



# EXHIBIT 3

## OPERATING REVENUE

The background of the slide is a photograph of a utility worker in a yellow hard hat and safety vest, working on a wooden utility pole. The worker is in a bucket, and a crane arm is visible on the left. The image has a warm, orange-tinted overlay.

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## EXHIBIT 3: OPERATING REVENUE

### 3.1 LOAD AND REVENUE FORECASTS

This Exhibit provides the details of PUC Distribution Inc.'s ("PUC") operating revenue for 2018 Board Approved, 2018 Actual, 2019 Actual, 2020 Actual, 2021 Actual, the 2022 Bridge Year ("Bridge Year") and the 2023 Test Year ("Test Year"). This Exhibit also provides a detailed variance analysis by rate classification of the operating revenue components. Distribution revenue excludes revenue from commodity sales.

PUC is proposing a total Service Revenue Requirement of \$27,752,199 for the 2023 Test Year. This amount includes a Base Revenue Requirement of \$25,001,934 plus Other Revenue of \$2,750,265.

The following Table 3-1 summarizes PUC's total operating revenue. Revenue for each of the actual years is from PUC's audited financial statements. The Test Year is provided on the basis of both existing and proposed distribution rates. The increase from 2021 actual to 2022 Bridge Year is primarily from the addition of the ICM SSG rate rider and an increase in residential customer count from the load forecast.

**Table 3-1: Summary of Operating Revenue**

	2018 Board Approved	2018 Actual	2019 Actual	2020 Actual	2021 Actual	2022 Bridge	2023 Test at Current Rates	2023 Test at Proposed Rates
<b>Distribution Throughput Revenue</b>								
Residential	11,226,807	9,245,370	11,506,066	11,379,210	11,736,129	12,235,062	12,276,778	15,344,319
General Service <50 kW	3,149,458	2,685,055	3,177,639	2,983,921	3,144,595	3,227,573	3,029,237	3,782,036
General Service 50 to 4,999 kW	4,544,464	4,050,004	4,525,158	4,236,302	4,267,431	4,653,086	4,478,442	5,517,875
Sentinel Lighting	34,742	30,336	34,812	35,057	36,274	35,591	34,786	43,448
Street Lighting	195,345	398,346	192,309	197,592	206,925	211,009	211,009	263,810
Unmetered Scattered Load	39,551	32,133	37,136	37,506	38,751	40,213	40,296	50,446
<b>Total Distribution</b>	<b>19,190,367</b>	<b>16,441,244</b>	<b>19,473,120</b>	<b>18,869,588</b>	<b>19,430,106</b>	<b>20,402,534</b>	<b>20,070,548</b>	<b>25,001,934</b>
LRAMVA		699,556	384,312	-	-			
Tax Change		(179,809)	(786,265)	(252,068)	15			
ICM Sub 16	-	-	-	-	269,820	235,047	231,297	
ICM SSG						862,560	848,733	
Foregone Revenue IRM				192,400				
Lost Revenue COVID				222,316	(222,316)			
<b>Total</b>	<b>19,190,367</b>	<b>16,960,991</b>	<b>19,071,168</b>	<b>19,032,237</b>	<b>19,477,625</b>	<b>21,432,941</b>	<b>21,083,379</b>	<b>25,001,934</b>
Late Payment Charges	259,000	221,084	173,679	296,114	292,124	220,000	230,292	230,292
Miscellaneous Service Revenue	170,100	193,432	161,185	128,942	203,119	152,700	155,754	155,754
Other Operating Revenues	2,216,297	2,040,128	2,271,709	2,305,283	2,335,541	2,159,422	2,235,819	2,235,819
Other Income or Deductions	132,500	713,169	97,888	166,797	(125,604)	120,000	128,400	128,400
<b>Total</b>	<b>2,777,897</b>	<b>3,167,813</b>	<b>2,704,461</b>	<b>2,897,136</b>	<b>2,705,180</b>	<b>2,652,122</b>	<b>2,750,265</b>	<b>2,750,265</b>
<b>Grand Total</b>	<b>21,968,264</b>	<b>20,128,804</b>	<b>21,775,628</b>	<b>21,929,373</b>	<b>22,182,805</b>	<b>24,085,063</b>	<b>22,820,813</b>	<b>27,752,199</b>

**Summary of Load and Customer/Connection Forecast**

The purpose of this evidence is to present the process used by PUC to prepare the weather normalized load and customer/connection forecast used to design the proposed 2023 distribution rates.

In summary, as a starting point, PUC used the same regression analysis methodology approved by the Ontario Energy Board in its 2018 Cost of Service application (“2018 COS”) (EB-2017-0071) and updated the analysis for actual power purchases to the end of the 2021. The updated regression analysis includes the variables used in the 2018 COS but also includes a trend variable instead of a Conservation and Demand Management (“CDM”) activity variable. These variables reflect the most statistically significant regression output. The regression analysis methodology used in this application has also been used by a number of distributors in more recent cost of service rate applications to determine the forecasted volume. With regards to the overall process of load forecasting, PUC believes that conducting a regression analysis on historical electricity

1 purchases to produce an equation that will predict purchases is appropriate. PUC has the data  
 2 for the amount of electricity (kWh) purchased from the IESO for use by PUC’s customers. With a  
 3 regression analysis, these purchases can be related to other monthly explanatory variables such  
 4 as heating degree days (“HDD”) and cooling degree days (“CDD”) which occur in the same month.  
 5 The results of the regression analysis produce an equation that predicts the purchases based on  
 6 the explanatory variables. This prediction model is then used as the basis to forecast the total  
 7 level of weather normalized purchases for the Bridge Year and the Test Year which is converted  
 8 to billed kWh and kW, where applicable, by rate class. A detailed explanation of the process is  
 9 provided later in this evidence. A live Excel file named “2023 PUC Load Forecast Model - With  
 10 Regression Analysis” has also been provided.

11 **COVID Findings in Regression Analysis**

12 PUC completed the regression analysis using actual data as of year-end 2021. Using the variables  
 13 explained above produced predicted purchases of 558,517,707 kWh for the 2023 test year. PUC  
 14 noticed the customer count to be a bit abnormal in comparison to previous years when running  
 15 this regression analysis. Table 3-2 shows the historical and predicted customer count prior to any  
 16 COVID adjustment.

17 **Table 3-2 Customer Count Prior to COVID Normalization**

Year	Residential	General Service <50 kW	General Service 50 to 4,999 kW	Sentinel Lights	Street Lights	USL	Total
2011 (Actual)	29,124	3,366	403	402	8,846	19	42,160
2012 (Actual)	29,327	3,448	366	392	8,846	21	42,400
2013 (Actual)	29,504	3,474	373	374	8,846	21	42,592
2014 (Actual)	29,514	3,464	370	362	8,846	21	42,577
2015 (Actual)	29,566	3,431	373	360	8,839	21	42,590
2016 (Actual)	29,620	3,414	361	362	8,872	21	42,650
2017 (Actual)	29,729	3,417	361	361	8,070	21	41,959
2018 (Actual)	29,837	3,414	362	355	8,070	23	42,061
2019 (Actual)	29,897	3,388	362	350	8,037	23	42,057
2020 (Actual)	30,026	3,355	370	348	8,037	24	42,160
2021 (Actual)	30,134	3,423	308	330	8,037	24	42,256
2022 (Bridge)	30,237	3,429	305	325	8,037	25	42,357
2023 (Test)	30,340	3,435	303	320	8,037	25	42,459

18

1 Overall PUC has seen a general decline in the consumption for all rate classes over the past 10  
 2 years. However, in 2020 and 2021 PUC sees a dip in the GS<50 and GS>50 consumption which is  
 3 believed to be related to the COVID-19 pandemic. Table 3-3 below shows this historical  
 4 consumption along with the variance in consumption for the two general service classes.

5 **Table 3-3: Historical Consumption GS**

Year	General Service <50 kW	Variance/ Trend	Rolling 5 year Average	General Service 50 to 4,999 kW	Variance/ Trend	Rolling 5 year Average
2011	101,728,299			255,968,368		
2012	97,479,014	(4.2%)		254,314,087	(0.6%)	
2013	95,827,695	(1.7%)		259,048,750	1.9%	
2014	99,153,426	3.5%		258,807,830	(0.1%)	
2015	95,701,162	(3.5%)		254,784,565	(1.6%)	
2016	92,174,996	(3.7%)	(1.9%)	249,955,178	(1.9%)	(0.5%)
2017	91,035,995	(1.2%)	(1.3%)	245,166,376	(1.9%)	(0.7%)
2018	92,759,999	1.9%	(0.6%)	241,817,729	(1.4%)	(1.4%)
2019	91,718,380	(1.1%)	(1.5%)	240,708,316	(0.5%)	(1.4%)
2020	84,774,528	(7.6%)		227,128,751	(5.6%)	
2021	88,569,433	4.5%		219,715,371	(3.3%)	

6  
 7 Table 3-3 shows the rolling 5-year average for the GS<50 rate class ranges from (0.6%) to (1.9%)  
 8 and for the GS>50 from (0.5%) to (1.4%). 2020 and 2021 are two abnormal years in terms of  
 9 consumption variance which hasn't followed the historical trend for PUC. PUC's growth has been  
 10 relatively stagnant over the last 10 years. PUC believes that these outliers are related to the  
 11 COVID-19 pandemic. Additionally in Table 3-4 below, there are fluctuations in customer count  
 12 for 2020 and 2021 for these rate classes.



1

**Table 3-4: General Service Customer Count**

Year	General Service <50 kW	Variance/Trend	Rolling 5 year Average	General Service 50 to 4,999 kW	Variance/Trend	Rolling 5 year Average
2011	3,366			403		
2012	3,448	2.4%		366	(9.2%)	
2013	3,474	0.8%		373	1.9%	
2014	3,464	(0.3%)		370	(0.8%)	
2015	3,431	(1.0%)		373	0.8%	
2016	3,414	(0.5%)	0.3%	361	(3.2%)	(2.1%)
2017	3,417	0.1%	(0.2%)	361	0.0%	(0.3%)
2018	3,414	(0.1%)	(0.3%)	362	0.3%	(0.6%)
2019	3,388	(0.8%)	(0.4%)	362	0.0%	(0.4%)
2020	3,355	(1.0%)		370	2.2%	
2021	3,423	2.0%		308	(16.8%)	

2

3 The most important piece to note here is PUC sees a drop of 16.8% of its GS>50 customers in  
 4 2021. PUC reviews the consumption of the GS<50 and GS>50 rate classes in the fall of each year  
 5 to determine if any customers are required to shift classes based on their consumption. Once  
 6 PUC analyzed the GS>50 consumption of each customer in the fall of 2020, almost all customers  
 7 from that 16.8% drop shifted to the GS<50 class – the GS>50 saw a drop of 62 customers and  
 8 GS<50 saw an increase of 68 customers. However, over time these customers should start to see  
 9 a return to pre pandemic levels of consumption.

10 In order to predict the number of customers for the 2023 test year, PUC uses a 10-year geomean  
 11 and applies this geomean to the last year of actual customer count. Since PUC, saw an abnormal  
 12 drop in number of customers from GS>50 and traced those customers to the GS<50, it was  
 13 determined that some kind of adjustment was needed.

14 Given these findings, PUC has normalized its actual consumption used for 2020 and 2021 for the  
 15 GS<50 and GS>50 rate classes. PUC used the 2012 to 2019 average change in consumption,  
 16 presented in Table 3-5, and average change in customer count, presented in Table 3-6, to  
 17 normalize both consumption and customer count.

1

**Table 3-5: Normalized Small and Large General Service Consumption**

Year	General Service <50 kW	Variance/ Trend	Rolling 5 year Average	General Service 50 to 4,999 kW	Variance/ Trend	Rolling 5 year Average
2011	101,728,299			255,968,368		
2012	97,479,014	(4.2%)		254,314,087	(0.6%)	
2013	95,827,695	(1.7%)		259,048,750	1.9%	
2014	99,153,426	3.5%		258,807,830	(0.1%)	
2015	95,701,162	(3.5%)		254,784,565	(1.6%)	
2016	92,174,996	(3.7%)	(1.9%)	249,955,178	(1.9%)	(0.5%)
2017	91,035,995	(1.2%)	(1.3%)	245,166,376	(1.9%)	(0.7%)
2018	92,759,999	1.9%	(0.6%)	241,817,729	(1.4%)	(1.4%)
2019	91,718,380	(1.1%)	(1.5%)	240,708,316	(0.5%)	(1.4%)
2020	84,774,528	(7.6%)		227,128,751	(5.6%)	
2021	88,569,433	4.5%		219,715,371	(3.3%)	
2012-2019 average		(1.3%)			(0.8%)	
2020 normalized	90,568,262			238,882,521		
2021 normalized	89,432,566			237,070,574		

2

3

**Table 3-6: Normalized Small and Large General Service Customer Count**

Year	General Service <50 kW	Variance/ Trend	Rolling 5 year Average	General Service 50 to 4,999 kW	Variance/ Trend	Rolling 5 year Average
2011	3,366			403		
2012	3,448	2.4%		366	(9.2%)	
2013	3,474	0.8%		373	1.9%	
2014	3,464	(0.3%)		370	(0.8%)	
2015	3,431	(1.0%)		373	0.8%	
2016	3,414	(0.5%)	0.3%	361	(3.2%)	(2.1%)
2017	3,417	0.1%	(0.2%)	361	0.0%	(0.3%)
2018	3,414	(0.1%)	(0.3%)	362	0.3%	(0.6%)
2019	3,388	(0.8%)	(0.4%)	362	0.0%	(0.4%)
2020	3,355	(1.0%)		370	2.2%	
2021	3,423	2.0%		308	(16.8%)	
2012-2019 Average		0.1%			(1.3%)	
2020 Normalized	3,391			357		
2021 Normalized	3,394			353		

4

5 Incorporating these changes into each general service rate classes resulted in the following  
 6 consumption changes shown in Table 3-7 below for 2020 and 2021.

1 **Table 3-7: Summary of Consumption Changes for General Service Rate Classes**

	GS<50	GS>50	Total
2020 Actual	84,774,528	227,128,751	
Adjustment	5,793,735	11,753,769	17,547,504
2020 Normalized	90,568,262	238,882,521	
2021 Actual	88,569,433	219,715,371	
Adjustment	863,133	17,355,203	18,218,336
2021 Normalized	89,432,566	237,070,574	

2  
 3 PUC had to consider this adjustment in its overall purchased power for the each year before  
 4 running the regression analysis again. The result is an adjustment to metered consumption in  
 5 2020 of 17,54,504 kWh and an adjustment in 2021 of 18,218,336 kWh. Once this adjustment is  
 6 added to the actual yearly consumption to get a “COVID normalized” yearly consumption, its  
 7 then grossed up for the loss factor. This results in normalized yearly purchases which will be used  
 8 in the power purchased model regression analysis presented in section 2.1.3.1. Table 3-8 below  
 9 summarizes this.

10 **Table 3-8: Normalized Yearly Purchases**

Year	Change in Total Consumption	Actual Yearly Consumption	Normalized Yearly Consumption	Yearly Loss Facotr	Normalized Yearly Purchass
2020	17,547,504	613,632,199	631,179,703	1.044	659,068,596
2021	18,218,336	604,318,512	622,536,848	1.040	647,740,937

11  
 12 PUC then applied the increase in consumption from normalized purchases evenly across each  
 13 month. For 2020, an increase of 18,322,847 kWh results in a monthly adjustment of 1,526,904  
 14 kWh and in 2021, an increase of 18,955,925 kWh results in a monthly adjustment of 1,579,660  
 15 kWh.

1 PUC also incorporated the normalized customer count from Table 3-6 above. This resulted in the  
 2 change to the yearly customer total as show in Table 3-9.

3 **Table 3-9: Change in General Service Customer Count**

	GS<50	GS>50	Total
2020 Actual	3,355	370	
Adjustment	36	(13)	23
2020 Normalized	3,391	357	
2021 Actual	3,423	308	
Adjustment	(29)	45	16
2021 Normalized	3,394	353	

4  
 5 Therefore, 23 customers were added to the 2020 total count and 16 customers to the 2021 total  
 6 count. Table 3-10 shows the revised total of 33,798 customers for 2020 and 33,905 customers  
 7 for 2021.

8 **Table 3-10: Normalized Customer Count**

Year	Change in Total Customers	Actual Yearly Customer Count	Normalized Yearly Customer Count
2020	23	33,775	33,798
2021	16	33,889	33,905

9  
 10  
 11 Once the purchased kWh and number of customers were normalized in 2020 and 2021, PUC ran  
 12 the regression model again. The following Table 3-11 compares the results of the regression  
 13 before and after COVID-19 normalization.

1

**Table 3-11: Comparison of Regression Analysis**

<b>Year</b>	<b>2023 Regression Actual</b>	<b>2023 Regression Normalized for COVID</b>	<b>Variance</b>
2020	558,517,707	578,772,961	20,255,254
2021	42,460	42,463	3

2

3 PUC submits the load forecasting methodology is reasonable for the purposes of this Application.

4 PUC submits that this load forecast is a better representation of what is likely to occur in its  
5 community by applying the COVID normalization explained above.

6 The following provides the material to support the COVID and weather normalized load forecast  
7 used by PUC in this Application. All numbers presented in 2020 and 2021 have been normalized  
8 for COVID.

9 Table 3-12, Table 3-13, Table 3-14 and Table 3-15 below provide a summary of the COVID and  
10 weather normalized load and customer/connection forecast used in this Application.

**Table 3-12: Summary of Load and Customer/ Connection Forecast (2020 and 2021 COVID Normalized)**

Year	Billed Actual (GWh)	Growth (GWh)	Billed Weather Normal (GWh)	Growth (GWh)	Customer/ Connection Count	Growth
<b>Billed Energy (GWh) and Customer Count / Connections</b>						
2018 Board Approved			628.9		42,050	
2008	710.7	8.9	701.0	2.7	41,729	191
2009	707.8	(2.9)	698.6	(2.4)	41,995	266
2010	683.8	(24.0)	691.4	(7.3)	42,110	115
2011	711.9	28.2	715.0	23.6	42,160	50
2012	676.8	(35.2)	696.8	(18.2)	42,400	240
2013	688.2	11.5	676.7	(20.1)	42,592	192
2014	701.8	13.6	682.9	6.3	42,577	(15)
2015	669.4	(32.5)	661.9	(21.0)	42,590	13
2016	636.9	(32.5)	645.7	(16.2)	42,650	60
2017	622.5	(14.3)	631.5	(14.3)	41,959	(691)
2018	633.7	11.2	618.3	(13.1)	42,061	102
2019	631.9	(1.8)	619.5	1.2	42,057	(4)
2020	631.2	(0.8)	632.2	12.7	42,183	126
2021	622.5	(8.6)	651.1	18.9	42,272	89
2022 Bridge			602.7	(48.4)	42,367	95
2023 Test			578.8	(23.9)	42,463	96

In the above Table 3-12, the billed GWh data from 2008 to 2021 reflects actual weather and weather normal conditions in each year. In 2017, there is a slightly abnormal dip in customer count as a result of shifting from ‘number of devices’ to ‘number of connections’ for the Street Light class, as outlined in PUC’s 2018 COS (EB-2017-0071, Ex 3 pg. 6 of 51). The weather normal values are the actual values adjusted by the weather normal conversion factor outlined in Table 3-13. The weather conversion factor is determined consistent with the approach outlined by the Board in Appendix 2-IA. For 2022 and 2023, the forecasted billed GWh is on a weather normal basis.

1 Customer/Connection values are on an average basis and street lights and sentinel lights are  
2 measured as connections. PUC has continued to use number of connections for measuring  
3 Streetlights since its 2018 COS application (EB-2017-0071).

4 On a rate class basis, the actual and forecasted billed amounts are shown in Table 3-14. Actual  
5 volumes have been weather normalized by rate class using the weather normal conversion factor  
6 from Table 3-15. The actual and forecasted number of customers/connections is shown in Table  
7 3-14. The customer/connection usage on an actual and weather normal basis is shown in Table  
8 3-15.

1

**Table 3-13: Billed GWh by Rate Class (2020 and 2021 COVID Normalized)**

Year	Residential	General Service < 50 kW	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Unmetered Scattered Load	Total
<b>Billed Energy (GWh) - Actual</b>							
2008	347.4	93.5	261.1	0.3	7.6	0.8	710.7
2009	348.6	91.5	259.0	0.3	7.6	0.8	707.8
2010	326.5	91.4	257.0	0.3	7.8	0.8	683.8
2011	345.3	101.7	256.0	0.3	7.8	0.9	711.9
2012	316.1	97.5	254.3	0.2	7.7	0.9	676.8
2013	324.2	95.8	259.0	0.2	8.1	0.9	688.2
2014	335.0	99.2	258.8	0.2	7.8	0.9	701.8
2015	310.5	95.7	254.8	0.2	7.3	0.9	669.4
2016	288.7	92.2	250.0	0.2	4.9	0.9	636.9
2017	282.8	91.0	245.2	0.2	2.4	0.9	622.5
2018	295.6	92.8	241.8	0.2	2.4	0.9	633.7
2019	296.0	91.7	240.7	0.2	2.4	0.9	631.9
2020	298.2	90.6	238.9	0.2	2.5	0.9	631.2
2021	292.5	89.4	237.1	0.2	2.5	0.9	622.5
<b>Billed Energy (GWh) - Weather Normal</b>							
2008	340.4	91.6	255.9	0.3	7.5	0.8	696.4
2009	341.6	89.6	253.8	0.3	7.5	0.8	693.6
2010	319.9	89.5	251.9	0.3	7.6	0.8	670.0
2011	338.4	99.7	250.8	0.3	7.7	0.9	697.6
2012	309.8	95.5	249.2	0.2	7.6	0.8	663.2
2013	317.7	93.9	253.9	0.2	7.9	0.8	674.4
2014	328.2	97.2	253.6	0.2	7.7	0.9	687.8
2015	304.2	93.8	249.7	0.2	7.1	0.9	656.0
2016	283.0	90.3	244.9	0.2	4.8	0.9	624.1
2017	277.1	89.2	240.2	0.2	2.4	0.9	610.1
2018	289.7	90.9	237.0	0.2	2.4	0.9	621.0
2019	290.1	89.9	235.9	0.2	2.4	0.8	619.3
2020	292.2	88.8	234.1	0.2	2.4	0.9	618.5
2021	286.6	87.6	232.3	0.2	2.4	0.9	610.0

2

3



1 **Table 3-14: Number of Customers/ Connections (2020 and 2021 COVID Normalized)**

Year	Residential	General Service < 50 kW	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Unmetered Scattered Load	Total
2008	28,780	3,325	426	435	8,741	22	41,729
2009	28,971	3,352	433	423	8,799	17	41,995
2010	29,057	3,345	435	411	8,846	16	42,110
2011	29,124	3,366	403	402	8,846	19	42,160
2012	29,327	3,448	366	392	8,846	21	42,400
2013	29,504	3,474	373	374	8,846	21	42,592
2014	29,514	3,464	370	362	8,846	21	42,577
2014	29,566	3,431	373	360	8,839	21	42,590
2015	29,620	3,414	361	362	8,872	21	42,650
2016	29,729	3,417	361	361	8,070	21	41,959
2017	29,837	3,414	362	355	8,070	23	42,061
2018	29,897	3,388	362	350	8,037	23	42,057
2019	30,026	3,391	357	348	8,037	24	42,183
2020	30,134	3,394	353	330	8,037	24	42,272
2021	30,237	3,397	348	324	8,037	25	42,367

2

1

**Table 3-15: Annual Usage by Rate Class 2020 and 2021 COVID Normalized)**

Year	Residential	General Service < 50 kW	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Unmetered Scattered Load
<b>Actual Annual Energy Usage per Customer/Connection (kWh per customer/connection)</b>						
2008	12,070	28,113	612,967	618	872	38,560
2009	12,033	27,282	598,148	621	864	48,438
2010	11,236	27,318	590,889	628	877	52,327
2011	11,856	30,222	635,157	648	883	46,046
2012	10,779	28,271	694,847	629	875	41,047
2013	10,988	27,584	694,501	635	914	40,830
2014	11,329	28,899	693,855	676	884	41,715
2015	10,481	28,032	705,774	650	822	43,462
2016	9,713	26,975	692,397	629	603	43,012
2017	9,479	26,665	677,255	602	297	39,466
2018	9,888	27,379	668,005	597	298	38,922
2019	9,859	27,048	674,253	594	300	36,103
2020	9,895	26,685	676,721	619	307	36,284
2021	9,673	26,328	680,544	629	306	35,735
<b>Normalized Annual Energy Usage per Customer/Connection (kWh per customer/connection)</b>						
2008	11,827	27,549	600,671	605	854	37,787
2009	11,792	26,735	586,149	608	847	47,466
2010	11,011	26,770	579,036	615	859	51,277
2011	11,618	29,616	622,416	635	866	45,122
2012	10,563	27,704	680,908	616	857	40,224
2013	10,767	27,031	680,569	622	896	40,011
2014	11,121	28,050	685,449	659	865	40,879
2015	10,290	27,334	669,366	640	809	42,590
2016	9,553	26,458	678,507	615	538	42,149
2017	9,322	26,108	665,508	580	291	42,357
2018	9,709	26,625	654,604	577	291	38,142
2019	9,703	26,528	651,601	579	294	36,917
2020	9,732	26,173	655,715	575	301	35,556
2021	9,512	25,822	658,116	605	300	35,846

### 3.1.2 Multivariate Regression Model

PUC’s weather normalized load forecast is developed in a four-step process. First, the 2020 and 2021 actual purchases and customer count were normalized to adjust for those years being affected by COVID-19. Second, a total system weather normalized purchased power forecast is developed based on a regression analysis that incorporates variables that impact PUC usage. Third, the weather normalized purchased power forecast is adjusted by a historical loss factor to produce a weather normalized billed forecast. Finally, the forecast of billed energy by rate class is developed based on a forecast of customer numbers and historical usage patterns per customer. For the rate classes that have weather sensitive load, their forecasted billed energy is adjusted to ensure that the total billed energy forecast by rate class is equivalent to the total weather normalized billed energy forecast. The forecast of customers by rate class was determined using a 10-year geometric mean analysis. The forecast also contains a manual adjustment for expected CDM results. For those rate classes that use kW as the distribution volumetric billing determinant, an adjustment factor is applied to the class energy forecast based on the historical relationship between kW and kWh. The following will explain the forecasting process in more detail.

#### **Purchased KWh Load Forecast**

An equation to predict total system purchased energy is developed using a multivariate regression model with independent variables outlined below. The regression model uses monthly kWh and monthly values of independent variables from January 2011 to December 2021 to determine the monthly regression coefficients. This provides 132 monthly data points which are a reasonable data set for use in a multiple regression analysis.

1 With regards to weather normalization, PUC submits that it is appropriate to review the impact  
2 of weather over the past ten years January 2012 to December 2021 since it is consistent with the  
3 time period for weather normalization outlined in the filing requirements. It is also reflective of  
4 more recent weather conditions. The average weather conditions over this period are applied in  
5 the prediction formula to determine a weather normalized forecast.

6

7 The multivariate regression model has determined the drivers of year-over-year changes in PUC's  
8 load growth are weather (HDD and CDD), calendar variables (days in month and seasonal flag),  
9 number of customers and a trend variable. These factors are captured within the multivariate  
10 regression model.

11

12 Weather impacts on load are apparent in both the winter heating season and in the summer  
13 cooling season. For that reason, both HDD (i.e. a measure of coldness in winter) and CDD (i.e. a  
14 measure of summer heat) are modeled.

15

16 Other factors determining energy use in the monthly model are the number of days in a particular  
17 month and a flag that indicates spring and fall months.

18

19 The regression analysis also indicates that the number of customers and a trend variable are  
20 significant contributors to the total energy used in the PUC service area.

21

22 The following outlines the predication model used by PUC to predict weather normal purchases  
23 for 2022 and 2023.

24

25

1 PUC Distribution Monthly Predicted kWh Purchases  
2 = Constant of (2,885,688)  
3 + Heating Degree Days \* 35,098  
4 + Cooling Degree Days \* 122,990  
5 + Spring Fall Flag \* (2,820,823)  
6 + Number of Days in the Month \* 1,715,046  
7 + Number of Customers \* (43)  
8 + Trend Variable (65,955)  
9

10 The monthly data used in the regression model and the resulting monthly prediction for the  
11 actual and forecasted years are provided in Appendix A.

12

13 The sources of data for the various data points are:

- 14 • Environment Canada’s website provided the monthly HDD and CDD information.  
15 Weather data from the Sault Ste. Marie Weather Station was used. 18° C is the base  
16 number from which HDD and CDD are measured.
- 17 • Annual calendars provide information related to number of days in the month and the  
18 months defined to be spring or fall (i.e. March to May and September to November).
- 19 • PUC’s billing system provided the customer data.
- 20 • The trend variable is used to capture the general direction of consumption over time that  
21 cannot be explained or is directly observable. For PUC, this variable appears to be  
22 capturing the declining consumption overall.

23

24

25

**Table 3-16: Statistical Results**

R Square	95.8%
Adjusted R Square	95.6%
F Test	476.0
MAPE (Monthly)	0.0%
T-stats by Coefficient	
Heating Degree Days	40.7
Cooling Degree Days	7.5
Spring Fall Flag	(6.8)
Number of Days in Month	7.6
Trend	(3.9)
Number of Customers	(1.6)
Constant	1.5

The annual results of the above prediction formula compared to the actual annual purchases from 2011 to 2021 are shown below in Table 3-17 along with the predicted total system purchases for PUC for 2022 and 2023 on a weather normal basis. In addition, weather normal values for 2023 are provided on a 20-year trend assumption for weather normalization. Information is also provided to show the Weather Normal Conversion Factor which is used to weather normalize actual volume data. In Table 3-17, the Predicted Weather Normal values are similar to the Predicted amounts, but the weather normalized HDD and CDD used to determine the weather normal forecast for 2022 and 2023 are used in the prediction formula in place of actual HDD and CDD. The ratio of Predicted Weather Normal to Predicted Values results in a Weather Normal Conversion Factor. This factor is applied to the actual amount which results in the Actual Weather Normal value.

1

**Table 3-17: Total System Purchase (2020 and 2021 COVID Normalized)**

Year	Actual	Predicted	% Difference	Predicted Weather Normal	Weather Normal Conversion Factor	Actual Weather Normal
<b>Purchased Energy (GWh)</b>						
2011	745.0	731.1	(1.9%)	734.2	1.0043	748.2
2012	707.0	705.5	(0.2%)	726.4	1.0296	727.9
2013	730.6	727.3	(0.5%)	715.0	0.9832	718.3
2014	730.5	725.1	(0.7%)	705.5	0.9731	710.8
2015	698.5	703.9	0.8%	696.0	0.9888	690.7
2016	670.0	678.8	1.3%	688.2	1.0139	679.2
2017	653.0	667.4	2.2%	677.0	1.0143	662.3
2018	666.7	684.0	2.6%	667.4	0.9757	650.6
2019	660.6	671.1	1.6%	657.9	0.9804	647.7
2020	659.1	647.3	(1.8%)	648.3	1.0016	660.1
2021	647.7	610.8	(5.7%)	638.8	1.0459	677.5
2022 Bridge		630.5		629.2	0.9980	
2023 Test		620.9		619.7	0.9980	
2023 - 20 year trend		594.0		594.0	1.0000	

2

3 The weather normalized amount for 2023 is determined by using 2023 dependent variables in  
 4 the prediction formula on a monthly basis along with the average monthly HDD and CDD which  
 5 have occurred from January 2011 to December 2021. The 2023 weather normal 20-year trend  
 6 value reflects the trend in monthly HDD and CDD which have occurred from January 2002 to  
 7 December 2021.

8

9 **Billed KWh Load Forecast**

10 To determine the total weather normalized energy billed forecast, the total system weather  
 11 normalized purchases forecast is adjusted by a historical loss factor. The historical loss factor  
 12 used is 4.62% which represents the average loss factor from 2017 to 2021. With this average loss  
 13 factor the total weather normalized billed energy before the adjustment discussed below will be  
 14 602.7 (GWh) for 2022 (i.e. 630.5/1.0462) and 593.5 (GWh) for 2023 (i.e. (i.e. 621.0/1.0462).

1 **Billed KWh Load Forecast and Customer/Connection Forecast by Rate Class**

2 Since the total weather normalized billed PUC Distribution amount is known, this amount needs  
 3 to be distributed by rate class for rate design purposes taking into consideration the  
 4 customer/connection forecast and expected usage per customer by rate class.

5  
 6 The next step in the forecasting process is to determine a customer/connection forecast. The  
 7 customer/connection forecast is based on reviewing historical customer/connection data that is  
 8 available as shown in the following Table 3-18.

9  
 10 **Table 3-18: Historical Customer/Connection Data**  
 11 **(2020 and 2021 COVID Normalized)**

Year	Residential	General Service < 50 kW	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Unmetered Scattered Load	Total
<b>Number of Customers/Connections</b>							
2008	28,780	3,325	426	435	8,741	22	41,729
2009	28,971	3,352	433	423	8,799	17	41,995
2010	29,057	3,345	435	411	8,846	16	42,110
2011	29,124	3,366	403	402	8,846	19	42,160
2012	29,327	3,448	366	392	8,846	21	42,400
2013	29,504	3,474	373	374	8,846	21	42,592
2014	29,514	3,464	370	362	8,846	21	42,577
2015	29,566	3,431	373	360	8,839	21	42,590
2016	29,620	3,414	361	362	8,872	21	42,650
2017	29,729	3,417	361	361	8,070	21	41,959
2018	29,837	3,414	362	355	8,070	23	42,061
2019	29,897	3,388	362	350	8,037	23	42,057
2020	30,026	3,391	357	348	8,037	24	42,183
2021	30,134	3,394	353	330	8,037	24	42,272

12  
 13 From the historical customer/connection data the growth rate in customer/connection can be  
 14 evaluated which is provided on the following Table 3-19.



1  
2

**Table 3-19: Growth Rate in Customer/Connections  
 (2020 and 2021 COVID Normalized)**

Year	Residential	General Service < 50 kW	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Unmetered Scattered Load
<b>Growth Rate in Customers/Connections</b>						
2012	0.7%	2.4%	(9.2%)	(2.5%)	0.0%	10.5%
2013	0.6%	0.8%	1.9%	(4.6%)	0.0%	0.0%
2014	0.0%	(0.3%)	(0.8%)	(3.2%)	0.0%	0.0%
2015	0.2%	(1.0%)	0.8%	(0.6%)	(0.1%)	0.0%
2016	0.2%	(0.5%)	(3.2%)	0.6%	0.4%	0.0%
2017	0.4%	0.1%	0.0%	(0.3%)	(9.0%)	0.0%
2018	0.4%	(0.1%)	0.3%	(1.7%)	0.0%	9.5%
2019	0.2%	(0.8%)	0.0%	(1.4%)	(0.4%)	0.0%
2020	0.4%	0.1%	(1.4%)	(0.6%)	0.0%	4.3%
2021	0.4%	0.1%	(1.1%)	(5.2%)	0.0%	0.0%
Geometric Mean	0.3%	0.1%	(1.3%)	(2.0%)	0.0%	2.4%

3

4 The geometric mean was determined for each rate class to reflect the average growth rate from  
 5 2012 to 2021.

6 The geometric mean analysis was used to forecast the number of customers/connections for  
 7 2022 and 2023. The results of the geometric mean analysis were applied to the 2021  
 8 customer/connection value to determine the 2022 customer/connection forecast. The 2023  
 9 customer/connection forecast is determined by applying the geometric mean factor to the 2022  
 10 forecast. Table 3-20 outlines the forecast of customers/connections by rate class.

11  
12

**Table 3-20: Customer/Connection Forecast  
 (2020 and 2021 COVID Normalized)**

Year	Residential	General Service < 50 kW	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Unmetered Scattered Load	Total
<b>Forecast Number of Customers/Connections</b>							
2022	30,237	3,397	348	324	8,037	25	42,367
2023	30,340	3,400	344	317	8,037	25	42,463

13

1 The next step in the process is to review the historical customer/connection usage and to reflect  
 2 this usage per customer in the forecast. Table 3-21 below provides the average annual usage per  
 3 customer by rate class for 2021.

4  
 5 **Table 3-21: 2021 Actual Annual Usage per Customer**  
 6 **(2020 and 2021 COVID Normalized)**  
 7

Year	Residential	General Service < 50 kW	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Unmetered Scattered Load
<b>Annual kWh Usage Per Customer/Connection</b>						
2021	9,706	26,350	671,588	617	306	708,568

8  
 9 The geomean from 2011 to 2021 was used to forecast 2022 and 2023 usage per  
 10 customer/connection except for the Street Light class. The Street Light class forecast was held  
 11 constant using a geomean of 1.0. The resulting usage forecast is as follows in Table 3-22.

12  
 13 **Table 3-22: Forecast Annual kWh Usage per Customer/Connection**  
 14 **(2020 and 2021 COVID Normalized)**

Year	Residential	General Service < 50 kW	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Unmetered Scattered Load
<b>Forecast Annual kWh Usage per Customers/Connection</b>						
2022	9,514	25,991	675,344	614	306	35,748
2023	9,326	25,637	679,121	611	306	34,934

15  
 16  
 17 The preceding information is used to determine the non-normalized weather billed energy  
 18 forecast by applying the forecasted number of customer/connection from Table 3-20 by the  
 19 forecast of annual usage per customer/connection from Table 3-22. The resulting non-  
 20 normalized weather billed PUC forecast is shown in the following Table 3-23.

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**Table 3-23: Non-normalized Weather Billed PUC Distribution Forecast  
 (2020 and 2021 COVID Normalized)**

Year	Residential	General Service < 50 kW	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Unmetered Scattered Load	Total
<b>NON-normalized Weather Billed Energy Forecast (GWh)</b>							
2022	287.7	88.3	235.3	0.2	2.5	0.9	614.8
2023	282.9	87.2	233.5	0.2	2.5	0.9	607.1

The non-normalized weather billed energy forecast has been determined but it needs to be adjusted in order to be aligned with the total weather normalized billed energy forecast. As previously determined, the total weather normalized billed energy forecast is 602.7 (GWh) for 2022 and 593.5 (GWh) for 2023.

The difference between the non-normalized and normalized forecast adjustments is (12.1) GWh in 2022 (i.e. 602.7 – 614.8) and (13.6) GWh in 2018 (i.e. 593.5 – 607.1). The difference is assumed to be the adjustment needed to move the forecast to a weather normal basis and this amount will be assigned to those rate classes that are weather sensitive. PUC used the same weather sensitivity percentages as presented in its 2018 COS Application (EB-2017-0071). The following table 3-24 represents the percentages used.

**Table 3-24: Weather Sensitivity by Rate Class**

Residential	General Service < 50 kW	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Unmetered Scattered Load
<b>Weather Sensitivity</b>					
92.7%	92.7%	85.3%	0.0%	0.0%	0.0%

1 For the GS > 50 kW class a weather sensitivity amount of 85.3% was provided in the weather  
2 normalization work completed by Hydro One. For the Residential and GS < 50 kW classes, it was  
3 assumed in the 2018 COS application that the weather sensitivity for the Residential and GS < 50  
4 kW classes was mid-way between 100.0% and 85.3%, or 92.7%. This assumption has been  
5 maintained in this application.

6  
7 The difference between the non-normalized and normalized forecast of (12.1) GWh in 2022 and  
8 (13.6) GWh in 2023 has been assigned on a pro rata basis to each rate class based on the above  
9 level of weather sensitivity.

10

### 11 3.1.3 Normalized Average use per Customer (“NAC”) Model

12

13 PUC did not use this methodology.

14

### 15 3.1.4 CDM Adjustment and LRAMVA

16

#### 17 CDM Adjustment

18

19 On December 20, 2021 the OEB issued a report *Conservation and Demand Management*  
20 *Guidelines for Electricity Distributors* which provided updated guidance on the role of CDM for  
21 regulated LDCs. PUC has reviewed these guidelines which resulted in a manual adjustment to the  
22 load forecast for CDM. This CDM adjustment has been made to reflect the impact of CDM  
23 activities that are expected to be implemented from 2023 to 2027 within PUC’s service territory  
24 based on its share of electricity use within the province, the IESO’s 2021-2024 Conservation  
25 Demand Management Framework, and the IESO Planning Outlook. No CDM adjustment is  
26 required for PUC’s CDM programs offered under the Conservation First Framework, as there

1 were no projects completed in 2021, and the use of actual load data for 2021 in the forecast  
 2 means that the impact of CFF programs is already fully captured in the load forecast.

3  
 4 The IESO’s Planning Outlook indicates that conservation activities will continue to be  
 5 implemented in 2023 and beyond. IESO’s forecast of CDM impacts between 2023 and 2027 are  
 6 shown on Table 3-25. These programs will put downward pressure on PUC’s billing determinants,  
 7 which makes it appropriate to consider CDM impacts throughout the 5-year period in the 2023  
 8 COS load forecast. The average over the five years is considered as there is no LRAMVA or other  
 9 adjustment that will capture the plans to grow CDM savings over the same period the forecast  
 10 applies to.

11  
 12 **Table 3-25: Province-wide Annual Energy Conservation Savings (TWh)**

<b>Program</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>Average</b>
2021 - 2024 CDM Framework	1.43	2.11	2.73	2.94	2.94	2.43
Climate Action Incentive Fund	0.83	1.10	1.06	1.00	0.90	0.98
Green Municipal Fund	0.03	0.04	0.05	0.06	0.07	0.05
Greener Homes Grant	0.12	0.17	0.21	0.25	0.29	0.21
Post 2024 IESO Programs	0.00	0.00	0.14	0.70	1.48	0.46

13  
 14 Source: IESO. 2022. Demand-Forecast-Model-Data\_1.xlsb

15  
 16 These savings are attributed to customer classes based on PUC’s historic allocation of the 2015-  
 17 2020 CDM Framework.

18  
 19 The IESO programs delivered in 2021 will already be partly captured in the load data used in the  
 20 regression analysis, therefore a weighting factor of 0.5 is assigned to IESO planned savings in  
 21 2021 that persist through the forecast horizon. IESO’s planned savings for 2021-2024 are shown  
 22 on Table 3-26.

1 **Table 3-26: IESO 2021-2024 Planned CDM Savings by Program (GWh/a)**

2021-2024 CDM Framework				
Program	2021	2022	2023	2024
Retrofit Program	354.3	337.8	217.2	217.2
Small Business Program	40.2	28.5	14.3	15.3
Energy Performance Program	21.8	17.3	34.1	35.6
Energy Management	16.4	47.3	115.2	115.2
Customer Solutions	0	0	325.7	325.7
Local Initiatives	52.4	52.4	62.9	62.9
Energy Affordability Program	47.6	50.3	52.3	54
First Nations Program	10.3	7.3	7.3	7.3
<b>Total</b>	<b>543.0</b>	<b>540.9</b>	<b>829.0</b>	<b>833.2</b>

2  
 3 Source: IESO. 2021. 2021-2024 Conservation and Demand Management Framework.  
 4 <https://ieso.ca/-/media/Files/SaveOnEnergy/2021-2024-CDM-Framework-Program-Plan.ashx>, p.24.  
 5

6 The cumulative savings from these programs, and the estimated allocation across rate classes  
 7 applicable to PUC are shown on Table 3-27. These savings are slightly higher than those in the  
 8 IESO forecast. The values in the IESO forecast are used for PUC’s analysis, with the allocation  
 9 across rate classes from the IESO 2021-2024 plan.

10

1 **Table 3-27 Allocation of IESO Programs in the 2021-2024 Framework Applicable to PUC**

Program	Cumulative savings in 2024 (GWh)	Cumulative savings (%)	Estimated allocation for PUC		
			Residential	GS<50	GS>50
Retrofit Program	949.35	38.4%	0.0%	24.4%	75.6%
Small Business Program	78.20	3.2%	0.0%	100.0%	0.0%
Energy Performance Program	97.90	4.0%	0.0%	24.4%	75.6%
Energy Management	285.90	11.6%	0.0%	24.4%	75.6%
Customer Solutions	651.40	26.3%	0.0%	24.4%	75.6%
Local Initiatives	204.40	8.3%	0.0%	0.0%	0.0%
Energy Affordability Program	180.40	7.3%	100.0%	0.0%	0.0%
First Nations Program	27.05	1.1%	0.0%	0.0%	0.0%
<b>Total</b>	<b>2,474.60</b>	<b>100.0%</b>	<b>7.3%</b>	<b>22.7%</b>	<b>60.7%</b>

2  
 3 Notes: Cumulative savings in 2024 are calculated from Table 3-26 with 2021 at 50% as half of those savings are  
 4 already captured in PUC’s regression analysis  
 5 Allocation of business programs other than the Small Business Program is based on PUC’s results for the Retrofit  
 6 Program in 2015-2017  
 7

8 The overall allocation is assumed to be the same in the post-2024 period.  
 9

10 In addition to the IESO programs, Table 3-25 includes several federal programs that IESO  
 11 forecasts will impact on electricity demand in Ontario, including a green homes program, and  
 12 programs targeted at Small and Medium Enterprises (“SMEs”)Es (up to 499 employees) and the  
 13 Municipalities, Universities, School Boards and Hospitals (“MUSH”) sector. The non-residential  
 14 programs are assumed to yield savings proportional to energy use in the general service rate  
 15 classes. These programs are scaled to PUC based on its share of total metered kWh in the  
 16 province.  
 17

18 Based on the estimated savings and the allocations described above, the average overall annual  
 19 impact of conservation initiatives on PUC’s load in the 2023 to 2027 period not captured by the  
 20 regression data are shown on Table 3-28.

1 An adjustment is applied to the forecast CDM results as the estimated value captured in the load  
 2 forecast is based on an earlier estimate. The adjustment will be removed at the time other  
 3 changes are made to the load forecast.

4

5 **Table 3-28: Annual adjustment required to forecast for CDM in 2023-2027 (kWh)**

Program	PUC manual adjustment for CDM (kWh)			
	Residential	GS<50	GS>50	Total
Program	1,080,723	3,730,287	5,508,418	10,319,429
Less 1/2 of estimated 2021 savings	(90,266)	(311,566)	(460,081)	(861,912)
Climate Action Incentive Fund	-	1,798,141	2,661,234	4,459,375
Green Municipal Fund	-	91,929	136,055	227,984
Greener Homes Grant	1,434,227	-	-	1,434,227
Post 2024 IESO Programs	206,360	712,285	1,051,813	1,970,459
<b>Sub-total</b>	<b>2,631,046</b>	<b>6,021,077</b>	<b>8,897,439</b>	<b>17,549,562</b>
Proposed loss factor	4.62%			
<b>Total CDM results forecast</b>	<b>2,752,600</b>	<b>6,299,251</b>	<b>9,308,501</b>	<b>18,360,352</b>
Adjustment to match load forecast	-40%	-3%	-25%	
<b>CDM adjustment to load forecast</b>	<b>1,643,785</b>	<b>6,084,747</b>	<b>7,026,072</b>	<b>14,754,604</b>

6

7 **Billed KW Load Forecast**

8

9 There are three rate classes that charge volumetric distribution on a kW basis. These include GS  
 10 50 to 4,999 kW, Sentinel Lights and Street Lights. The forecast of kW for GS 50 to 4,999 kW and  
 11 Sentinel Lights classes is based on a review of the historical ratio of kW to kWh and applying the  
 12 average ratio to the forecasted kWh to produce the required kW.

13

14 The following Table 3-29 outlines the annual demand units by applicable rate class on actual and  
 15 weather normal basis. The weather normal values are actual values adjusted by the weather  
 16 normal conversion factor outlined in Table 3-17.



1 **Table 3-29: Historic Annual kW Applicable Rate Class (2020 and 2021 COVID Normalized)**

Year	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Total	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Total
<b>Billed Annual kW</b>								
	<b>Actual</b>				<b>Weather Normal</b>			
2009	637,622	730	21,346	659,698	629,411	721	21,071	651,203
2010	635,104	714	23,264	659,082	642,188	722	23,524	666,434
2011	629,024	703	21,619	651,346	631,709	706	21,711	654,126
2012	627,836	687	21,596	650,119	646,433	707	22,236	669,376
2013	656,137	660	21,588	678,385	645,100	649	21,225	666,974
2014	634,289	676	21,876	656,841	617,201	658	21,287	639,145
2015	711,311	752	21,794	733,857	703,362	744	21,550	725,656
2016	622,066	630	14,262	636,959	630,691	639	14,460	645,790
2017	610,764	619	7,030	618,413	619,508	628	7,131	627,267
2018	604,549	612	7,030	612,191	589,879	597	6,860	597,336
2019	594,560	605	7,056	602,221	582,884	593	6,917	590,395
2020	546,908	598	7,202	554,707	547,801	598	7,214	555,613
2021	536,707	596	7,202	544,505	561,332	624	7,532	569,488

2

3 The following Table 3-30 shows the historical ratio of kW/kWh as well as the average.

1

**Table 3-30: Historical kW/kWh Ratio per Applicable Rate Class**

Year	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights
<b>Ratio of kW to kWh</b>			
2008	0.2492%	0.2768%	0.2797%
2009	0.2462%	0.2781%	0.2808%
2010	0.2471%	0.2766%	0.3000%
2011	0.2457%	0.2700%	0.2766%
2012	0.2469%	0.2787%	0.2791%
2013	0.2533%	0.2781%	0.2669%
2014	0.2451%	0.2778%	0.2800%
2015	0.2792%	0.3197%	0.2987%
2016	0.2489%	0.2775%	0.2929%
2017	0.2491%	0.2898%	0.2931%
2018	0.2500%	0.2926%	0.2931%
2019	0.2470%	0.2926%	0.2927%
2020	0.2289%	0.2927%	0.2917%
2021	0.2264%	0.2929%	0.2928%
Average 2011 to 2021	0.2473%	0.2875%	0.2871%
Used for Forecast	0.2473%	0.2875%	0.2871%

2

3 The following Table 3-31 outlines the forecast of kW for the applicable rate classes.

4

5

**Table 3-31: kW Forecast by Applicable Rate Class**

Year	General Service 50 to 4,999 kW	Sentinel Lighting	Street Lights	Total
<b>Predicted Billed kW</b>				
2022	570,894	580	7,200	578,675
2023	547,687	566	7,200	555,454

6

1 Table 3-32 provides a summary of the total load forecast on a power purchased and billed level  
 2 from 2018 Board Approved to 2023 Test Year.

3  
 4  
 5

**Table 3-32: Summary of Total Load Forecast  
 (2020 & 2021 COVID Normalized)**

	2018 Board Approved	2018 Actual	2019 Actual	2020 Actual	2021 Actual	2022 Bridge Year	2023 Test Year
<b>Purchases</b>							
Actual kWh Purchases		666,736,298	660,639,514	659,068,596	647,740,937		
Predicted kWh Purchases before	659,159,220	684,015,773	671,082,095	647,283,485	610,764,456	630,498,752	620,948,538
% Difference between actual and predicted purchases		2.6%	1.6%	(1.8%)	(5.7%)		
Loss Factor						1.0462	1.0462
Total Billed Before CDM Adjustments						602,656,043	593,527,565
CDM Adjustment						0	0
Total Billed After Adjustments		633,697,927	631,945,814	631,179,704	622,536,838	602,656,043	593,527,565
<b>Billing Determinants</b>							
<b>Residential</b>							
Customers	29,816	29,837	29,897	30,026	30,134	30,237	30,340
kWh	288,323,799	295,617,651	296,035,266	298,184,963	292,492,184	281,801,295	274,738,681
<b>General Service &lt; 50 kW</b>							
Customers	3,431	3,414	3,388	3,355	3,423	3,397	3,400
kWh	92,411,463	92,759,999	91,718,380	84,774,528	88,569,433	86,483,996	79,051,528
<b>General Service 50 to 4,999 kW</b>							
Customers	357	362	362	370	308	348	344
kWh	244,620,697	241,817,729	240,708,316	227,128,751	219,715,371	230,833,868	221,450,388
kW	614,743	604,549	594,560	546,908	536,707	570,894	547,687
<b>Sentinel Lighting</b>							
Connections	354	355	350	348	330	324	317
kWh	209,800	209,111	206,826	204,140	203,611	198,666	193,841
kW	593	612	605	598	596	580	566
<b>Street Lights</b>							
Connections	8,070	8,070	8,037	8,037	8,037	8,037	8,037
kWh	2,398,221	2,398,221	2,410,546	2,468,997	2,459,994	2,459,994	2,459,994
kW	7,030	7,030	7,056	7,202	7,202	7,200	7,200
<b>Unmetered Scattered Load</b>							
Connections	22	23	23	24	24	25	25
kWh	944,731	895,217	866,480	870,821	877,918	878,223	878,528
<b>Total</b>							
Customer/Connections	42,050	42,061	42,057	42,183	42,272	42,367	42,463
kWh	628,908,711	633,697,927	631,945,814	631,179,704	622,536,838	602,656,043	578,772,961
kW from applicable classes	622,366	612,191	602,221	554,707	544,505	578,675	555,454

6  
 7

## 3.2 ACCURACY OF LOAD FORECAST AND VARIANCE ANALYSES

The following discussion provides a year over year variance analysis on PUC’s distribution revenue and billing determinants. The variance analysis will compare 2018 Board Approved to 2018 Actual; 2018 Actual to 2019 Actual; 2019 Actual to 2020 Actual; 2020 Actual to 2021 Actual; 2021 Actual to 2022 Bridge and 2022 Bridge Year to 2023 Test Year. The distribution revenue variance analysis is based on information provided in Table 3-1. The billing determinant variance analysis is based on data outlined in Table 3-33. The overall variance analysis has been provided based on PUC Distribution’s materiality of \$135,000, as noted earlier in Exhibit 1 of this Application.

### 2018 Board Approved vs. 2018 Actual

**Table 3-33: Distribution Revenue - 2018 Board Approved vs 2018 Actual**

Distribution Throughput Revenue	2018 Board Approved	2018 Actual	Difference \$	Difference %
Residential	11,226,807	9,190,889	(2,035,918)	(18.1%)
General Service <50 kW	3,149,458	3,119,001	(30,457)	(1.0%)
General Service 50 to 4,999 kW	4,544,464	4,149,200	(395,264)	(8.7%)
Sentinel Lighting	34,742	76,498	41,756	120.2%
Street Lighting	195,345	395,492	200,147	102.5%
Unmetered Scattered Load	39,551	29,910	(9,641)	(24.4%)
<b>Total</b>	<b>19,190,367</b>	<b>16,960,991</b>	<b>(2,229,376)</b>	<b>(11.6%)</b>

Throughput revenue for 2018 was \$2,229,376 or 12.00% lower than the amounts approved in the 2018 COS due to the revised rates not being in effective for the full year (effective October 1, 2018) and lower actual consumption vs. predicted consumption.

1 **Table 3-34: Billing Determinants – 2018 Board Approved vs 2018 Actual**

Billing Quantities	Customers / Connections		Units	Volume		Volume Weather Normal		Annual Usage Per Customer / Connection		Annual Usage Per Customer / Connection Weather Normal	
	2018 Board Approved	2018 Actual		2018 Board Approved	2018 Actual	2018 Board Approved	2018 Actual	2018 Board Approved	2018 Actual	2018 Board Approved	2018 Actual
<b>Weather Normal Conversion Factor</b>						0.9832					
Residential	29,816	29,837	kWh	288,323,799	295,617,651	288,323,799	290,645,087	9,670	9,908	9,670	9,741
General Service < 50 kW	3,431	3,414	kWh	92,411,463	92,759,999	92,411,463	91,199,690	26,934	27,170	26,934	26,713
General Service 50 to 4,999 kW	357	362	kW	614,743	604,549	614,743	594,380	1,722	1,670	1,722	1,642
Sentinel Lighting	354	355	kW	593	612	593	602	2	2	2	2
Street Lights	8,070	8,070	kW	7,030	7,030	7,030	6,912	1	1	1	1
Unmetered Scattered Load	22	23	kWh	944,731	895,217	944,731	880,159	42,942	38,922	42,942	38,268
<b>Total</b>	<b>42,050</b>	<b>42,061</b>									
	Variance			Variance		Variance		Variance		Variance	
Residential	21		kWh	7,293,852		2,321,288		238		71	
General Service < 50 kW	(17)		kWh	348,536		(1,211,773)		236		(221)	
General Service 50 to 4,999 kW	5		kW	(10,194)		(20,363)		(52)		(80)	
Sentinel Lighting	1		kW	19		9		0		0	
Street Lights	0		kW	0		(118)		0		(0)	
Unmetered Scattered Load	1		kWh	(49,514)		(64,572)		(4,020)		(4,675)	

2  
 3 When comparing the 2018 actual results to the 2018 board approved amounts, the customer/connection  
 4 forecast for 2018 was fairly consistent with 2018 actual values. The residential class had higher actual  
 5 consumption at 7.3M kWh or 2.53% more. All other classes consumption variability was insignificant.

6 **2018 Actual vs. 2019 Actual**

8 **Table 3-35: Distribution Revenue – 2018 Actual vs 2019 Actual**

Distribution Throughput Revenue	2018 Actual	2019 Actual	Difference \$	Difference %
Residential	9,190,889	11,169,040	1,978,150	21.5%
General Service <50 kW	3,119,001	3,118,156	(845)	(0.0%)
General Service 50 to 4,999 kW	4,149,200	4,411,624	262,424	6.3%
Sentinel Lighting	76,498	33,694	(42,804)	(56.0%)
Street Lighting	395,492	303,433	(92,060)	(23.3%)
Unmetered Scattered Load	29,910	35,221	5,311	17.8%
<b>Total</b>	<b>16,960,991</b>	<b>19,071,168</b>	<b>2,110,177</b>	<b>12.4%</b>

1 The 2019 throughput revenue was \$2,110,177 or 12% higher than 2018 actual revenue due to the  
 2 increase in rates being in effect for the full year. The 2019 revenue was still below the 2018 board  
 3 approved revenue mainly due to lower consumption.

4 **Table 3-36: Billing Determinants - 2018 Actual vs 2019 Actual**

Billing Quantities	Customers / Connections		Units	Volume		Volume Weather Normal		Annual Usage Per Customer / Connection		Annual Usage Per Customer / Connection Weather Normal	
	2018 Actual	2019 Actual		2018 Actual	2019 Actual	2018 Actual	2019 Actual	2018 Actual	2019 Actual	2018 Actual	2019 Actual
<b>Weather Normal Conversion Factor</b>						0.983179072	0.9731				
Residential	29,837	29,897	kWh	295,617,651	296,035,266	290,645,087	288,059,870	9,908	9,902	9,741	9,635
General Service < 50 kW	3,414	3,388	kWh	92,759,999	91,718,380	91,199,690	89,247,424	27,170	27,072	26,713	26,342
General Service 50 to 4,999 kW	362	362	kW	604,549	594,560	594,380	578,542	1,670	1,642	1,642	1,598
Sentinel Lighting	355	350	kW	612	605	602	589	2	2	2	2
Street Lights	8,070	8,037	kW	7,030	7,056	6,912	6,866	1	1	1	1
Unmetered Scattered Load	23	23	kWh	895,217	866,480	880,159	843,136	38,922	37,673	38,268	36,658
<b>Total</b>	<b>42,061</b>	<b>42,057</b>									
	Variance			Variance		Variance		Variance		Variance	
Residential	60		kWh	417,615		(2,585,217)		(6)		(106)	
General Service < 50 kW	(26)		kWh	(1,041,619)		(1,952,266)		(99)		(371)	
General Service 50 to 4,999 kW	0		kW	(9,989)		(15,838)		(28)		(44)	
Sentinel Lighting	(5)		kW	(7)		(13)		0		(0)	
Street Lights	(33)		kW	26		(46)		0		(0)	
Unmetered Scattered Load	0		kWh	(28,737)		(37,022)		(1,249)		(1,610)	

5  
 6 There is no material differences in the customer connections or usage per customer between 2018 and  
 7 2019.

8 **2019 Actual vs. 2020 Actual**

9 **Table 3-37: Distribution Revenue - 2019 Actual vs 2020 Actual**

Distribution Throughput Revenue	2019 Actual	2020 Actual	Difference \$	Difference %
Residential	11,169,040	11,478,211	309,172	2.8%
General Service <50 kW	3,118,156	3,006,431	(111,725)	(3.6%)
General Service 50 to 4,999 kW	4,411,624	4,273,136	(138,488)	(3.1%)
Sentinel Lighting	33,694	35,565	1,872	5.6%
Street Lighting	303,433	201,052	(102,380)	(33.7%)
Unmetered Scattered Load	35,221	37,840	2,619	7.4%
<b>Total</b>	<b>19,071,168</b>	<b>19,032,237</b>	<b>(38,931)</b>	<b>(0.2%)</b>

10  
 11 The 2020 throughput revenue was (\$38,931) or virtually unchanged from 2020.

1

**Table 3-38: Billing Determinants - 2019 Actual vs 2020 Actual**

Billing Quantities	Customers / Connections		Units	Volume		Volume Weather Normal		Annual Usage Per Customer / Connection		Annual Usage Per Customer / Connection Weather Normal	
	2019 Actual	2020 Actual		2019 Actual	2020 Actual	2019 Actual	2020 Actual	2019 Actual	2020 Actual	2019 Actual	2020 Actual
<b>Weather Normal Conversion Factor</b>						0.973059307	0.9888				
Residential	29,897	30,026	kWh	296,035,266	298,184,963	288,059,870	294,852,697	9,902	9,931	9,635	9,820
General Service < 50 kW	3,388	3,355	kWh	91,718,380	84,774,528	89,247,424	83,827,159	27,072	25,268	26,342	24,986
General Service 50 to 4,999 kW	362	370	kW	594,560	546,908	578,542	540,796	1,642	1,478	1,598	1,462
Sentinel Lighting	350	348	kW	605	598	589	591	2	2	2	2
Street Lights	8,037	8,037	kW	7,056	7,202	6,866	7,121	1	1	1	1
Unmetered Scattered Load	23	24	kWh	866,480	870,821	843,136	861,090	37,673	36,284	36,658	35,879
<b>Total</b>	<b>42,057</b>	<b>42,160</b>									
	Variance			Variance		Variance		Variance		Variance	
Residential	129		kWh	2,149,697		6,792,827		29		185	
General Service < 50 kW	(33)		kWh	(6,943,852)		(5,420,265)		(1,803)		(1,356)	
General Service 50 to 4,999 kW	8		kW	(47,652)		(37,746)		(164)		(137)	
Sentinel Lighting	(2)		kW	(8)		2		(0)		0	
Street Lights	0		kW	146		256		0		0	
Unmetered Scattered Load	1		kWh	4,341		17,953		(1,389)		(779)	

2

3 As outlined earlier, PUC's 2020 year was affected by the COVID-19 pandemic. There is an 8% drop in  
 4 consumption for the small and large general service rate classes. In 2020, after weather normalization,  
 5 there is still a 6% and 7% drop respectively in these classes, meaning that another outside influence  
 6 affected consumption in the year. There was also a 7% and 10% drop respectively in the usage per  
 7 customer for those rate classes. All these above findings point to the effects of COVID-19.

8 **2020 Actual vs. 2021 Actual**

9 **Table 3-39: Distribution Revenue - 2020 Actual vs 2021 Actual**

Distribution Throughput Revenue	2020 Actual	2021 Actual	Difference \$	Difference %
Residential	11,478,211	11,764,831	286,620	2.5%
General Service <50 kW	3,006,431	3,152,286	145,854	4.9%
General Service 50 to 4,999 kW	4,273,136	4,277,868	4,731	0.1%
Sentinel Lighting	35,565	36,363	798	2.2%
Street Lighting	201,052	207,431	6,379	3.2%
Unmetered Scattered Load	37,840	38,846	1,006	2.7%
<b>Total</b>	<b>19,032,237</b>	<b>19,477,625</b>	<b>445,388</b>	<b>2.3%</b>

10

1 The 2021 throughput revenue was \$445,388 or 2.0% higher than the 2020 actual revenue. The 2021  
 2 revenue includes a rate rider for foregone revenue that was delayed implementation in 2020 as a result  
 3 of the COVID-19 pandemic.

4 **Table 3-40: Billing Determinants - 2020 Actual vs 2021 Actual**  
 5 **(2020 and 2021 COVID Normalized)**  
 6

Billing Quantities	Customers / Connections		Units	Volume		Volume Weather Normal		Annual Usage Per Customer / Connection		Annual Usage Per Customer / Connection Weather Normal	
	2020 Actual	2021 Actual		2020 Actual	2021 Actual	2020 Actual	2021 Actual	2020 Actual	2021 Actual	2020 Actual	2021 Actual
<b>Weather Normal Conversion Factor</b>						0.988824836	1.0139				
Residential	30,026	30,134	kWh	298,184,963	292,492,184	294,852,697	296,547,437	9,931	9,706	9,820	9,841
General Service < 50 kW	3,355	3,423	kWh	84,774,528	88,569,433	83,827,159	89,797,402	25,268	25,875	24,986	26,234
General Service 50 to 4,999 kW	370	308	kW	546,908	536,707	540,796	544,148	1,478	1,743	1,462	1,767
Sentinel Lighting	348	330	kW	598	596	591	605	2	2	2	2
Street Lights	8,037	8,037	kW	7,202	7,202	7,121	7,302	1	1	1	1
Unmetered Scattered Load	24	24	kWh	870,821	877,918	861,090	890,090	36,284	36,580	35,879	37,087
Total	42,160	42,256									
	Variance			Variance		Variance		Variance		Variance	
Residential	108		kWh	(5,692,779)		1,694,740		(225)		21	
General Service < 50 kW	68		kWh	3,794,905		5,970,243		607		1,248	
General Service 50 to 4,999 kW	(62)		kW	(10,201)		3,352		264		305	
Sentinel Lighting	(18)		kW	(1)		14		0		0	
Street Lights	0		kW	0		180		0		0	
Unmetered Scattered Load	0		kWh	7,097		29,000		296		1,208	

7  
 8 As explained in the COVID adjustment, there is a 17.0% or 62 customer decrease in the large general  
 9 service class. All of these customers shifted to the small general service rate class. This also caused the  
 10 annual usage per customer in the large GS rate class to go up by 18.0%.

11 **2021 Actual vs. 2022 Bridge**

12 **Table 3-41: Distribution Revenue – 2021 Actual vs 2022 Bridge**

Distribution Throughput Revenue	2021 Actual	2022 Bridge	Difference \$	Difference %
Residential	11,764,831	12,893,279	1,128,447	9.6%
General Service <50 kW	3,152,286	3,401,209	248,923	7.9%
General Service 50 to 4,999 kW	4,277,868	4,903,411	625,543	14.6%
Sentinel Lighting	36,363	37,505	1,142	3.1%
Street Lighting	207,431	222,361	14,930	7.2%
Unmetered Scattered Load	38,846	42,376	3,530	9.1%
<b>Total</b>	<b>19,477,625</b>	<b>21,500,141</b>	<b>2,022,516</b>	<b>10.4%</b>



1 Throughput revenue for 2022 is forecasted to be \$2,022,516 or 10.0% higher than 2021. The 2022  
 2 revenue includes the following factors that contribute to this 10.0% increase:

- 3 • IRM inflationary increase of 3.0% or \$599,510
- 4 • ICM Rate Rider for Sault Smart Grid which totals \$875,868 in additional revenue
- 5 • forecasted consumption that returns closer to pre pandemic levels

6  
 7 **Table 3-42: Billing Determinants - 2021 Actual vs 2022 Bridge**  
 8 **(2020 and 2021 COVID Normalized)**  
 9

Billing Quantities	Customers / Connections		Units	Volume		Volume Weather Normal		Annual Usage Per Customer / Connection		Annual Usage Per Customer / Connection Weather Normal	
	2021 Actual	2022 Bridge		2021 Actual	2022 Bridge	2021 Actual	2022 Bridge	2021 Actual	2022 Bridge	2021 Actual	2022 Bridge
<b>Weather Normal Conversion Factor</b>						1.013864481	1.0143				
Residential	30,134	30,237	kWh	292,492,184	281,801,295	296,547,437	285,835,593	9,706	9,320	9,841	9,453
General Service < 50 kW	3,423	3,397	kWh	88,569,433	86,483,996	89,797,402	87,722,111	25,875	25,460	26,234	25,825
General Service 50 to 4,999 kW	308	348	kW	536,707	570,894	544,148	579,067	1,743	1,639	1,767	1,662
Sentinel Lighting	330	324	kW	596	580	605	589	2	2	2	2
Street Lights	8,037	8,037	kW	7,202	7,200	7,302	7,303	1	1	1	1
Unmetered Scattered Load	24	25	kWh	877,918	878,223	890,090	890,796	36,580	35,748	37,087	36,259
<b>Total</b>	<b>42,256</b>	<b>42,367</b>									
	Variance			Variance		Variance		Variance		Variance	
Residential	103		kWh	(10,690,889)		(10,711,843)		(387)		(388)	
General Service < 50 kW	(26)		kWh	(2,085,437)		(2,075,291)		(414)		(409)	
General Service 50 to 4,999 kW	40		kW	34,187		34,919		(104)		(104)	
Sentinel Lighting	(6)		kW	(16)		(16)		(0)		(0)	
Street Lights	0		kW	(2)		1		(0)		0	
Unmetered Scattered Load	1		kWh	305		706		(832)		(828)	

10  
 11 The only material variance is in the large general service rate class, which is projecting that the number  
 12 of customers and resulting consumption will return back to pre-pandemic levels.

1 **2022 Bridge vs. 2023 Test**

2 **Table 3-43: Distribution Revenue - 2022 Bridge vs 2023 Test**

Distribution Throughput Revenue	2022 Bridge	2023 Test	Difference \$	Difference %
Residential	12,893,279	15,291,103	2,397,824	18.6%
General Service <50 kW	3,401,209	3,768,919	367,710	10.8%
General Service 50 to 4,999 kW	4,903,411	5,498,738	595,327	12.1%
Sentinel Lighting	37,505	43,297	5,792	15.4%
Street Lighting	222,361	262,895	40,534	18.2%
Unmetered Scattered Load	42,376	50,271	7,895	18.6%
<b>Total</b>	<b>21,500,141</b>	<b>24,915,223</b>	<b>3,415,082</b>	<b>15.9%</b>

3  
 4  
 5 The proposed Test Year distribution revenue is a reflection of the 2023 COS application and the proposed  
 6 base revenue requirement of \$24,915,223. The variance in distribution revenue over the Bridge Year is a  
 7 result of the proposed increases to fixed and variable distribution revenue in the Test Year.

8 **Table 3-44: Billing Determinants - 2022 Bridge vs 2023 Test**

Billing Quantities	Customers / Connections		Units	Volume		Volume Weather Normal		Annual Usage Per Customer / Connection		Annual Usage Per Customer / Connection Weather Normal	
	2022 Bridge	2023 Test		2022 Bridge	2023 Test	2022 Bridge	2023 Test	2022 Bridge	2023 Test	2022 Bridge	2023 Test
<b>Weather Normal Conversion Factor</b>						1.01431611	0.9757				
Residential	30,237	30,340	kWh	281,801,295	274,738,681	285,835,593	268,072,180	9,320	9,055	9,453	8,836
General Service < 50 kW	3,397	3,400	kWh	86,483,996	79,051,528	87,722,111	77,133,352	25,460	23,250	25,825	22,686
General Service 50 to 4,999 kW	348	344	kW	570,894	547,687	579,067	534,398	1,639	1,592	1,662	1,553
Sentinel Lighting	324	317	kW	580	566	589	553	2	2	2	2
Street Lights	8,037	8,037	kW	7,200	7,200	7,303	7,025	1	1	1	1
Unmetered Scattered Load	25	25	kWh	878,223	878,528	890,796	857,211	35,748	35,141	36,259	34,288
<b>Total</b>	<b>42,367</b>	<b>42,463</b>									
	Variance			Variance		Variance		Variance		Variance	
Residential	103		kWh	(7,062,614)		(17,763,413)		(264)		(618)	
General Service < 50 kW	3		kWh	(7,432,469)		(10,588,759)		(2,210)		(3,139)	
General Service 50 to 4,999 kW	(4)		kW	(23,207)		(44,670)		(47)		(109)	
Sentinel Lighting	(7)		kW	(14)		(36)		(0)		(0)	
Street Lights	0		kW	0		(278)		0		(0)	
Unmetered Scattered Load	0		kWh	305		(33,585)		(607)		(1,971)	

9  
 10 There is no material differences in the customer connections between 2022 and 2023. There is a 9.0%  
 11 or 7.4M kWh drop in small general service consumption. This is due to the shift back of small general  
 12 service customers to the large general service class.

# **APPENDIX A**

## **MONTHLY DATA USED FOR REGRESSION ANALYSIS**

	<u>Purchased kWh</u>	<u>Heating Degree Days</u>	<u>Cooling Degree Days</u>	<u>Spring Fall Flag</u>	<u>Number of Days in Month</u>	<u>Trend</u>	<u>Number of Customers</u>	<u>Predicted Purchases</u>
Jan-11	83,643,833	935.0	-	-	31.00	1	33,040	81,611,129
Feb-11	72,687,185	732.3	-	-	28.00	2	33,045	69,285,410
Mar-11	72,688,244	699.2	-	1.00	31.00	3	33,047	70,381,930
Apr-11	60,902,854	444.6	-	1.00	30.00	4	33,047	59,664,918
May-11	52,597,908	221.9	3.2	1.00	31.00	5	33,046	53,891,242
Jun-11	48,777,799	99.4	2.7	-	30.00	6	33,056	50,569,605
Jul-11	54,638,457	14.0	73.6	-	31.00	7	33,071	57,940,637
Aug-11	54,146,196	24.2	35.4	-	31.00	8	33,098	53,533,313
Sep-11	52,585,712	129.6	11.0	1.00	30.00	9	33,126	49,628,689
Oct-11	56,921,149	269.5	1.5	1.00	31.00	10	33,143	55,018,889
Nov-11	61,640,573	428.9	-	1.00	30.00	11	33,199	58,645,655
Dec-11	73,819,284	650.4	-	-	31.00	12	33,248	70,887,721
Jan-12	73,790,226	756.8	-	-	31.00	13	33,203	74,558,153
Feb-12	68,046,427	622.6	-	-	29.00	14	33,203	66,351,923
Mar-12	64,860,708	479.7	-	1.00	31.00	15	33,203	61,879,698
Apr-12	55,490,558	437.5	-	1.00	30.00	16	33,210	58,617,250
May-12	50,211,578	188.3	11.0	1.00	31.00	17	33,210	52,866,598
Jun-12	50,441,593	59.1	33.7	-	30.00	18	33,210	52,163,817
Jul-12	52,218,431	9.5	68.7	-	31.00	19	33,212	56,379,445
Aug-12	51,797,361	34.3	37.7	-	31.00	20	33,212	53,374,318
Sep-12	49,181,637	181.9	5.3	1.00	30.00	21	33,212	49,968,125
Oct-12	55,200,719	343.9	-	1.00	31.00	22	33,055	56,658,033
Nov-12	63,048,824	481.9	-	1.00	30.00	23	33,055	59,718,834
Dec-12	72,665,451	445.9	-	-	31.00	24	33,055	62,926,966
Jan-13	77,430,385	798.2	-	-	31.00	25	33,306	75,215,328
Feb-13	69,794,850	786.1	-	-	28.00	26	33,306	69,578,670
Mar-13	69,264,159	722.5	-	1.00	31.00	27	33,306	69,603,904
Apr-13	62,490,524	495.7	-	1.00	30.00	28	33,294	59,865,552
May-13	51,260,742	248.4	3.0	1.00	31.00	29	33,294	53,201,404
Jun-13	48,246,051	106.2	12.4	-	30.00	30	33,294	50,408,116
Jul-13	52,370,705	47.8	50.3	-	31.00	31	33,515	54,657,526
Aug-13	51,254,455	57.7	31.4	-	31.00	32	33,515	52,616,291
Sep-13	48,184,318	165.6	5.8	1.00	30.00	33	33,515	48,653,029
Oct-13	54,286,247	326.1	-	1.00	31.00	34	33,393	55,225,974
Nov-13	64,675,563	543.7	-	1.00	30.00	35	33,393	61,083,666
Dec-13	81,310,312	874.5	-	-	31.00	36	33,393	77,164,076
Jan-14	84,076,331	980.3	-	-	31.00	37	33,166	80,821,274
Feb-14	73,283,050	912.0	-	-	28.00	38	33,166	73,212,972
Mar-14	75,936,435	895.0	-	1.00	31.00	39	33,166	74,874,661
Apr-14	60,945,928	511.1	-	1.00	30.00	40	33,415	59,608,741
May-14	53,127,584	267.9	0.8	1.00	31.00	41	33,415	52,820,332
Jun-14	47,524,355	96.9	12.0	-	30.00	42	33,415	49,235,841
Jul-14	48,026,904	88.1	6.4	-	31.00	43	33,400	49,887,969
Aug-14	48,878,137	63.4	13.5	-	31.00	44	33,400	49,828,315
Sep-14	47,959,876	158.2	1.4	1.00	30.00	45	33,400	47,065,628
Oct-14	54,613,898	341.0	-	1.00	31.00	46	33,513	54,953,632
Nov-14	64,852,403	616.1	-	1.00	30.00	47	33,513	62,828,156
Dec-14	71,265,383	691.4	-	-	31.00	48	33,513	69,940,967
Jan-15	79,807,046	954.2	-	-	31.00	49	33,539	79,097,710
Feb-15	75,728,990	1,015.2	-	-	28.00	50	33,539	76,027,611
Mar-15	70,753,091	786.6	-	1.00	31.00	51	33,539	70,262,513
Apr-15	57,109,492	474.4	-	1.00	30.00	52	33,261	57,535,794
May-15	49,113,111	242.9	1.1	1.00	31.00	53	33,261	51,194,931
Jun-15	46,018,522	141.8	0.4	-	30.00	54	33,261	48,600,229
Jul-15	50,056,826	52.6	29.2	-	31.00	55	33,371	50,655,933
Aug-15	49,818,190	37.5	35.6	-	31.00	56	33,371	50,847,129
Sep-15	48,683,583	75.5	31.4	1.00	30.00	57	33,371	47,062,481
Oct-15	52,100,033	331.2	-	1.00	31.00	58	33,411	53,822,592
Nov-15	55,680,534	413.0	-	1.00	30.00	59	33,411	54,912,627
Dec-15	63,647,960	541.2	-	-	31.00	60	33,411	63,882,134
Jan-16	71,224,983	794.2	-	-	31.00	61	33,412	72,695,990
Feb-16	65,961,523	731.2	-	-	29.00	62	33,412	66,988,754
Mar-16	61,438,716	588.8	-	1.00	31.00	63	33,412	62,534,079
Apr-16	55,510,528	499.7	-	1.00	30.00	64	33,360	57,628,060
May-16	47,972,678	241.2	3.5	1.00	31.00	65	33,360	50,634,721
Jun-16	46,020,697	116.8	10.2	-	30.00	66	33,360	48,132,354
Jul-16	50,843,952	27.2	44.2	-	31.00	67	33,412	50,816,059
Aug-16	52,655,660	17.1	51.7	-	31.00	68	33,412	51,318,035
Sep-16	47,273,740	65.1	13.5	1.00	30.00	69	33,412	43,696,567

	Purchased kWh	Heating Degree Days	Cooling Degree Days	Spring Fall Flag	Number of Days in Month	Trend	Number of Customers	Predicted Purchases
Oct-16	50,073,798	277.4	-	1.00	31.00	70	33,513	51,138,459
Nov-16	53,720,228	485.6	-	1.00	30.00	71	33,513	56,665,613
Dec-16	67,261,960	640.7	-	-	31.00	72	33,513	66,577,859
Jan-17	66,674,271	710.9	-	-	31.00	73	33,528	68,975,857
Feb-17	59,162,719	638.7	-	-	28.00	74	33,528	61,230,672
Mar-17	63,923,197	706.2	-	1.00	31.00	75	33,528	65,858,162
Apr-17	51,461,055	392.1	-	1.00	30.00	76	33,482	53,054,782
May-17	48,082,511	273.8	-	1.00	31.00	77	33,482	50,551,751
Jun-17	44,830,072	104.1	3.5	-	30.00	78	33,482	46,065,867
Jul-17	48,264,067	42.0	13.8	-	31.00	79	33,516	46,800,689
Aug-17	47,137,204	58.4	9.2	-	31.00	80	33,516	46,742,837
Sep-17	46,024,413	112.7	33.3	1.00	30.00	81	33,516	47,012,657
Oct-17	48,274,780	266.3	1.9	1.00	31.00	82	33,605	50,187,131
Nov-17	58,218,614	540.9	-	1.00	30.00	83	33,605	57,808,670
Dec-17	70,917,570	849.9	-	-	31.00	84	33,605	73,125,694
Jan-18	71,561,357	860.4	-	-	31.00	85	33,637	74,426,894
Feb-18	62,600,141	769.0	-	-	28.00	86	33,637	65,007,823
Mar-18	61,919,235	737.7	-	1.00	31.00	87	33,637	66,167,607
Apr-18	55,872,651	585.9	-	1.00	30.00	88	33,637	59,058,694
May-18	47,195,638	214.0	5.6	1.00	31.00	89	33,637	48,343,493
Jun-18	45,395,013	104.5	17.1	-	30.00	90	33,637	46,954,440
Jul-18	50,885,922	19.6	59.6	-	31.00	91	33,637	50,850,756
Aug-18	49,660,000	24.6	45.5	-	31.00	92	33,637	49,226,136
Sep-18	45,784,881	135.0	22.5	1.00	30.00	93	33,637	45,670,393
Oct-18	51,981,748	389.2	-	1.00	31.00	94	33,637	53,472,430
Nov-18	59,277,771	604.1	-	1.00	30.00	95	33,637	59,235,795
Dec-18	64,601,941	686.6	-	-	31.00	96	33,637	66,601,313
Jan-19	72,715,952	966.9	-	-	31.00	97	33,670	76,371,975
Feb-19	62,812,602	802.3	-	-	28.00	98	33,670	65,383,713
Mar-19	63,697,945	764.0	-	1.00	31.00	99	33,670	66,297,809
Apr-19	54,097,055	461.0	-	1.00	30.00	100	33,670	53,882,042
May-19	48,408,149	332.6	-	1.00	31.00	101	33,670	51,024,519
Jun-19	44,308,321	126.3	6.6	-	30.00	102	33,670	45,635,307
Jul-19	49,411,220	26.3	41.7	-	31.00	103	33,670	48,091,516
Aug-19	46,460,129	52.5	7.4	-	31.00	104	33,670	44,726,584
Sep-19	43,739,956	128.3	6.8	1.00	30.00	105	33,670	42,711,413
Oct-19	50,062,807	352.3	-	1.00	31.00	106	33,670	51,386,178
Nov-19	59,303,580	615.1	-	1.00	30.00	107	33,670	58,828,994
Dec-19	65,621,798	713.2	-	-	31.00	108	33,670	66,742,044
Jan-20	66,610,656	708.5	-	-	31.00	109	33,775	66,506,613
Feb-20	63,240,830	755.4	-	-	28.00	110	33,798	62,940,640
Mar-20	61,247,214	638.2	-	1.00	31.00	111	33,798	61,085,485
Apr-20	53,304,894	489.5	-	1.00	30.00	112	33,798	54,083,621
May-20	49,102,694	286.7	12.7	1.00	31.00	113	33,798	50,178,514
Jun-20	46,184,027	101.5	15.7	-	30.00	114	33,798	45,087,112
Jul-20	52,834,439	12.3	62.4	-	31.00	115	33,798	49,349,063
Aug-20	49,467,686	38.3	30.7	-	31.00	116	33,798	46,296,886
Sep-20	44,701,634	181.5	-	1.00	30.00	117	33,798	42,945,343
Oct-20	52,557,235	410.8	-	1.00	31.00	118	33,798	52,642,459
Nov-20	55,175,518	437.5	-	1.00	30.00	119	33,798	51,798,581
Dec-20	64,641,769	668.3	-	-	31.00	120	33,798	64,369,168
Jan-21	65,078,364	738	-	-	31.00	121	33,905	66,744,959
Feb-21	62,543,997	800	-	-	28.00	122	33,905	63,702,938
Mar-21	61,303,952	600	-	1.00	31.00	123	33,905	58,934,630
Apr-21	50,610,121	393	-	1.00	30.00	124	33,905	49,897,946
May-21	46,990,075	266	7	1.00	31.00	125	33,905	47,970,685
Jun-21	46,876,886	71	25	-	30.00	126	33,905	44,385,446
Jul-21	49,479,150	34	28	-	31.00	127	33,905	45,048,626
Aug-21	52,448,762	8	69	-	31.00	128	33,905	49,109,188
Sep-21	44,433,578	118	3	1.00	30.00	129	33,905	40,250,874
Oct-21	48,204,018	209	3	1.00	31.00	130	33,905	45,136,066
Nov-21	55,185,303	500	-	1.00	30.00	131	33,905	53,210,197
Dec-21	64,586,731	649	-	-	31.00	132	33,905	62,902,728

	<u>Purchased kWh</u>	<u>Heating Degree Days</u>	<u>Cooling Degree Days</u>	<u>Spring Fall Flag</u>	<u>Number of Days in Month</u>	<u>CDM Activity</u>	<u>Number of Customers</u>	<u>Predicted Purchases</u>
Jan-15	79,807,046	923.4	-	-	31.00	1,849,138	33,539	81,336,085
Feb-15	75,728,990	1,015.2	-	-	28.00	1,839,519	33,539	79,578,487
Mar-15	70,753,091	786.6	-	1.00	31.00	1,829,900	33,539	73,065,753
Apr-15	57,109,492	474.4	-	1.00	30.00	1,820,281	33,261	58,127,899
May-15	49,113,111	242.9	1.1	1.00	31.00	1,810,663	33,261	50,855,652
Jun-15	46,018,522	141.8	0.4	-	30.00	1,801,044	33,261	47,886,293
Jul-15	50,056,826	52.6	29.2	-	31.00	1,791,425	33,371	48,901,672
Aug-15	49,818,190	37.5	35.6	-	31.00	1,781,806	33,371	48,875,258
Sep-15	48,683,583	75.5	31.4	1.00	30.00	1,772,187	33,371	45,358,655
Oct-15	52,100,033	331.2	-	1.00	31.00	1,762,568	33,411	54,848,251
Nov-15	55,680,534	413.0	-	1.00	30.00	1,752,949	33,411	56,324,297
Dec-15	63,647,960	541.2	-	-	31.00	1,743,330	33,411	66,174,312
Jan-16	71,224,983	794.2	-	-	31.00	1,827,421	33,412	75,939,663
Feb-16	65,961,523	731.2	-	-	28.00	1,911,513	33,412	67,674,530
Mar-16	61,438,716	588.8	-	1.00	31.00	1,995,604	33,412	64,248,681
Apr-16	55,510,528	499.7	-	1.00	30.00	2,079,695	33,360	58,439,986
May-16	47,972,678	241.2	3.5	1.00	31.00	2,163,786	33,360	49,950,285
Jun-16	46,020,697	116.8	8.6	-	30.00	2,247,878	33,360	46,197,294
Jul-16	50,843,952	27.2	44.2	-	31.00	2,331,969	33,412	47,273,010
Aug-16	52,655,660	17.1	51.7	-	31.00	2,416,060	33,412	47,193,536
Sep-16	47,273,740	65.1	12.8	1.00	30.00	2,500,152	33,412	40,806,014
Oct-16	50,073,798	277.4	-	1.00	31.00	2,584,243	33,513	49,950,287
Nov-16	53,720,228	485.6	-	1.00	30.00	2,668,334	33,513	56,114,410
Dec-16	67,261,960	640.7	-	-	31.00	2,752,425	33,513	66,688,933
Jan-17		830.8	-	-	31.00	2,702,650	33,508	73,989,996
Feb-17		774.6	-	-	29.00	2,652,875	33,508	68,303,227
Mar-17		674.2	-	1.00	31.00	2,603,100	33,508	65,227,719
Apr-17		433.9	0.0	1.00	30.00	2,553,325	33,456	53,891,097
May-17		225.3	5.2	1.00	31.00	2,503,550	33,456	48,018,287
Jun-17		98.1	12.8	-	30.00	2,453,775	33,456	44,860,796
Jul-17		40.4	38.9	-	31.00	2,404,000	33,508	46,896,026
Aug-17		39.9	37.1	-	31.00	2,354,225	33,508	46,912,639
Sep-17		130.9	10.0	1.00	30.00	2,304,450	33,508	43,716,815
Oct-17		302.9	0.4	1.00	31.00	2,254,675	33,609	52,020,549
Nov-17		484.4	-	1.00	30.00	2,204,900	33,609	57,586,023
Dec-17		688.9	-	-	31.00	2,155,125	33,609	70,620,807
Jan-18		830.8	-	-	31.00	2,180,816	33,604	76,162,141
Feb-18		774.6	-	-	28.00	2,206,508	33,604	68,381,812
Mar-18		674.2	-	1.00	31.00	2,232,199	33,604	66,844,497
Apr-18		433.9	0.0	1.00	30.00	2,257,890	33,552	55,229,800
May-18		225.3	5.2	1.00	31.00	2,283,582	33,552	49,079,307
Jun-18		98.1	12.8	-	30.00	2,309,273	33,552	45,644,132
Jul-18		40.4	38.9	-	31.00	2,334,965	33,604	47,402,072
Aug-18		39.9	37.1	-	31.00	2,360,656	33,604	47,141,001
Sep-18		130.9	10.0	1.00	30.00	2,386,347	33,604	43,667,494
Oct-18		302.9	0.4	1.00	31.00	2,412,039	33,706	51,694,306
Nov-18		484.4	-	1.00	30.00	2,437,730	33,706	56,982,097
Dec-18		688.9	-	-	31.00	2,463,422	33,706	69,739,198