest priority of all the statements. WNP needs to continue with its capital investment that maintains the reliability of the distribution system at a pace that does not excessively increase hydro-rates year-over year. This planning is through good asset condition assessment programs that will assist in making informed asset replacement priority decisions.

7. Price and Reliability

This question asked customers to rate five statements from 1 being most important to them to 5 being of least important. The statements were:

a) Pay lower electricity rates with reduced reliability.
b) Pay higher electricity rates with increased reliability.
c) Increase spending to accommodate grid modernization.
d) Pay higher electricity rates to pay for burying cables.
e) Continue with current investment spending levels to balance electricity reliability and rates.

<u>Findings:</u>

The table below shows the results as a percentage of all responses received:

Statement	Most Important 1	2	3	4	Least Important 5	No Answer	Total
Pay lower electricity rates with reduced reliability	18.7%	18.7%	29.7%	9.1%	22.8%	0.9%	100%
Pay higher electricity rates with increased reliability	8.2%	16.0%	37.9%	10.5%	26.0%	1.4%	100%
Increase spending to accommodate grid modernization	12.8%	18.3%	42.9%	14.2%	11.0%	0.9%	100%
Pay higher electricity rates to pay for burying cables	8.7%	11.4%	21.9%	20.1%	37.0%	0.9%	100%
Continue with current investment spending levels to balance electricity reliability and rates	46.1%	20.5%	22.4%	5.5%	4.6%	0.9%	100%

The table below shows the results by the number of survey respondents:

Statement	Most Important 1	2	3	4	Least Important 5	No Answer	Total
Pay lower electricity rates with reduced reliability	41	41	65	20	50	2	219
Pay higher electricity rates with increased reliability	18	35	83	23	57	3	219
Increase spending to accommodate grid modernization	28	40	94	31	24	2	219
Pay higher electricity rates to pay for burying cables	19	25	48	44	81	2	219
Continue with current investment spending levels to balance electricity reliability and rates	101	45	49	12	10	2	219

- "Continue with current investment spending levels to balance electricity reliability and rates" statement was ranked as the highest "most important" score of all statements (rates as high important by 46% of respondents or 101 people out of 219).
- "Increase spending to accommodate grid modernization" was the highest neutral statement with 43% of respondents (or 94 people) scoring this a "3" (i.e. neither important nor not important).
- "Pay higher electricity rates to pay for burying cables" was rated as the "least important" statement with 37% of respondents (or 81 people) scoring this with a "5".
- Slightly more people rated paying "lower electricity rates with reduced reliability" as a least important priority compared to those that scored it as a most important (i.e. 50 people compared to 41 people).
- Over three-times the number of people rated paying "Pay higher electricity rates with increased reliability" as "least important" compared to those that rated this statement as "most important" (i.e. 57 people compared to 18 people).

<u>For consideration:</u>

In preparing its capital plans and setting operating budgets, based upon the survey result, WNP should continue with current investment spending levels to balance electricity reliability and rates.

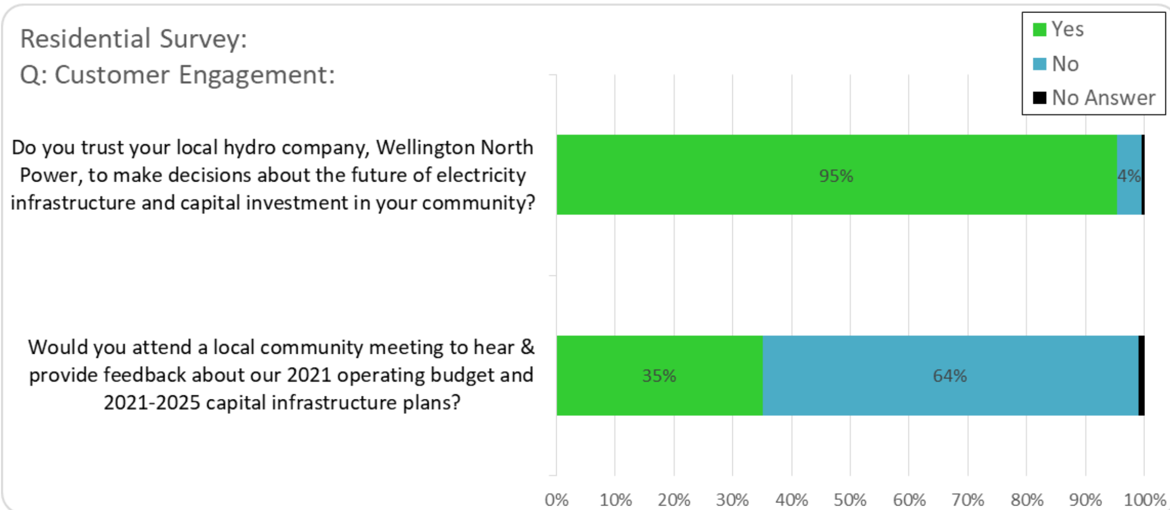
8. Trust

This question asked if WNP's customers:

a) Trusted their local hydro company to make decisions about electricity infrastructure and capital investments.
b) Interested in attending a community open house to provide feedback concerning WNP's 2021 operating budget and 5-year capital investment plan for 2021-2025.

Findings:

- 95% of respondents (209 of 219 responses) did trust their local hydro company, WNP, to make decisions concerning the electricity infrastructure.
- 35% of respondents (77 of 219 responses) would be interested in attending a community meeting.



For consideration:

WNP appreciates and acknowledges the trust bestowed on the LDC by its customers. Wellington North Power Inc. has been serving the community for over 100 years and is committed to continuing to provide outstanding service to its customers and stakeholders.

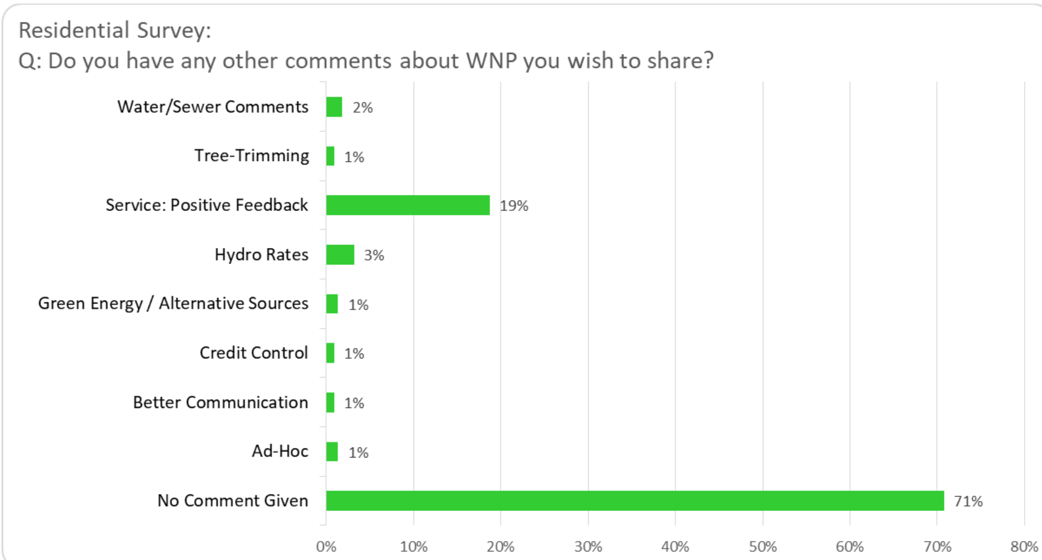
Given the response from the residential customers who participated in the survey, WNP should consider hosting a community meeting to enable customers to hear about and be involved in WNP's 2021 operating budget and capital investment plans.

9. Other Comments Received

Customers were given the opportunity to provide comments about Wellington North Power. This was free-text so customers could write anything.

Findings:

64 customers (29% of survey respondents) provided comments with their completed surveys. WNP reviewed each comment and grouped it as per table below:



Comment Regarding	**# of Responses**	**%**
No Comment Given	155	71%
Ad-Hoc	3	1%
Better Communication	2	1%
Credit Control	2	1%
Green Energy / Alternative Sources	3	1%
Hydro Rates	7	3%
Service: Positive Feedback	41	19%
Tree-Trimming	2	1%
Water/Sewer Comments	4	2%
Total	**219**	**100%**

Of those respondents that did provide comments:

- 41 people took the time to provide positive comments about the service they receive from WNP. This included comments about knowledgeable and friendly customer service staff, good response times for power outages and great job at keeping the lights on.
- 7 people provided comments about hydro rates that ranged from keep the rates the same, service fees are too high and why do I pay a service fee for each apartment in a building I own.
- There were 3 ad-hoc comments (ask the meter reader to keep of the lawn; keep local; and customer service hours should be extended).
- There were 3 comments concerning green energy / energy alternatives including building a generator at the dam on a nearby river.

For consideration:

WNP will share the survey results, including customer comments, with employees and directors. This information will assist the LDC with its planning and budget processes as well as determining customers' needs and preferences for today and the future.

Appendix D2. Small Business Customer Survey (2019)

Wellington North Power Inc.

290 Queen Street West, PO Box 359, Mount Forest, ON N0G 2L0
Phone: 519.323.1710 Fax: 519.323.2425

www.wellingtonnorthpower.com E-mail: wnp@wellingtonnorthpower.com
ESA # 7012854

2019/2020 Small Business Customer Survey

Wellington North Power Inc. (WNP) conducted a survey of its Small Business customers (rate-class General Service <50kW). The survey questions were prepared by WNP and were available to customers to complete by:

- Accessing using the LDC's website.
- Accessing on-line through Survey Monkey.
- Available at the office counter for walk-in customers.

Survey Objective

The intent of the survey was to capture customers' feedback to assist WNP with business planning for the period 2021 to 2025. The responses will help provide an insight into the services offered by WNP as well better understand the needs and preferences of our customers.

Survey Questions

Survey questions focused on the following themes:

1. Satisfaction;
2. Rating of Service Provided;
3. Power outages;
4. Effectiveness during an Outage;
5. Company profile;
6. Investment priorities;
7. Price and reliability; and
8. Trust.

The Small Business customer survey ran from October 4th 2019 to January 31st 2020.

Survey Promotion

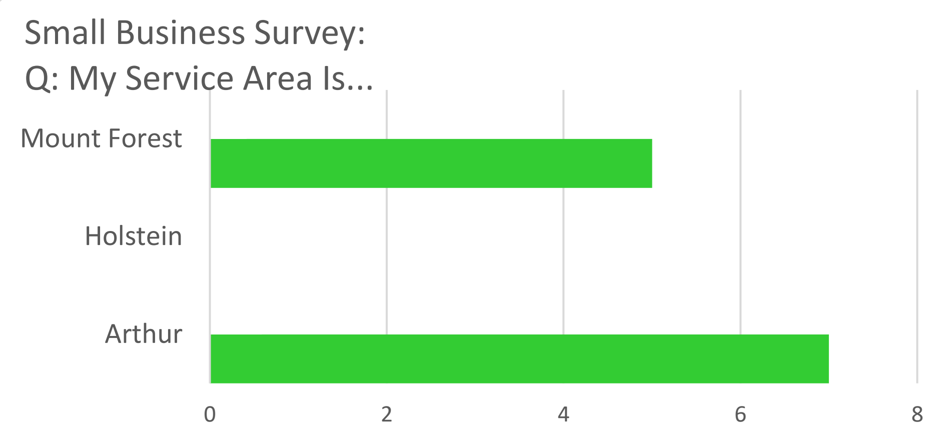
WNP promoted the survey through the following channels:

a) Bill inserts included with October, November and December bills.
b) Messages on customers' e-bill for bills issued in October, November and December.
c) Promoted on Wellington North Power's website.
d) Weekly messages posted on social media (Facebook and Twitter).
e) Walk-in customer visits to the LDC's office.
f) Notices posted at the Arthur Chamber of Commerce.

Survey Reponses

WNP received survey responses from only 12 Small Business customers. With 476 Small Business accounts as at December 31st 2019 this represents a 3% response-rate. The LDC acknowledges this response rate is not statistically significant; however the responses do provide valuable feedback to how our customers perceive the services offered by Wellington North Power and assist in preparing capital plans and operating budgets.

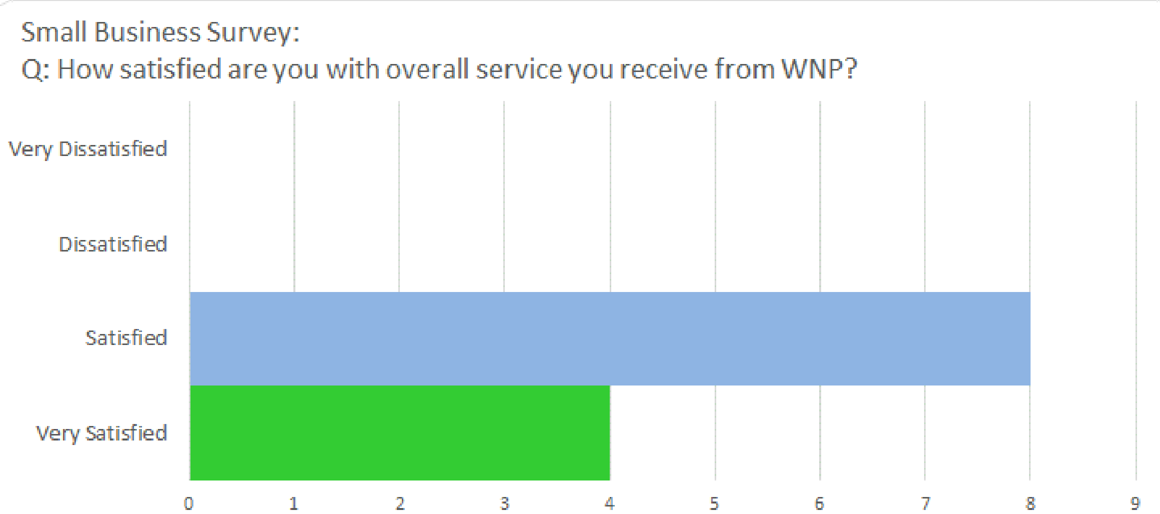
WNP operates within three (3) service areas in Wellington North in the urban centers of Arthur, Holsten and Mount Forest. The chart below shows the survey responses received split by the service area:



	Arthur	Holstein	Mount Forest
% of Total Received	58%	0%	42%
Survey Responses	7	0	5

1. Satisfaction

The chart below summarizes how Small Business respondents rate the overall service provided by WNP:



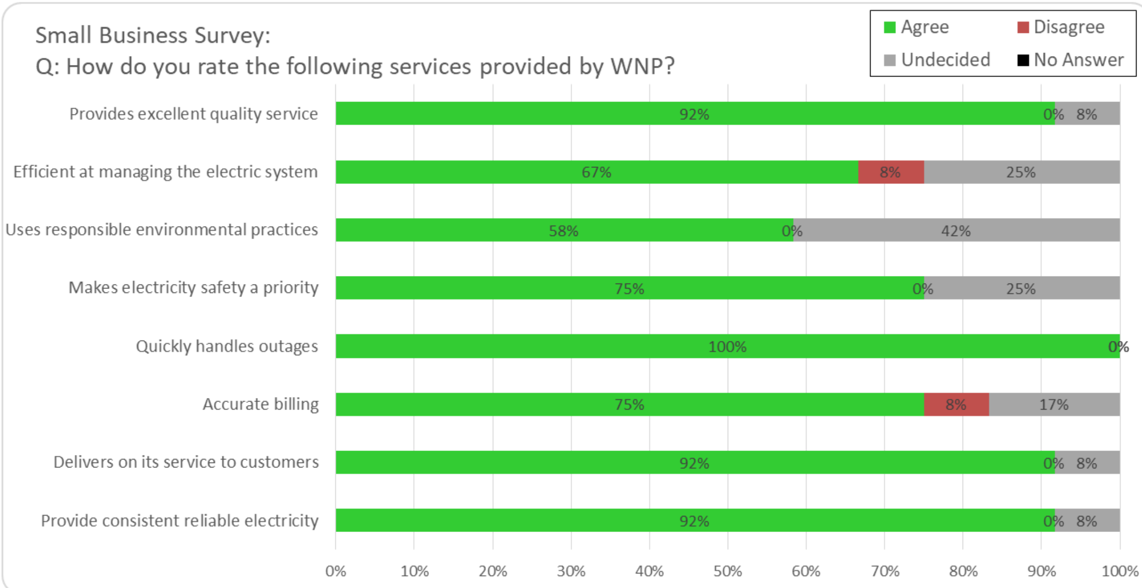
	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
Survey Responses	4	8	0	0

Findings:

- 100% of respondents rated WNP overall service as either "Very Satisfied" or "Satisfied".

2. Service Rating

Customers were given a series of statements and asked if they “Agree”, “Disagree” or were “Undecided” with each statement. The chart below shows the collated responses:



Statement	Agree	Disagree	Undecided	No Answer	Total
Provide consistent reliable electricity	92%	0%	8%	0%	100%
Delivers on its service to customers	92%	0%	8%	0%	100%
Accurate billing	75%	8%	17%	0%	100%
Quickly handles outages	100%	0%	0%	0%	100%
Makes electricity safety a priority	75%	0%	25%	0%	100%
Uses responsible environmental practices	58%	0%	42%	0%	100%
Efficient at managing the electric system	67%	8%	25%	0%	100%
Provides excellent quality service	92%	0%	8%	0%	100%

<u>Findings:</u>

- 100% of respondents agreed that WNP handles power outages quickly.
- 8% (1 respondent) disagreed with the statements that WNP provided accurate billing and the LDC was efficient at managing the electric system.
- Reliability, service delivery and quality of service were all rated as “Agreed” by 92% of the response population (11 respondents).
- Responses for environmental practices, accurate billing, efficiently manages the electric system, and safety as a priority all achieved an “Undecided” response for over 10% of the respondents (i.e. more than 1 respondent).

<u>For consideration:</u>

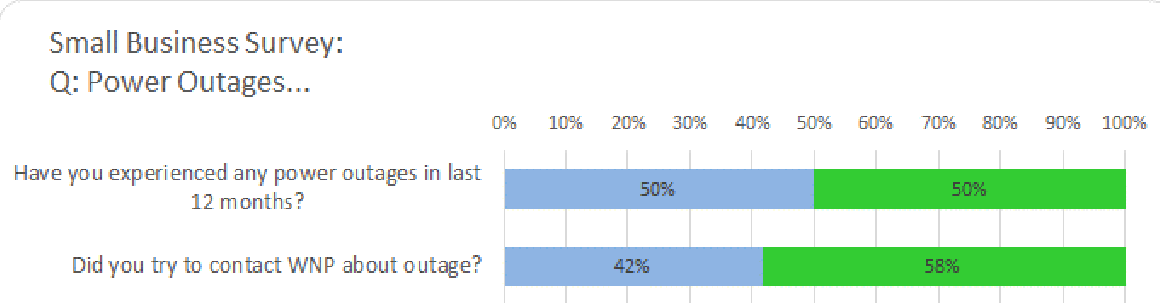
WNP needs to assess how the LDC can better communicate to customers items such as environmental practices and examples of efficient handling of the electricity system. For instance, publishing articles on these items in the local newspaper on a quarterly basis.

3. Power Outages

This question asked if customers had experienced a power outage in the past 12 months and, during the outage, had they tried to contact WNP.

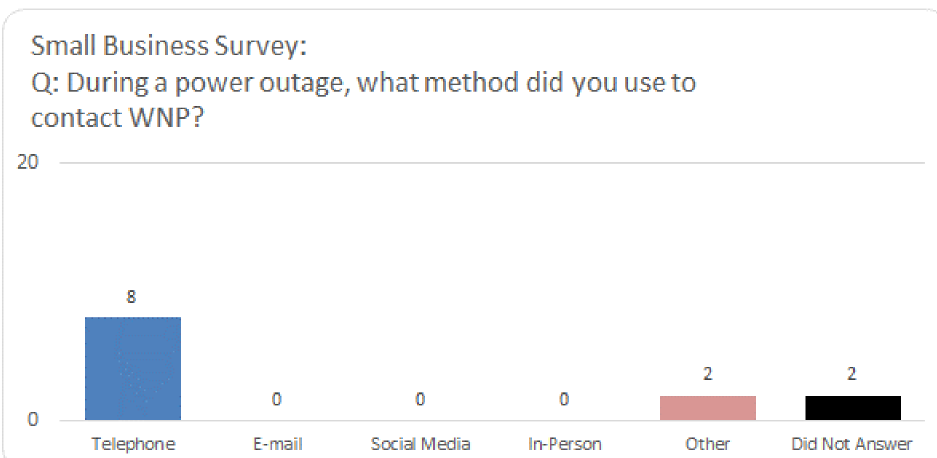
<u>Findings:</u>

50% r of espondents had experienced a power outage during the last 12 months with 42% trying to contact WNP during the outage:



	Did you try to contact WNP about outage?	Have you experienced any power outages in last 12 months?
Yes	42%	50%
No	58%	50%
No Answer	0%	0%

During an outage, 8 respondents (67% of the survey population) tried to contact WNP using the telephone whilst 2 people (16%) used an "Other" method of communication:



During business hours, all telephone calls to WNP are live-answered by a Customer Service Representative. The LDC's office has a back-up generator that means that telephone equipment and customer-service systems are not affected during an outage. Outside of business hours, telephone calls are managed by third-party after-hours service provider, who will forward emergency messages to the On-Call line-men during a power outage.

WNP updates its website with power outage information (such as areas affected, current status and restoration times if known.) The LDC also posts the same information on social media sites (Facebook and Twitter).

<u>For consideration:</u>

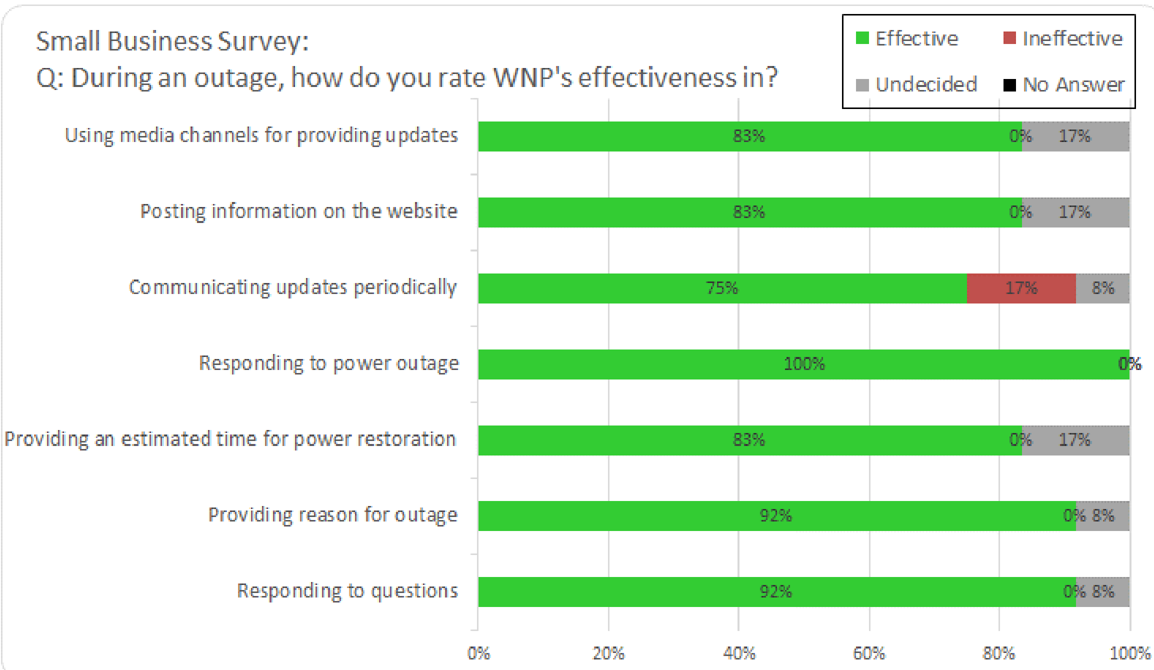
It would be interesting to know what the "Other" communication method is that 2 respondents have used; maybe, in future surveys, this question needs to include "open-text" for customers to name their communication method or preference.

4. Effectiveness during an Outage

This question asked, during an outage, how effective WNP was not only in responding to the outage but also providing information to customers. Against a seven of statements, customers could select “Effective”, “Ineffective” or “Undecided”.

Findings:

- 100% of respondents agreed that WNP is effective in responding to power outages
- The lowest score related to 75% of respondents rating WNP being effective in communicating updates periodically. And, 17% (2 respondents) rated WNP as being ineffective for this statement.
- The remaining statements all scored favourable with 83%+ of respondents rating WNP being effective in these areas.



For information:

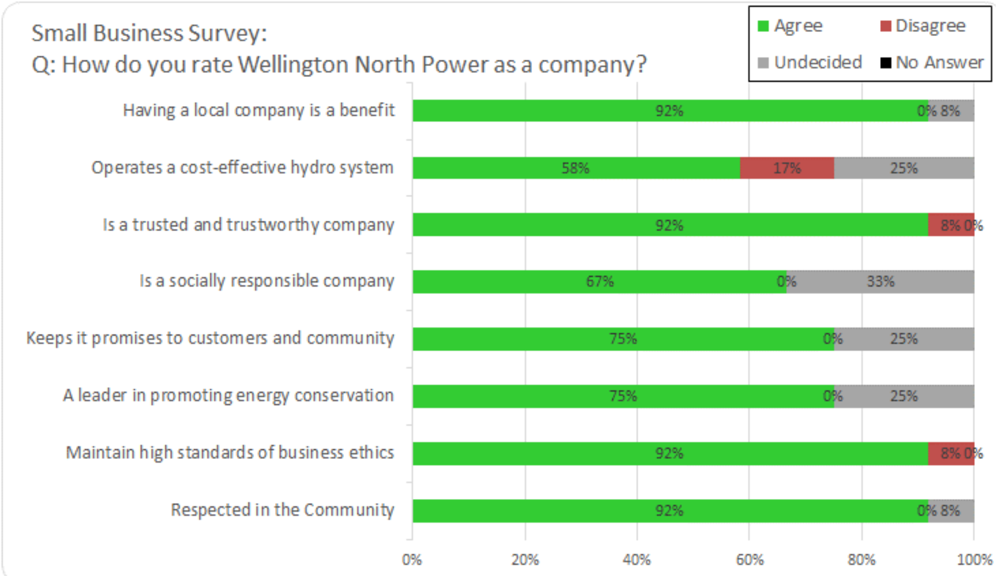
During an outage, WNP posts the information on its social media pages and website. WNP’s website will also show a notice advising there is an outage, where the outage is (i.e. naming the urban area of Arthur, Holstein or Mount Forest) as well as the social media thread conversation. WNP communicates information typically on an hourly basis unless there is no factual information to share (e.g. a restoration time). As the LDC is embedded, it is often reliant on Hydro One passing along information that WNP can share with its customers. WNP is careful what information it shares with customers as we do not want to share incorrect or unconfirmed information.

For consideration:

Perhaps WNP should consider posting information every 30 minutes during an outage, even if it is to advise the outage is still on-going and crews are still assessing.

5. Company Profile

This question considered how customers felt about WNP. Customers were provided with a series of statements enabling respondents to choose either “Agree”, “Disagree” or “Undecided” with each statement. The chart below shows the collated responses:



Findings:

Statement	Agree	Disagree	Undecided	No Answer
Respected in the Community	92%	0%	8%	0%
Maintain high standards of business ethics	92%	8%	0%	0%
A leader in promoting energy conservation	75%	0%	25%	0%
Keeps it promises to customers and community	75%	0%	25%	0%
Is a socially responsible company	67%	0%	33%	0%
Is a trusted and trustworthy company	92%	8%	0%	0%
Operates a cost-effective hydro system	58%	17%	25%	0%
Having a local company is a benefit	92%	0%	8%	0%

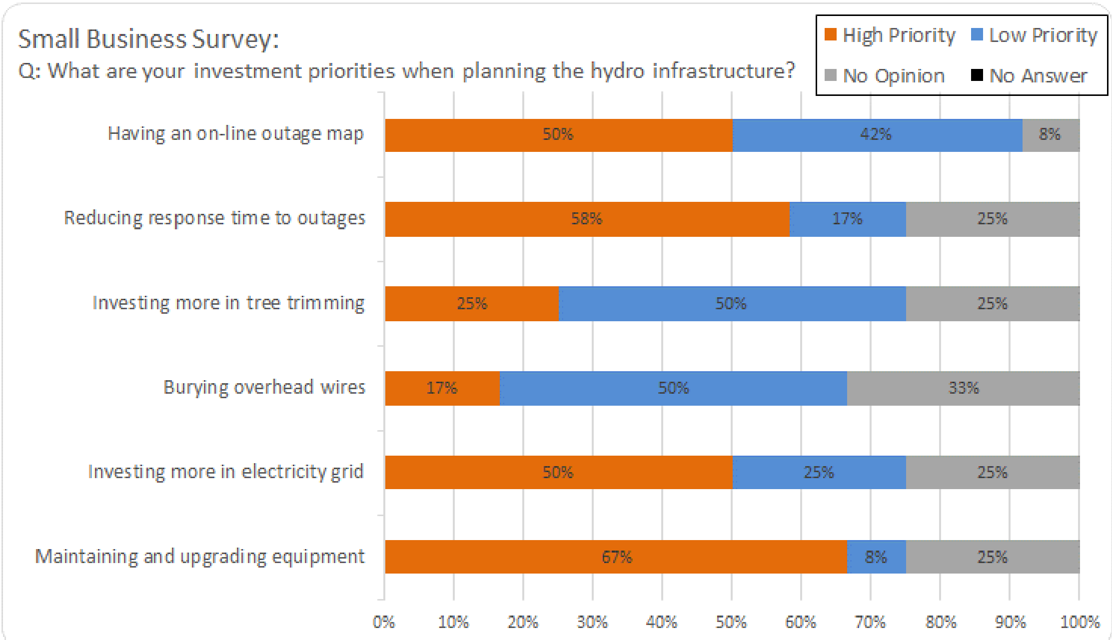
- 92% of the survey population agreed that WNP is a trusted company, is respected in the community and has high standards of business ethics.
- 58% of the survey population agreed WNP operates a cost-effective hydro system. For this statement, 25% of respondents were “undecided” and 17% (2 people) “disagreed”.
- As a leader in promoting energy conservation, 75% agreed with this statement; however 25% were undecided. In March 2019 the government announced that energy conservation was to be centrally-delivered by the IESO, rather than by LDCs. Although WNP supports energy conservation, from March 2019, the LDC has reduced its’ efforts in promoting energy conservation (i.e. less social-media posting about energy savings programs and no hosting of CDM stands at local community events).

For consideration:

a) An article in the local newspaper each quarter about capital projects completed and future plans which could make reference to being social-responsible (i.e. safe disposal of oil-filled transformers).
b) An annual meeting for small business customers, held in the evening after business hours to present proposed operating budgets and capital investment plans. This may help inform our customers about what options were explored, why investment is needed and how the LDC is being cost-effective for stakeholders’ needs today and for the future.
c) Present information at Chamber of Commerce meetings.

6. Investment Priorities

This question sought customers' opinions about how WNP should invest. Customers were provided with a series of statements enabling respondents to choose either "High Priority", "Low Priority" or "No Opinion" with each statement. The chart below shows the collated responses:



<u>Findings:</u>

Statement	High Priority	Low Priority	No Opinion	No Answer
Maintaining and upgrading equipment	67%	8%	25%	0%
Investing more in electricity grid	50%	25%	25%	0%
Burying overhead wires	17%	50%	33%	0%
Investing more in tree trimming	25%	50%	25%	0%
Reducing response time to outages	58%	17%	25%	0%
Having an on-line outage map	50%	42%	8%	0%

- "Maintaining and upgrading equipment" was the most popular "high priority" of all the statements provided. 67% of the survey population rated this as a high priority whereas 8% rated it as "low priority". (25% or 3 respondents had no opinion about this item).
- "Burying overhead wires" was the lowest "high priority" as rated by 17% of the respondents.
- "Reducing response time to power outages" was the 2nd highest priority with 58% of respondents rating this as a high priority item.

<u>For consideration:</u>

Respondents rated "maintaining and upgrading equipment" as the highest priority of all the statements. WNP needs to continue with its capital investment that maintains the reliability of the distribution system at a pace that does not excessively increase hydro-rates year-over year. Capital investment planning is through good asset condition assessment programs that will assist in making informed asset replacement priority decisions.

7. Price and Reliability

This question asked customers to rate five statements from 1 being most important to 5 being of least important to them. The statements were:

a) Pay lower electricity rates with reduced reliability.
b) Pay higher electricity rates with increased reliability.
c) Increase spending to accommodate grid modernization.
d) Pay higher electricity rates to pay for burying cables.
e) Continue with current investment spending levels to balance electricity reliability and rates.

Findings:

The table below shows the results as a percentage of all responses received:

Statement	Most Important 1	2	3	4	Least Important 5	No Answer	Total
Pay lower electricity rates with reduced reliability	25%	8%	42%	8%	17%	0%	100%
Pay higher electricity rates with increased reliability	0%	8%	42%	33%	17%	0%	100%
Increase spending to accommodate grid modernization	8%	25%	42%	17%	8%	0%	100%
Pay higher electricity rates to pay for burying cables	0%	0%	17%	33%	50%	0%	100%
Continue with current investment spending levels to balance electricity reliability and rates	42%	17%	17%	25%	0%	0%	100%

The table below shows the results by the number of survey respondents:

Statement	Most Important 1	2	3	4	Least Important 5	No Answer	Total
Pay lower electricity rates with reduced reliability	3	1	5	1	2	0	12
Pay higher electricity rates with increased reliability	0	1	5	4	2	0	12
Increase spending to accommodate grid modernization	1	3	5	2	1	0	12
Pay higher electricity rates to pay for burying cables	0	0	2	4	6	0	12
Continue with current investment spending levels to balance electricity reliability and rates	5	2	2	3	0	0	12

- "Continue with current investment spending levels to balance electricity reliability and rates" statement was ranked as the highest "most important" score of all statements (rated as high important by 42% of respondents).
- "Pay higher electricity rates to pay for burying cables" was rated as the "least important" statement with 50% of respondents scoring this with a "5".
- Slightly more people rated paying "lower electricity rates with reduced reliability" as a higher important priority compared to those that scored it as a most important (i.e. 25% compared to 17%); however 42% (5 respondents) rated this statement with neutral importance (i.e. a rating of 3).

For consideration:

In preparing its capital plans and setting operating budgets, based upon the survey result, WNP should continue with current investment spending levels to balance electricity reliability and rates.

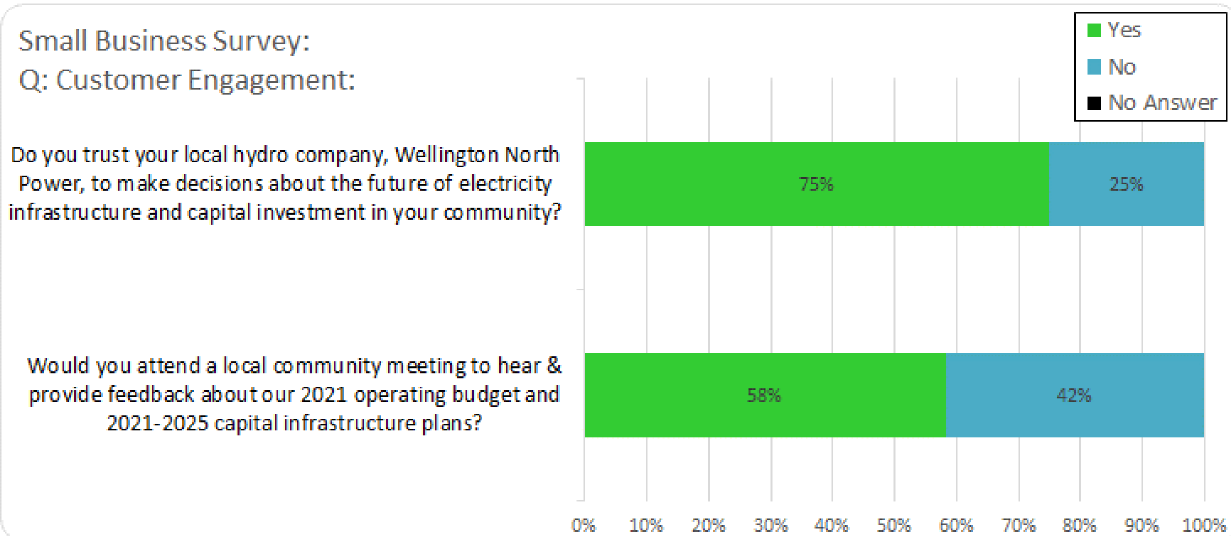
8. Trust

This question asked if WNP's customers:

a) Trusted their local hydro company to make decisions about electricity infrastructure and capital investments.
b) Interested in attending a community open house to provide feedback concerning WNP's 2021 operating budget and 5-year capital investment plan for 2021-2025.

Findings:

- 75% of respondents did trust their local hydro company, WNP, to make decisions concerning the electricity infrastructure.
- 58% of respondents (9 out of 12 responses) would be interested in attending a community meeting.



For consideration:

WNP appreciates and acknowledges the trust bestowed on the LDC by its customers. Wellington North Power Inc. has been serving the community for over 100 years and is committed to continuing to provide outstanding service to its customers and stakeholders.

Given the response from the Small Business customers who participated in the survey, WNP should consider hosting a community meeting to enable customers to hear about and be involved in WNP's 2021 operating budget and capital investment plans.

For consideration:

WNP will share the survey results, including customer comments, with employees and directors. This information will assist the LDC with its planning and budget processes as well as determining customers' needs and preferences for today and the future.

Appendix D3. Industrial & Commercial Customer Survey (2019)

Wellington North Power Inc.
290 Queen Street West, PO Box 359, Mount Forest, ON N0G 2L0
Phone: 519.323.1710 Fax: 519.323.2425
www.wellingtonnorthpower.com E-mail: wnp@wellingtonnorthpower.com
ESA # 7012854

2019 Industrial & Commercial Customer Survey

In Quarter 4 2019, Wellington North Power Inc. (WNP) conducted a survey of its Industrial and Commercial (I&C) customers, i.e. those customers in the customer rate class of General Service 1,000 to 4,999kW.

The survey questions were prepared by WNP and were e-mailed to I&C customers. Customers completed the survey and e-mailed their responses to WNP.

Survey Objective

The intent of the survey was to capture customers' feedback to assist WNP with business planning for the period 2021 to 2025. The responses will help provide an insight into the services offered by WNP as well better understand the needs and preferences of our customers.

Survey Questions

Survey questions focused on the following themes:

1. Satisfaction;
2. Rating of Service Provided;
3. Power outages;
4. Effectiveness during an Outage;
5. Company profile;
6. Investment priorities;
7. Price and reliability; and
8. Trust.

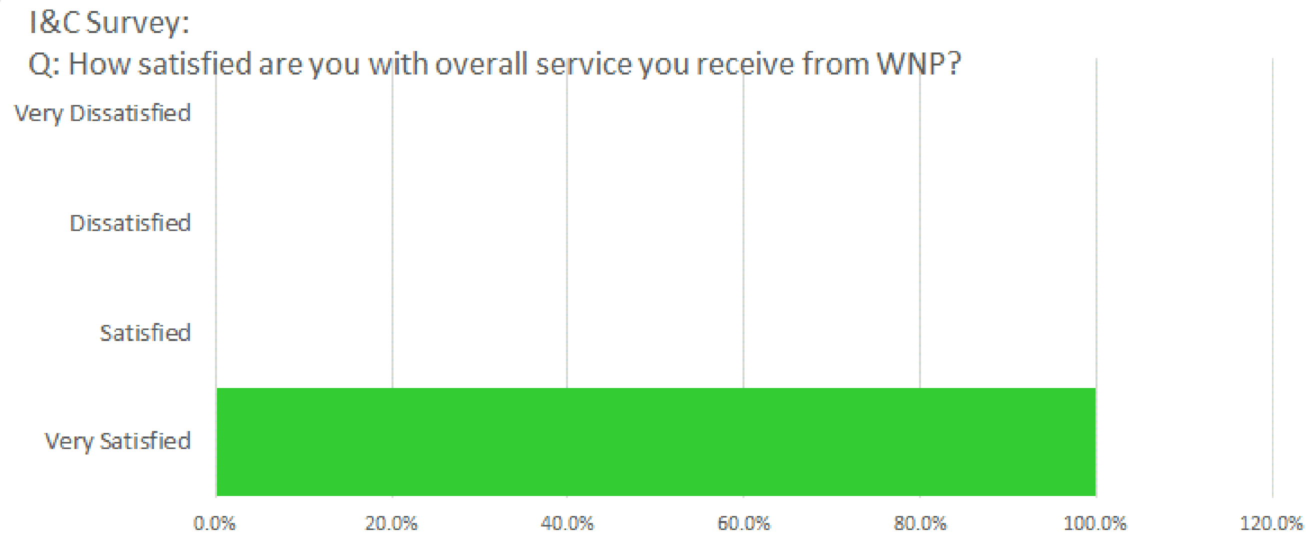
Survey Reponses

WNP has four I&C customers accounting for five accounts in customer rate class General Service 1,000 to 4,999kW. In 2019, these four customers accounted for approximately 43% of all electricity consumed by WNP customers.

Three of the four (75%) I& C customers submitted survey responses. (The fourth customer did not complete a survey although WNP did follow-up several times.) The LDC acknowledges the small survey group of four customers; however the responses do provide valuable feedback to how our larger customers perceive the services offered by Wellington North Power and assist in preparing capital plans and operating budgets.

1. Satisfaction

The chart below summarizes how I&C customers rate the overall service provided by WNP:



	Very Satisfied	Satisfied	Dissatisfied	Very Dissatisfied
% of Total Received	100.0%	0.0%	0.0%	0.0%

Findings:

- All 3 customers rated WNP's overall service as "Very Satisfied".

For consideration:

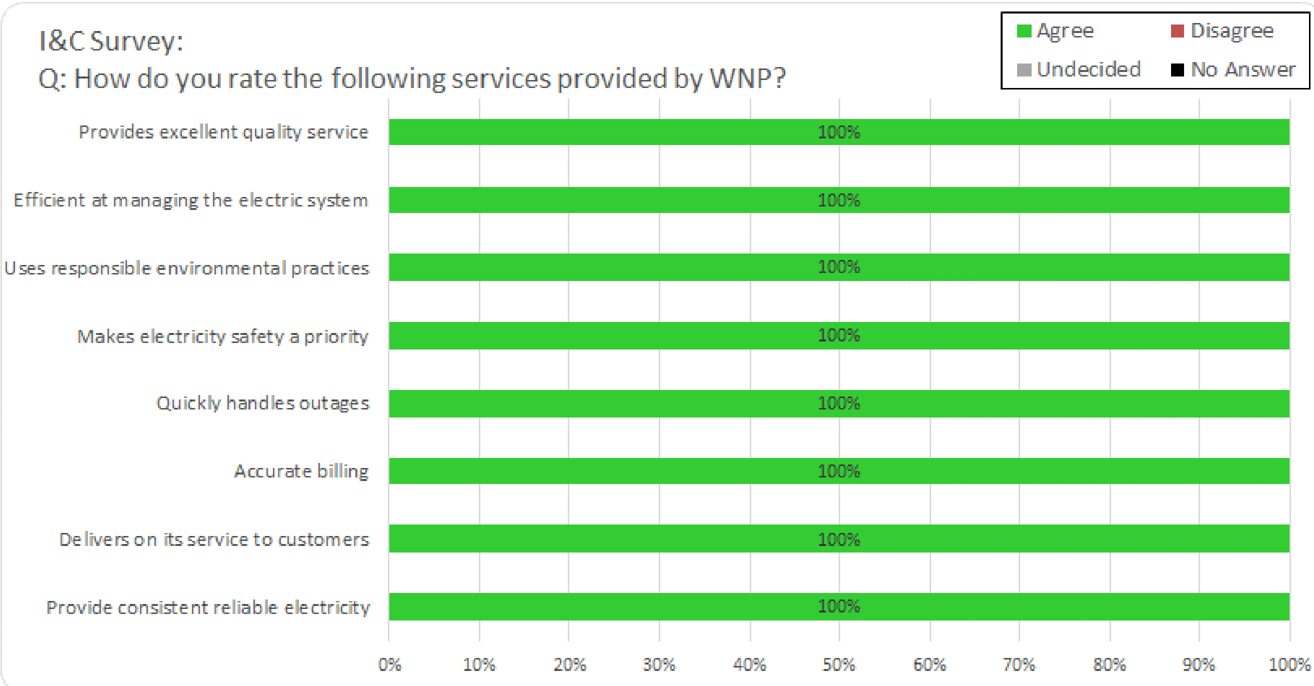
These customers are dependent on a reliable electricity supply to maintain their day-to-day operations. WNP has worked hard to forge good relationships with these customers which have included:

- Advanced notice of planned power outages;
- Meetings to address bill or payment queries and discuss industry items such as Class A ICI participation;
- Meetings with engineers and plant managers to discuss voltage concerns, plant expansion plans and conservation programs;
- Cell and e-mail contact details for WNP's CEO/President.

WNP will continue to work hard in maintaining the relationships with I&C customers.

2. Service Rating

Customers were given a series of statements and asked if they “Agree”, “Disagree” or were “Undecided” with each statement. The chart below shows the collated responses:



Statement	Agree	Disagree	Undecided	No Answer	Total
Provide consistent reliable electricity	100.0%	0.0%	0.0%	0.0%	100%
Delivers on its service to customers	100.0%	0.0%	0.0%	0.0%	100%
Accurate billing	100.0%	0.0%	0.0%	0.0%	100%
Quickly handles outages	100.0%	0.0%	0.0%	0.0%	100%
Makes electricity safety a priority	100.0%	0.0%	0.0%	0.0%	100%
Uses responsible environmental practices	100.0%	0.0%	0.0%	0.0%	100%
Efficient at managing the electric system	100.0%	0.0%	0.0%	0.0%	100%
Provides excellent quality service	100.0%	0.0%	0.0%	0.0%	100%

Findings:

- All customers who responded rated “Agree” for all eight statements. A rating of “Agree” denotes that I&C customers have a positive experience of the services provided by WNP.

For consideration:

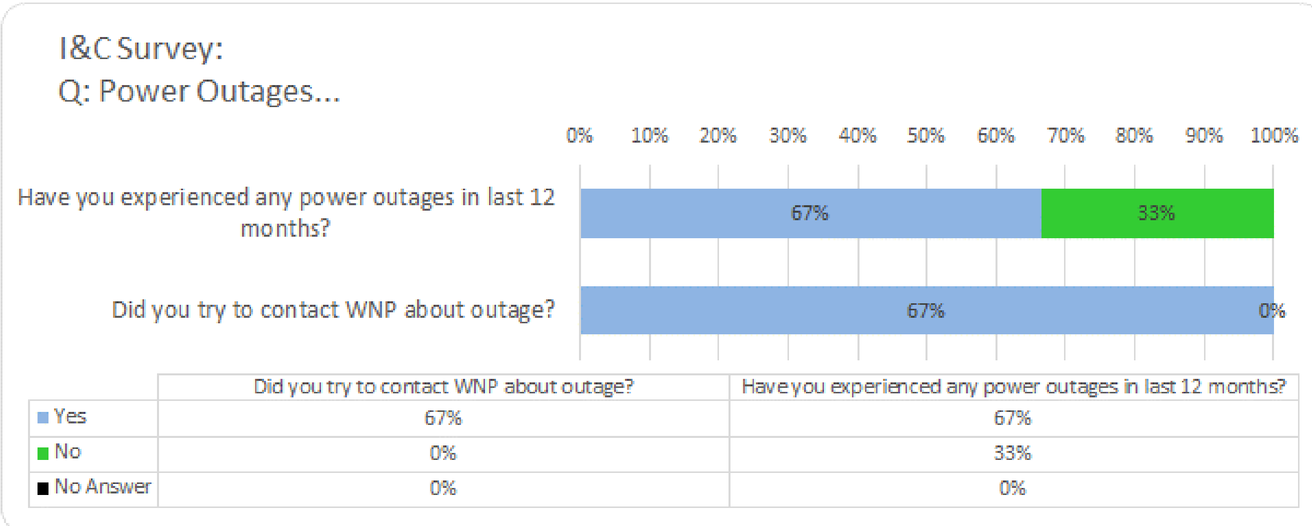
WNP will continue to work hard in maintaining the relationships with I&C customers.

3. Power Outages

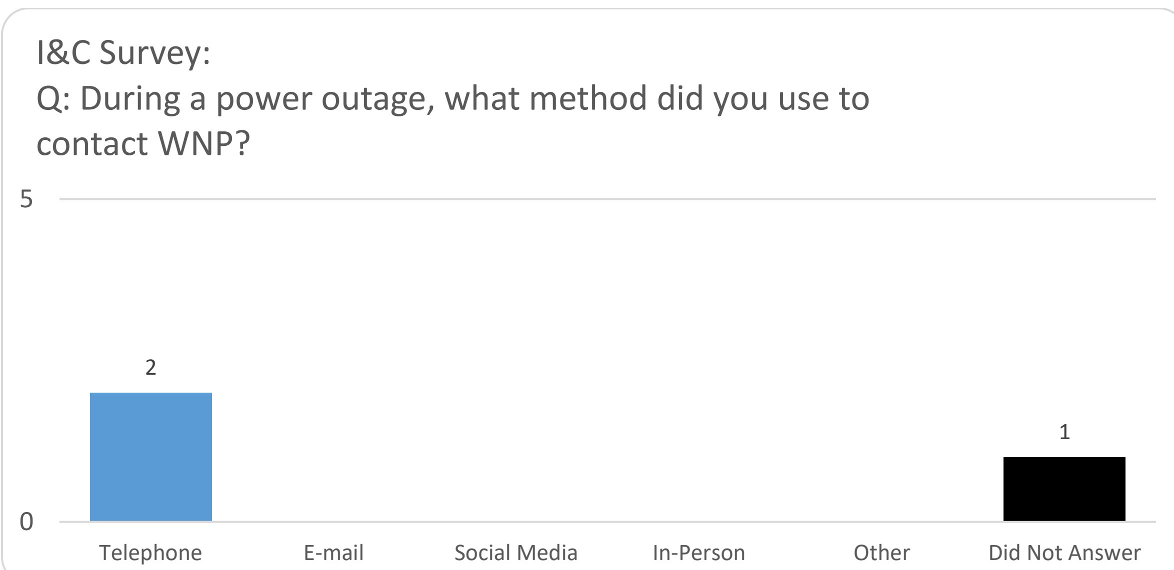
This question asked if customers had experienced a power outage in the past 12 months and, during the outage, had they tried to contact WNP.

<u>Findings:</u>

67% respondents had experienced a power outage during the last 12 months with 67% trying to contact WNP during the outage:



The respondents who did try to contact WNP during an outage used the telephone as their communication method:



WNP's CEO/President has forged good relationships with I&C customers. During outages, I&C customers contact the CEO/President on his cell phone or by e-mail for updates about causes and restoration times. I&C customers need reliable and updated information to make decisions which may include plant shutdown.

<u>For consideration:</u>

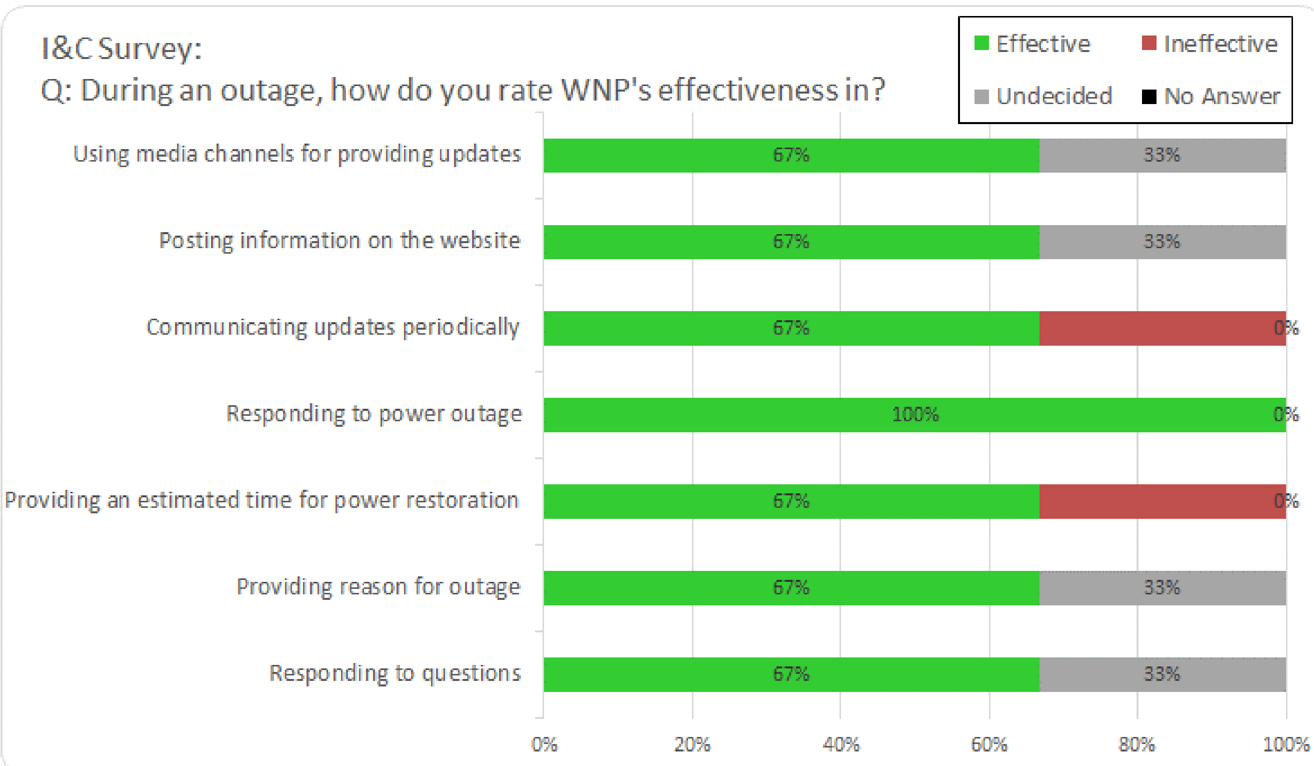
WNP will continue to work hard in maintaining the relationships with I&C customers.

4. Effectiveness during an Outage

This question asked, during an outage, how effective WNP was not only in responding to the outage but also providing information to customers. Against a seven of statements, customers could select “Effective”, “Ineffective” or “Undecided”.

Findings:

- All respondents agreed that WNP is effective in responding to power outages
- 1 customer rates WNP as “Ineffective” for (a) communicating updates periodically and (b) providing estimated restoration times.



For consideration:

Perhaps WNP should explore an outage management tool that provides I&C customers with current and appropriate information to help the customer help-themselves, rather than wait for a return call or e-mail from the CEO/President?

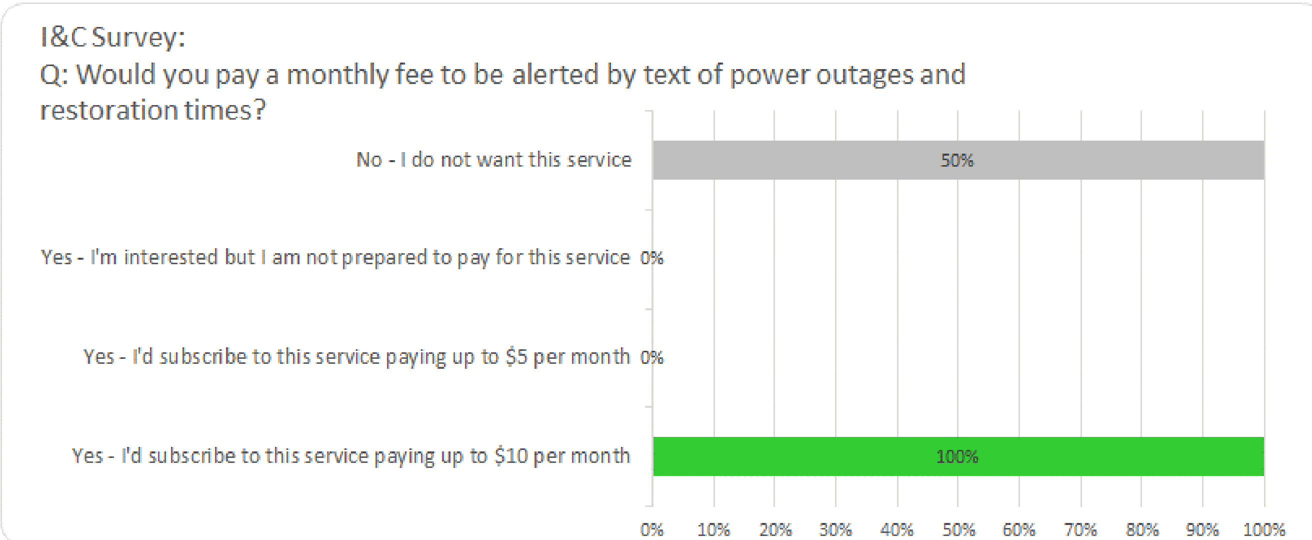
Power Outage Text Service

The I&C survey included a question asking customers:

"Would you pay a monthly fee to be alerted by test of power outages and restoration times?"

Findings:

- Two customers responded they would like this service and would pay a monthly subscription fee of up to $10.
- One customer did not want this service.

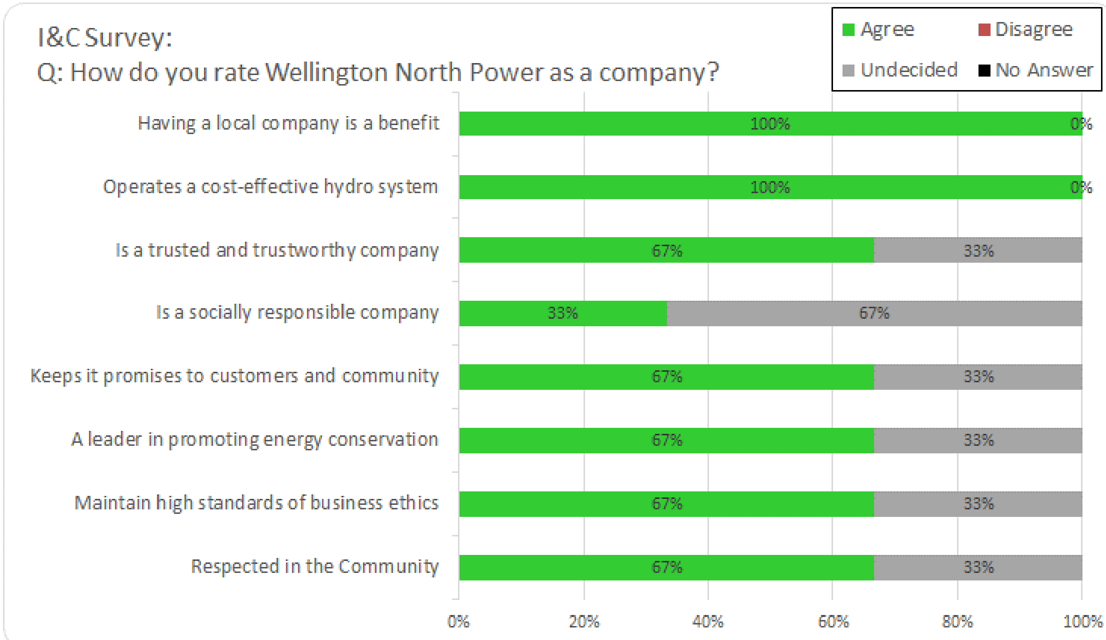


For consideration:

Given that 2 out of 3 I&C customers (67%) indicated they wanted a text service alerting them of a power outage and when power had been restored, WNP should quantify if non I&C business customers would also subscribe to this service and be willing to pay for it. This opportunity should be explored if there is customer demand for this service.

5. Company Profile

This question considered how customers felt about WNP. Customers were provided with a series of statements enabling respondents to choose either "Agree", "Disagree" or "Undecided" with each statement. The chart below shows the collated responses:



<u>Findings:</u>

Statement	Agree	Disagree	Undecided	No Answer
Respected in the Community	67%	0%	33%	0%
Maintain high standards of business ethics	67%	0%	33%	0%
A leader in promoting energy conservation	67%	0%	33%	0%
Keeps it promises to customers and community	67%	0%	33%	0%
Is a socially responsible company	33%	0%	67%	0%
Is a trusted and trustworthy company	67%	0%	33%	0%
Operates a cost-effective hydro system	100%	0%	0%	0%
Having a local company is a benefit	100%	0%	0%	0%

- 67% of the survey population (2 respondents of 3) agreed that WNP is a trusted company.
- 67% of the survey population agreed that WNP is respected in the community and 67% also agreed the LDC has high standards of business ethics.
- 100% of the survey population (146 respondents) agreed WNP operates a cost-effective hydro system.
- "Is a socially responsible company" statement was rated as "Undecided" by 67% of I&C customers.

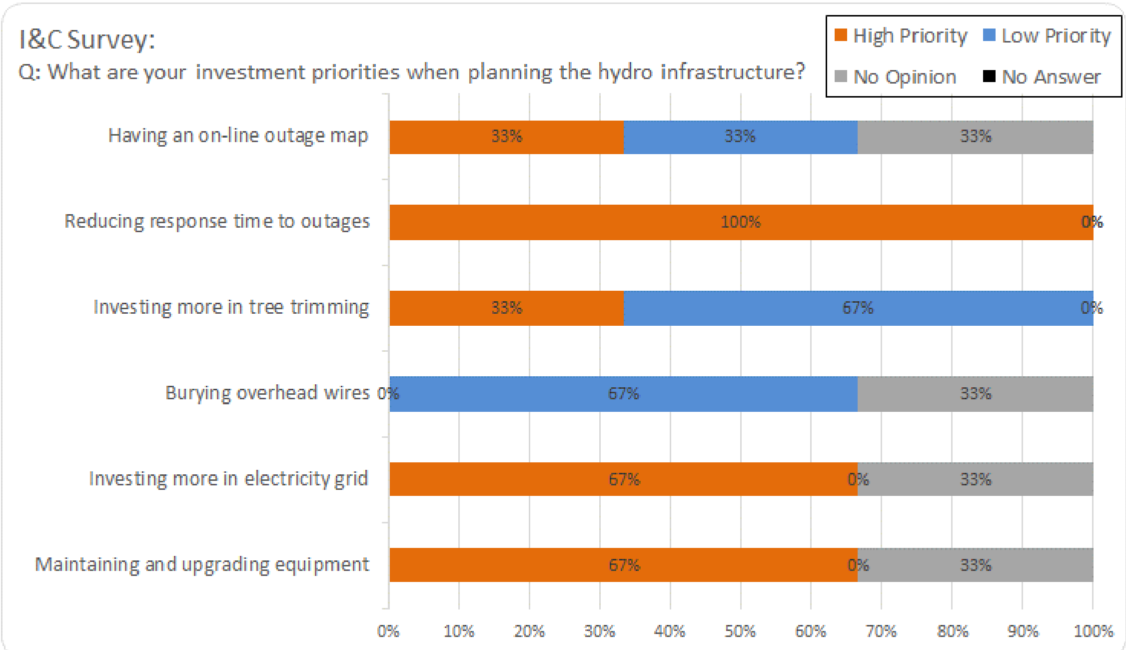
<u>For consideration:</u>

From the survey results, the LDC needs to consider:

a) An article in the local newspaper each quarter about capital projects completed and future plans which could make reference to being social-responsible (i.e. safe disposal of oil-filled transformers).
b) Annual breakfast business meetings to present proposed operating budgets and capital investment plans to help inform I&C customers about what options were explored, why investment is needed and how the LDC is being cost-effective for stakeholders' needs today and for the future.

6. Investment Priorities

This question sought customers' opinions about how WNP should invest. Customers were provided with a series of statements enabling respondents to choose either "High Priority", "Low Priority" or "No Opinion" with each statement. The chart below shows the collated responses:



Findings:

Statement	High Priority	Low Priority	No Opinion	No Answer
Maintaining and upgrading equipment	67%	0%	33%	0%
Investing more in electricity grid	67%	0%	33%	0%
Burying overhead wires	0%	67%	33%	0%
Investing more in tree trimming	33%	67%	0%	0%
Reducing response time to outages	100%	0%	0%	0%
Having an on-line outage map	33%	33%	33%	0%

- "Reducing response times to outages" was the most popular "high priority" of all the statements provided.
- "Burying overhead wires" was the lowest "high priority" as rated by none of the respondents.
- Of all the statements, "Having an on-line outage map" achieved the most varied response with respondents equally rating this statement as a high priority, a low priority or no opinion.

For consideration:

As mentioned previously, I&C customers are reliant upon having a reliable power source to operate their facility. Outages can lead to shifts being cancelled and even plant closure until power is restored. WNP is not surprised that "reducing response times to outages" was the highest priority of I&C customers.

7. Price and Reliability

This question asked customers to rate five statements from 1 being most important to them to 5 being of least important. The statements were:

a) Pay lower electricity rates with reduced reliability.
b) Pay higher electricity rates with increased reliability.
c) Increase spending to accommodate grid modernization.
d) Pay higher electricity rates to pay for burying cables.
e) Continue with current investment spending levels to balance electricity reliability and rates.

Findings:

The table below shows the results as a percentage of all responses received:

Statement	1 (Most Important)	2	3	4	5 (Least Important)	No Answer	Total
Pay lower electricity rates with reduced reliability	0%	0%	0%	0%	100%	0%	100%
Pay higher electricity rates with increased reliability	0%	33%	33%	0%	33%	0%	100%
Increase spending to accommodate grid modernization	0%	33%	67%	0%	0%	0%	100%
Pay higher electricity rates to pay for burying cables	0%	0%	0%	33%	67%	0%	100%
Continue with current investment spending levels to balance electricity reliability and rates	33%	33%	33%	0%	0%	0%	100%

The table below shows the results by the number of survey respondents:

Statement	1 (Most Important)	2	3	4	5 (Least Important)	No Answer	Total
Pay lower electricity rates with reduced reliability					3		3
Pay higher electricity rates with increased reliability		1	1		1		3
Increase spending to accommodate grid modernization		1	2				3
Pay higher electricity rates to pay for burying cables				1	2		3
Continue with current investment spending levels to balance electricity reliability and rates	1	1	1				3

- "Continue with current investment spending levels to balance electricity reliability and rates" statement was ranked as the highest "most important" score of all statements.
- "Increase spending to accommodate grid modernization" was the highest neutral statement with 67% of respondents scoring this a "3" (i.e. neither important nor not important).
- "Pay lower electricity rates with reduced reliability" was rated as the "least important" statement as all respondents the scored this with a "5".

For consideration:

In preparing its capital plans and setting operating budgets, based upon the survey result, WNP should continue with current investment spending levels to balance electricity reliability and rates.

Next Steps:

WNP will share the survey results, including customer comments, with employees and directors. This information will assist the LDC with its planning and budget processes as well as determining customers' needs and preferences for today and the future.

APPENDIX 2B – CAPITALIZATION POLICY

Wellington North Power Inc.
Policy & Procedures

3510 Capitalization Policy		
Date: January 7, 2019	Revision#: 5	Page **1** of **5**

1 PURPOSE:

1.1. The purpose of this policy is to describe the specific criteria used to determine if expenditures should either be capitalized on the Balance Sheet or expensed to Operations or Administration general ledger accounts in the period incurred.

2 SCOPE:

2.1 This policy applies to:

a) Assets including property, land, equipment, materials, inventory, computer hardware, computer software, computer licences; and

b) Third-party reports and/or supporting studies as purchased by Wellington North Power Inc.

2.2 This policy applies to the treatment of labour costs and contractor costs associated with the installation and/or testing of assets / equipment.

2.3 This policy applies to the treatment of truck costs associated with the installation of assets / equipment.

2.4 This policy applies to employees involved in the activities of purchasing assets, recording of capital equipment transactions and maintaining capital asset general ledger accounts as well as Management at Wellington North Power Inc.

3 DEFINITIONS:

3.1 **Tangible Assets**: Property, plant and equipment are identified as tangible assets provided they are held for use in the production or supply of goods and services, are intended for the continuing use, and are not intended for sale in the ordinary course of business.

3.2 **Intangible Assets:** An intangible asset is a right or non-physical resource that provides a benefit or advantage to the company**.**

3.3 **Goodwill:** An asset acquired for the cost over and above the net amount of the acquired asset value and assumed liability, the excess cost is considered goodwill**.**

3.4 **Capital Assets:** Capital assets include tangible and intangible assets, exclusive of goodwill.

3.5 **Betterment:** Betterment is a cost that is incurred to enhance the service potential of a capital asset. Expenditures for betterments are capitalized. This enhancement in service potential can include an increase in the physical output or service capacity, decrease in associated operation costs, extension in the useful life of the asset, or improvement in the quality of the asset's output.

3.6 **Repair:** A repair is a cost incurred to maintain the existing service potential of a capital asset. Expenditures for repairs are expensed in the period in which they occur.

3.7 **Development:** The development of an asset includes work to prepare an asset for further capital work and would typically include development of a piece of land for construction of a Substation or other distribution plant.

If the associated project is not completed with an asset put into service, these costs are expensed.

3.8 **Materiality:** All expenditures for capital assets and betterments will be capitalized subject to materiality limits as set out in this policy. At times the administrative cost of capitalizing an asset may outweigh the intended benefits.

While an expenditure may meet the definition to qualify as a capital asset, a dollar level is also set, known as a "Materiality Limit". Should the expenditure fall below this limit, then it is not capitalized.

3.9 **Materiality Limit**: For assets, the materiality value for capitalization of new assets or addition to existing assets will be a minimum of $500.00 (before tax) for both distribution plant and general plant. The asset is assigned a unique property number and recorded in the company's asset module.

Where programs are established for ongoing betterment work, the minimum "Material Limit" will not be applicable.

3.10 **Readily Identifiable Assets (Discrete):** A discrete capital asset has a cost over $500.00 (before tax) and is identifiable in the company's asset management module to ensure individual tracking and record keeping.

3.11 **IFRS:** International Financial Reporting Standards (IFRS) is set of accounting standards developed by an independent, not-for-profit organization called the International Accounting Standards Board (IASB).

The objective of IFRS is to develop a single set of high quality, understandable, enforceable and globally accepted financial reporting standards based upon clearly articulated principles and to promote the use and rigorous application of those standards.

3.12 **Amortization:** As of January 1, 2012 Wellington North Power Inc. adopted the “Typical Useful Life (TUL)” depreciation rates set out in the Kinectrics Inc. Report No: K-418033-RA-001-R000 prepared for the Ontario Energy Board July 8, 2010.

3.13 **Capitalization Costs:** Cost is the dollar amount to acquire, construct, develop or better a capital asset. Costs include all expenditures necessary to put a capital asset into service, including all overhead costs that are eligible under this policy and an “Allowance for Funds Used During Construction” (AFUDC) if applicable.

Overhead costs must be directly attributable to capital construction activity at Wellington North Power Inc. This is interpreted to mean that the overhead costs to be charged to capital are those that would not exist if the company did not construct its own capital asset.

Overhead burdens that are capitalized include salary and benefits, directly attributable to construction and engineering personnel only, by payroll allocation for capital projects.

3.14 **Capital Related Overhead Expenses:** As per Cost Allocation Procedure form managed and maintained by Finance.

3.15 **Capital Stand-by/ Spare Equipment:** Transformers and meters when received from the supplier will be accounted for as inventory. As referenced in Article 410 of the Accounting Procedures Handbook for Electricity Distributors, at the fiscal year-end these assets will be moved to the capital accounts as stand-by equipment, as they form an integral part of the reliability program for the distribution system.

No depreciation will be applied until the assets are in service and fully operational as intended by Wellington North Power Inc.

3.16 **Allowance For Funds Used During Construction:** For projects with construction duration of greater than twelve (12) months, a financing charge may be applied against the project and capitalized. The financing charge will be the Deemed rate set by the Ontario Energy Board (OEB) for Construction Work-in-Progress (C.W.I.P.).

3.17 **Deferred Revenue (*Contributed Capital*):** Certain assets may be acquired or constructed with financial assistance in the form of customer contributions. Under IFRS accounting standards, customer contributions are treated as "Deferred Revenue". This is treated as a liability on the company's balance sheet and is allocated to "Other Income" over the life of the assets purchased.

4 APPLICABLE REGULATIONS / COMPLIANCE:

4.1 International Financial Reporting Standards (IFRS) requirements (2015) and any subsequent revisions approved by the International Accounting Standards Boards.

4.2 Practices as defined by the Canadian Institute of Chartered Accountants (CICA) Handbook.

4.3 Amendments and revisions to the "Typical Useful Life" (TUL) report for distribution equipment and general plant equipment as managed by the energy regulator, the OEB.

4.4 The Ontario Energy Board (OEB) "Accounting Procedures Handbook for Electricity Distributors", effective January 1, 2012 and subsequent revisions.

4.5 The Ontario Energy Board (OEB) Electricity Distribution Rate Handbook (2006) and subsequent revisions.

4.6 Conditions and amendments as applied by Wellington North Power Inc.'s external financial auditor.

5 RESPONSIBILITIES:

5.1 It is the responsibility of employees involved in the activities of purchasing assets, recording of capital equipment transactions and maintaining capital asset general ledger accounts to adhere to this policy.

5.2 It is the CEO/President's responsibility or the Manger of Finance's responsibility to ensure this policy is understood.

6 PROCEDURES:

6.1 Expenditures are capitalized in accordance with the International Financial Reporting Standards (IFRS) as adopted in Canada by Rate Regulated Entities, such as Wellington North Power Inc.

6.2 Capital assets are expected to provide future economic benefits for more than one year.

6.3 Any expenditure that can be identified as directly attributable with the acquisition, construction, development or betterment of an asset should be capitalized and amortized over the useful life of the asset.

6.4 All expenditures for capital assets and betterments will be capitalized subject to a "**Materiality Limit**" – a set dollar value. For assets, the Materiality Value for capitalization of new assets or addition to existing assets will be **$500.00** (*before tax*) for both distribution plant and general plant.

Should the expenditure fall below this limit, then it shall not be capitalized.

6.5 Where capital projects are established for ongoing betterment work, the minimum "Material Limit" will not be applicable.

6.6 For construction projects and asset replacement, the CEO/President will create Capital Jobs in Wellington North Power Inc.'s financial system for asset purchases to be recorded.

6.7 For General Plant equipment (e.g. computer hardware / software) the CEO/President or Manger of Finance will inform Finance to create Capital Jobs in Wellington North Power Inc.'s financial system for asset purchases to be recorded.

6.8 A Capital Job will be created for each project for all materials, labour, truck-time and contractor costs to be recorded and maintained.

6.9 Invoices relating to the purchase of capital assets shall be reviewed and approved by the CEO/President or Manager of Finance in accordance with this policy.

6.10 Finance is responsible for maintaining the company's financial system and asset module.

6.11 Finance is responsible for ensuring the asset module in the financial systems aligns with year-end audited financial statements.

6.12 Finance is responsible for providing Capital Expenditure reporting to Management.