EXHIBIT 3:

OPERATING REVENUE

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2.3. EXHIBIT 3: OPERATING REVENUE

2.3.1 LOAD AND REVENUE FORECAST

This Exhibit provides the details of North Bay Hydro Distribution Ltd.'s ("NBHDL") operating revenue for 2015 Board Approved, 2015 to 2019 Actuals, the 2020 Bridge Year and the 2021 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. NBHDL notes that standard accounting practice is to record positive revenue transactions as negative integers or credits. In this Exhibit, however, NBHDL has presented revenues as positive integers for presentation purposes only.

NBHDL is proposing a total Service Revenue Requirement of $15,685,587 for the 2021 Test Year. This amount includes a Base Revenue Requirement of $14,457,121 plus revenue offsets of $1,228,466 to be recovered through Other Revenue.

Other Revenues include Late Payment charges, Specific Service charges, Rent from Electric Property, Miscellaneous Service revenues, Standard Supply Service ("SSS") Administrative charges and Interest. A summary of these operating revenues together is presented with a materiality analysis of variances is presented in Table 3-44.

The following Table 3-1 summarizes NBHDL's total operating revenue. Revenue for each of the actual years is from NBHDL's audited Financial Statements which reconcile to the annual filings with the OEB**.** The 2020 Bridge year is comprised of actual revenue from January to May 2020. The remainder of the year is based on a seven-month projection of distribution revenue from existing distribution rates and other distribution revenue. The 2020 distribution revenue estimate is reflective of NBHDL's decision to defer May 1, 2020 increases to November 1st and forego recovery of increased revenue from May through October. This decision was made in an effort to provide customers with additional rate relief during the height of the COVID-19 pandemic. The 2021 Test year distribution revenue is provided on the basis of both existing and proposed distribution rates. Revenue for the GS>50 kW and Intermediate rate classes is net of transformer allowance credits to eligible customers within these rate classes.

Table 3 - 1: Summary of Operating Revenue

Description	2015 Board Approved	2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge	2021 Test - Existing Rates	2021 Test - Proposed Rates
Distribution Revenues									
Residential	6,869,445	6,746,588	6,786,338	6,978,369	7,247,834	7,232,640	7,265,493	7,479,179	8,839,633
General Service < 50 kW	2,274,362	2,273,518	2,190,672	2,218,037	2,313,988	2,259,697	2,220,329	2,312,188	2,634,802
General Service 50 to 2999 kW	2,061,696	1,985,500	2,034,152	2,165,452	2,172,131	2,200,759	2,214,842	2,282,752	2,683,554
General Service 3000 to 4999 kW	93,913	89,460	89,683	92,189	96,389	95,341	99,100	98,093	111,780
Street Lighting	449,705	454,386	456,778	463,668	468,216	467,009	474,864	483,854	147,909
Sentinel Lighting	43,209	38,317	32,489	31,132	30,533	29,926	28,084	29,781	38,348
Unmetered Scattered Load	814	1,275	1,140	1,152	1,146	1,126	1,116	1,099	1,095
Distribution Revenue	11,793,143	11,589,043	11,591,252	11,950,000	12,330,237	12,286,498	12,303,828	12,686,946	14,457,121
Other Revenue									
Late Payment Charges	138,983	144,454	145,466	161,685	152,362	134,994	77,754	150,473	150,473
Specific Service Charges	591,356	616,193	579,684	437,297	358,852	214,871	144,519	144,519	144,519
Other Distribution Revenue	282,042	400,010	345,867	346,717	332,509	353,698	349,086	610,768	610,768
Other Income and Expenses	161,553	119,186	968,364	1,056,828	18,657	354,138	404,386	322,705	322,705
Other Revenue	1,173,934	1,279,843	2,039,381	2,002,526	862,379	1,057,701	975,746	1,228,465	1,228,465
Total Operating Revenue	12,967,077	12,868,886	13,630,633	13,952,526	13,192,616	13,344,198	13,279,573	13,915,411	15,685,586

2.3.2 SUMMARY OF LOAD AND CUSTOMER/CONNECTION FORECAST

The purpose of this evidence is to present the process used by NBHDL to prepare the weather normalized load and customer/connection forecast used to design the proposed 2021 distribution rates.

In summary, as a starting point NBHDL used the same regression analysis methodology approved by the Board in its 2015 Cost of Service ("COS") application (EB-2014-0099) and updated the analysis for actual power purchases to the end of the 2019. As described below, the updated regression analysis excluded some variables used in the 2015 COS. The regression analysis used in this application has also been used by a number of distributors in more recent cost of service rate applications to determine a prediction model. With regard to the overall process of load forecasting, NBHDL believes that conducting a regression analysis on historical electricity purchases to produce an equation that will predict purchases is appropriate. NBHDL has the data for the amount of electricity (in kWh) purchased from the IESO for use by NBHDL's customers. With a regression analysis, these purchases can be related to other monthly explanatory variables such as heating degree days and cooling degree days which occur in the same month. The results of the regression analysis produce an equation that predicts the purchases based on the explanatory variables. This prediction model is then used as the basis to forecast the total level of weather normalized purchases for the Bridge Year and the Test Year which is converted to billed kWh by rate class. A detailed explanation of the process is provided later in this evidence.

In addition, Board staff and Intervenors have previously expressed concerns that a regression analysis assigned coefficients to some variables that were counter intuitive. For example, the customer variable would have a negative coefficient assigned to it which meant as the number of customers increased the energy forecast would decrease. Further, the regression analysis indicated that some of the variables used in the load forecasting formula were not statistically significant and should not have been included in the equation. As mentioned above, NBHDL used the regression analysis used to support the load forecast in the 2015 COS application as a starting point and addressed these concerns in the load forecast used in this Application. As a result, the previously used variable of a "North Bay Economy" flag was tested and not used as it was found to have a decreasing predictive output.

Based on the Board's approval of this methodology in a number of previous COS applications as well as the discussion that follows, NBHDL submits the load forecasting methodology is reasonable at this time for the purposes of this application.

The following provides the material to support the weather normalized load forecast used by NBHDL in this application.

Table 3-2, 3-3 and 3-5 below provide a summary of the weather normalized load and customer/connection forecast used in this application.

Table 3 - 2: Summary of Load and Customer/Connection Forecast

Year	Billed (GWh)	Growth (GWh)	Percent Change	Customer/ Connection Count	Growth	Percent Change (%)
Billed Energy (GWh) and Customer Count / Connections						
2015 Board Approved	520.5			29,878		
2010 Actual	566.7			29,956		
2011 Actual	564.9	(1.8)	(0.3%)	30,055	99.0	0.3%
2012 Actual	548.3	(16.6)	(2.9%)	30,013	(42.0)	(0.1%)
2013 Actual	548.2	(0.1)	(0.0%)	30,030	17.0	0.1%
2014 Actual	538.0	(10.2)	(1.9%)	29,885	(145.0)	(0.5%)
2015 Actual	516.7	(21.3)	(4.0%)	29,857	(28.0)	(0.1%)
2016 Actual	488.8	(28.0)	(5.4%)	29,964	107.0	0.4%
2017 Actual	482.4	(6.4)	(1.3%)	29,977	13.0	0.0%
2018 Actual	497.0	14.6	3.0%	30,001	24.0	0.1%
2019 Actual	495.8	(1.2)	(0.2%)	30,047	46.0	0.2%
2020 Bridge - Normalized	491.9	(3.8)	(0.7%)	30,075	28.0	0.1%
2021 Test - Normalized	491.1	(0.8)	(0.2%)	30,104	29.0	0.1%

In the above table 2010 to 2019 are reflecting actual weather conditions in the year. 2021 and 2020 are weather normalized. It is NBHDL's understanding that there is not a Board approved method to weather normalize actual data. Consequently, NBHDL does not have a process to adjust weather actual data to a weather normal basis. However, based on the process outlined in this Exhibit, a process to forecast energy on a weather normalized basis has been developed and used in this application.

Customer/Connection values are on a 12-month average basis and street lights, sentinel lights and unmetered loads are measured as connections.

On a rate class basis, the actual and forecasted billed amounts as well as the actual and forecasted number of customers/connections are shown in Table 3-3 and customer/connection usage is shown in Table 3-4.

Table 3 - 3: Billed Energy and Number of Customers/Connections by Rate Class

Year	Residential	General Service < 50 kW	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	Unmetered Scattered Load	Total
Billed Energy (GWh)								
2015 Board Approved	205.5	85.4	209.9	17.3	2.0	0.4	0.0	520.5
2010 Actual	206.5	85.0	230.0	41.0	3.3	0.6	0.2	566.7
2011 Actual	207.4	85.0	231.7	37.1	3.2	0.5	0.1	564.9
2012 Actual	200.6	84.9	223.7	35.7	2.8	0.5	0.1	548.3
2013 Actual	207.8	85.1	216.6	35.8	2.3	0.4	0.1	548.2
2014 Actual	206.0	85.4	217.2	26.9	2.0	0.4	0.1	538.0
2015 Actual	196.7	83.6	216.2	17.7	2.0	0.4	0.0	516.7
2016 Actual	188.2	80.6	200.9	16.8	2.0	0.2	0.0	488.8
2017 Actual	184.5	78.8	200.3	16.5	2.0	0.1	0.0	482.4
2018 Actual	196.8	81.8	200.0	16.2	2.0	0.1	0.0	497.0
2019 Actual	197.8	80.4	200.0	15.4	2.0	0.1	0.0	495.8
2020 Bridge - Normalized	199.7	79.6	195.5	14.9	2.0	0.1	0.0	491.9
2021 Test - Normalized	201.7	79.0	193.7	14.5	2.0	0.1	0.0	491.1

Number of Customers/Connections								
2015 Board Approved	21,124	2,668	247	1	5,419	412	7	29,878
2010 Actual	20,952	2,633	269	2	5,572	509	19	29,956
2011 Actual	21,096	2,623	268	2	5,574	474	18	30,055
2012 Actual	21,074	2,645	254	2	5,574	447	17	30,013
2013 Actual	21,108	2,649	255	2	5,574	427	15	30,030
2014 Actual	21,117	2,657	252	2	5,419	427	11	29,885
2015 Actual	21,122	2,646	254	1	5,422	402	10	29,857
2016 Actual	21,173	2,659	253	1	5,424	444	10	29,964
2017 Actual	21,192	2,653	261	1	5,424	436	10	29,977
2018 Actual	21,229	2,654	258	1	5,424	425	10	30,001
2019 Actual	21,280	2,653	263	1	5,424	417	9	30,047
2020 Bridge - Normalized	21,316	2,651	266	1	5,424	408	9	30,075
2021 Test - Normalized	21,352	2,649	269	1	5,424	400	9	30,104

Table 3 - 4: Annual Usage per Customer/Connection by Rate Class

Year	Residential	General Service < 50 kW	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	Unmetered Scattered Load
Energy Usage per Customer/Connection (kWh per customer/connection)							
2015 Board Approved	9,728	31,994	849,735	17,254,810	373	985	4,578
2010 Actual	9,858	32,299	855,159	20,514,052	597	1,119	8,691
2011 Actual	9,829	32,414	864,430	18,543,426	575	1,016	4,671
2012 Actual	9,520	32,117	880,663	17,861,386	501	1,091	5,222
2013 Actual	9,845	32,133	849,468	17,887,518	421	1,040	5,939
2014 Actual	9,753	32,130	862,048	13,463,278	374	993	4,601
2015 Actual	9,314	31,583	851,334	17,738,636	376	930	4,293
2016 Actual	8,888	30,328	793,994	16,805,472	377	352	4,293
2017 Actual	8,708	29,693	767,610	16,522,752	375	296	4,293
2018 Actual	9,270	30,827	775,189	16,185,720	375	293	4,207
2019 Actual	9,297	30,309	760,279	15,352,960	375	294	4,388
2020 Bridge - Normalized	9,368	30,040	734,976	14,897,244	375	294	4,388
2021 Test - Normalized	9,447	29,836	720,065	14,455,054	375	294	4,388

Annual Growth Rate in Usage per Customer/Connection							
2015 Board Approved vs 2015 Actual	4.4%	1.3%	-0.2%	-2.7%	-0.8%	5.9%	6.6%
2010 Actual							
2011 Actual	-0.3%	0.4%	1.1%	-9.6%	-3.6%	-9.2%	-46.3%
2012 Actual	-3.2%	-0.9%	1.9%	-3.7%	-12.9%	7.4%	11.8%
2013 Actual	3.4%	0.0%	-3.5%	0.1%	-15.8%	-4.7%	13.7%
2014 Actual	-0.9%	0.0%	1.5%	-24.7%	-11.2%	-4.5%	-22.5%
2015 Actual	-4.5%	-1.7%	-1.2%	31.8%	0.4%	-6.3%	-6.7%
2016 Actual	-4.6%	-4.0%	-6.7%	-5.3%	0.3%	-62.2%	0.0%
2017 Actual	-2.0%	-2.1%	-3.3%	-1.7%	-0.3%	-15.9%	0.0%
2018 Actual	6.4%	3.8%	1.0%	-2.0%	-0.2%	-0.9%	-2.0%
2019 Actual	0.3%	-1.7%	-1.9%	-5.1%	0.2%	0.1%	4.3%
2020 Bridge - Normalized	0.8%	-0.9%	-3.3%	-3.0%	0.0%	0.0%	0.0%
2021 Test - Normalized	0.8%	-0.7%	-2.0%	-3.0%	0.0%	0.0%	0.0%

2.3.3 FORECAST METHODOLOGY – MULTIVARIATE REGRESSION MODEL

NBHDL's weather normalized load forecast is developed in a three-step process. First, a total system weather normalized purchased energy forecast is developed based on multivariate regression model that incorporates historical load, weather, and seasonal data. Second, the weather normalized purchased energy forecast is adjusted by a historical loss factor to produce a weather normalized billed energy 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 that has been determined from the regression model. The forecast of customers by rate class is determined using a geometric mean analysis. The forecast is also adjusted for expected CDM results for 2020 and 2021. For those rate classes that use kW for 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.

2.3.3.1 Purchased kWh Load Forecast

An equation to predict total system purchased energy is developed using a multivariate regression model with the following independent variables: weather (heating and cooling degree days), days in a month, and a spring/fall seasonal flag. The regression model uses monthly kWh and monthly values of independent variables from January 2015 to December 2019 to determine the monthly regression coefficients.

While a five-year regression analysis is shorter than the more common ten, fifteen, and twenty-year regressions, NBHDL submits that this is appropriate. When analyzing data and the proposed variables to be used in the forecast NBHDL found that there was a sharp decline in the predictive capability of weather variables when looking back past five years. NBHDL conducted regression models using both ten and fifteen years in addition to the submitted five-year analysis. These two alternatives were ultimately rejected as the R-Square value was 80%, signifying an unreliable proportion of the kWh purchases that can be explained using the proposed variables. Further, the monthly Mean Absolute Percentage Error (MAPE) was 6.3% for both data sets, as compared to 2.3% in the chosen model. This signifies lesser variability month-to-month in the predictive model. Lastly, in both rejected cases the predictive equation produced was consistently and considerably underpredicting power purchases up until 2015 and over predicting purchases thereafter. These outputs led NBHDL to choose the 2015-2019 period for the regression as the shorter data set had a better predictive relationship. See Table 3-5 below for the regression statistics of the rejected models in comparison to the chosen model.

In accordance with the filing requirement NBHDL used a 10-year average for heating and cooling degrees days when calculating the purchases for the forecasted years. NBHDL has also provided sensitivity analysis showing the impact on the 2021 forecast of purchases assuming weather normal conditions is based on a 20-year trend of weather data.

The multivariate regression model has determined drivers of year-over-year changes in NBHDL's load growth are weather, and “calendar” variables. These factors are captured within the multivariate regression model.

Weather impacts on load are apparent in both the winter heating season, and in the summer cooling season. For that reason, both Heating Degree Days (i.e., a measure of coldness in winter) and Cooling Degree Days (i.e., a measure of summer heat) are modeled. The second main factor determining energy use in the monthly model can be classified as "calendar factors". For example, the number of days in a particular month will impact energy use. The modeling of purchased energy uses number of days in the month and a “flag” variable to capture the typically lower usage in the spring and fall months.

The following outlines the predication model used by NBHDL to predict weather normal purchases for 2020 and 2021:

NBHDL Monthly Predicted kWh Purchases
= Heating Degree Days * 21,936
+ Cooling Degree Days * 109,602
+ Number of Days in the Month * 861,014
+ Spring Fall Flag * (2,083,215)
+ Constant of 6,937,297

The monthly data used in the regression model and the resulting monthly prediction for the actual and forecasted years are provided in Appendix 3-A.

The sources of data for the various data points are:

a) Environment Canada website for monthly heating degree days and cooling degree days. Data for the North Bay Airport weather station was used. 18° C is the base numbers from which heating degree days and cooling degree days are measured.
b) The calendar provided information related to number of days in the month and the spring/fall flag.

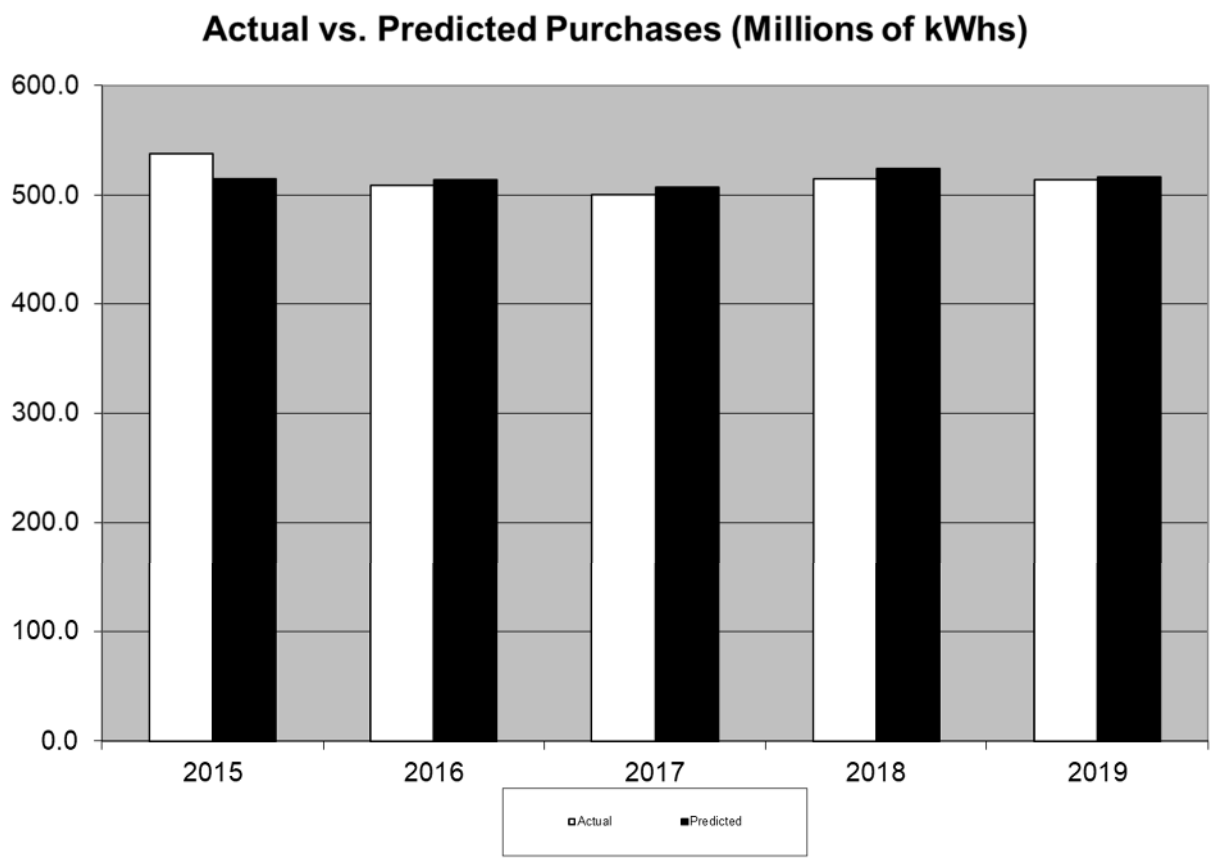
The prediction formula has the following statistical results which generally indicate the formula has a very good fit to the actual data set.

Table 3 - 5: Statistical Results

5-Year - APPLIED	Value	10-Year - REJECTED	Value	15-Year - REJECTED	Value
R Square	95.7%	R Square	79.9%	R Square	79.6%
Adjusted R Square	95.4%	Adjusted R Square	79.3%	Adjusted R Square	79.2%
F Test	307.3	F Test	114.6	F Test	171.2
MAPE (Monthly)	2.3%	MAPE (Monthly)	6.3%	MAPE (Monthly)	6.3%
T-stats by Coefficient		T-stats by Coefficient		T-stats by Coefficient	
Heating Degree Days	29.3	Heating Degree Days	17.4	Heating Degree Days	20.5
Cooling Degree Days	8.9	Cooling Degree Days	5.0	Cooling Degree Days	5.3
Number of Days in Month	3.8	Number of Days in Month	2.6	Number of Days in Month	3.3
Spring Fall Flag	(5.1)	Spring Fall Flag	(2.8)	Spring Fall Flag	(3.2)
Constant	1.0	Constant	0.5	Constant	0.5

The annual results of the above prediction formula compared to the actual annual purchases from 2015 to 2019 are shown in the Figure 3-1 below.

Figure 3 - 1 – Annual vs. Predicted Purchase from 2015 to 2019



The following Table 3-6 outlines the data that supports the above chart. In addition, the predicted total system purchases for NBHDL are provided for 2020 and 2021 on a weather normal basis. In addition, values for 2021 are provided on a 20-year trend assumption for weather normalization.

Table 3 - 6: Total System Purchase

Year	Actual	Predicted	% Difference
Purchased Energy (GWh)			
2010	592.1	589.4	(0.5%)
2011	593.7	592.9	(0.1%)
2012	572.6	526.8	(8.0%)
2013	573.2	536.5	(6.4%)
2014	561.2	536.4	(4.4%)
2015	538.3	514.9	(4.4%)
2016	509.0	513.9	1.0%
2017	500.7	507.1	1.3%
2018	514.9	524.5	1.9%
2019	514.1	516.6	0.5%
2020 Bridge - Normalized		513.8	
2021 Test - Normalized		512.9	
2021 Test - Normalized - 20 year trend		513.3	

The weather normalized amount for 2021 is determined by using 2021 dependent variables in the prediction formula on a monthly basis along with the average monthly heating degree days and cooling degree days which has occurred from January 2010 to December 2019 (i.e., 10 years). As per the filing requirements, the 2021 weather normal 20-year trend value reflects the trend in monthly heating degree days and cooling degree days which has occurred from January 2000 to December 2019.

2.3.3.2 Billed kWh Load Forecast

To determine the total weather normalized energy billed forecast, the total system weather normalized purchases forecast is adjusted by a historical loss factor. The historical loss factor used is 3.88% which represents the 5-year average loss factor for 2015 to 2019. This compares favorably to the historical loss factor in NBHDL's previous COS filing of 4.71%.

2.3.3.3 Billed kWh Load Forecast and Customer/Connection Forecast by Rate Class

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

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

Table 3 - 7: Historical Customer/Connection Data

Year	Residential	General Service < 50 kW	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	Unmetered Scattered Load	Total
Number of Customers/Connections								
2010	20,952	2,633	269	2	5,572	509	19	29,956
2011	21,096	2,623	268	2	5,574	474	18	30,055
2012	21,074	2,645	254	2	5,574	447	17	30,013
2013	21,108	2,649	255	2	5,574	427	15	30,030
2014	21,117	2,657	252	2	5,419	427	11	29,885
2015	21,122	2,646	254	1	5,422	402	10	29,857
2016	21,173	2,659	253	1	5,424	444	10	29,964
2017	21,192	2,653	261	1	5,424	436	10	29,977
2018	21,229	2,654	258	1	5,424	425	10	30,001
2019	21,280	2,653	263	1	5,424	417	9	30,047

From the historical customer/connection data the growth rate in customer/connection can be evaluated which is provided on the following table (Table 3-8).

Table 3 - 8: Growth Rate in Customer/Connections

Year	Residential	General Service < 50 kW	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	Unmetered Scattered Load
Growth Rate in Customers/Connections							
2010							
2011	0.7%	(0.4%)	(0.4%)	0.0%	0.0%	(6.9%)	(5.3%)
2012	(0.1%)	0.8%	(5.2%)	0.0%	0.0%	(5.7%)	(5.6%)
2013	0.2%	0.2%	0.4%	0.0%	0.0%	(4.5%)	(11.8%)
2014	0.0%	0.3%	(1.2%)	0.0%	(2.8%)	0.0%	(26.7%)
2015	0.0%	(0.4%)	0.8%	(50.0%)	0.1%	(5.9%)	(9.1%)
2016	0.2%	0.5%	(0.4%)	0.0%	0.0%	10.4%	0.0%
2017	0.1%	(0.2%)	3.2%	0.0%	0.0%	(1.8%)	0.0%
2018	0.2%	0.0%	(1.1%)	0.0%	0.0%	(2.5%)	0.0%
2019	0.2%	(0.0%)	1.9%	0.0%	0.0%	(1.9%)	(10.0%)
Geo Mean - 2017 to 2019	0.17%	(0.1%)	1.3%	0.0%	0.0%	(2.1%)	0.0%

For all classes, except the Street Lighting and Unmetered Load classes, the factor resulting from the geometric mean analysis for 2017 to 2019 is applied to the 2019 customer/connection numbers to determine the forecast of customer/connections in 2020. The geometric mean factor is applied once again to the 2020 value to determine the 2021 forecast. NBHDL has used the factor resulting from the geometric mean analysis for 2017 to 2019 which should be reflective of what is expected to occur in 2020 and 2021. The population of North Bay is relatively stable, therefore the small variations in customer counts in the previous three years should be reflective of the immediate future. For the Street Lighting class, the number of connections for 2020 and 2021 has been set at 5,424 reflecting the current actual count being billed to the City of North Bay. For the Unmetered Scattered Load the number of connections for 2020 and 2021 has been set at 9 representing the actual number of remaining customers in this class, Table 3-9 outlines the forecast of customers by rate class for 2020 and 2021.

Table 3 - 9: Customer/Connection Forecast

Year	Residential	General Service < 50 kW	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	Unmetered Scattered Load	Total
Forecast number of Customers/Connections								
2020	21,316	2,651	266	1	5,424	408	9	30,075
2021	21,352	2,649	269	1	5,424	400	9	30,104

The next step in the process is to review the historical customer/connection usage and to reflect this usage per customer in the forecast. The following table (Table 3-10) provides the average annual usage per customer by rate class from 2010 to 2019.

Table 3 - 10: Historical Annual Usage per Customer

Year	Residential	General Service < 50 kW	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	Unmetered Scattered Load
Annual kWh Usage Per Customer/Connection							
2010	9,858	32,299	855,159	20,514,052	597	1,119	8,691
2011	9,829	32,414	864,430	18,543,426	575	1,016	4,671
2012	9,520	32,117	880,663	17,861,386	501	1,091	5,222
2013	9,845	32,133	849,468	17,887,518	421	1,040	5,939
2014	9,753	32,130	862,048	13,463,278	374	993	4,601
2015	9,314	31,583	851,334	17,738,636	376	930	4,293
2016	8,888	30,328	793,994	16,805,472	377	352	4,293
2017	8,708	29,693	767,610	16,522,752	375	296	4,293
2018	9,270	30,827	775,189	16,185,720	375	293	4,207
2019	9,297	30,309	760,279	15,352,960	375	294	4,388

As can been seen from Table 3-10 above, usage per customer/connection generally declines after 2010. It is NBHDL's view that this decline is partially due to the CDM programs and changing individual usage caused by a variety of factors including weather and the economy. NBHDL's customer base is also very sensitive to weather, especially during the winter months, with a substantial amount of primary or supplemental electric heating in commercial and industrial facilities throughout the City. The reduction in the GS 3,000 to 4,999 kW is reflective of a wind down of one of two customers in the class and ultimately being reduced to one in 2015. The street light Retrofit Program was undertaken from November 2011 through January 2014 and the LED technology has resulted in more energy efficient lighting which has resulted in decreased usage per connection. The reduction in UMSL class is a result of one customer leaving the class that made up a large percentage of the overall.

From the historical usage per customer/connection data the growth rate in usage per customer/connection can be reviewed which is provided on the following table (Table 3-11). The geometric mean growth rate from 2017 to 2019 has also been shown.

Table 3 - 11: Growth Rate in Usage per Customer/Connection

Year	Residential	General Service < 50 kW	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	Unmetered Scattered Load
Growth Rate in Customer/Connection							
2010							
2011	(0.3%)	0.4%	1.1%	(9.6%)	(3.6%)	(9.2%)	(46.3%)
2012	(3.2%)	(0.9%)	1.9%	(3.7%)	(12.9%)	7.4%	11.8%
2013	3.4%	0.0%	(3.5%)	0.1%	(15.8%)	(4.7%)	13.7%
2014	(0.9%)	(0.0%)	1.5%	(24.7%)	(11.2%)	(4.5%)	(22.5%)
2015	(4.5%)	(1.7%)	(1.2%)	31.8%	0.4%	(6.3%)	(6.7%)
2016	(4.6%)	(4.0%)	(6.7%)	(5.3%)	0.3%	(62.2%)	(0.0%)
2017	(2.0%)	(2.1%)	(3.3%)	(1.7%)	(0.3%)	(15.9%)	0.0%
2018	6.4%	3.8%	1.0%	(2.0%)	(0.2%)	(0.9%)	(2.0%)
2019	0.3%	(1.7%)	(1.9%)	(5.1%)	0.2%	0.1%	4.3%
Geo Mean - 2017 to 2019	1.5%	(0.0%)	(1.4%)	(3.0%)	(0.1%)	(5.9%)	0.7%

Except for the Street Lighting, sentinel light, and UMSL classes, the 2020 forecast of usage per customer/connection was determined by applying the historical geometric mean value for 2017 to 2019 to the actual 2019 usage per customer/connection. The historical geometric mean value for 2017 to 2019 is then applied to the 2020 forecast to determine the 2021 forecast in the same manner. For Street lighting, sentinel lights, and UMSL the 2019 actual values were used. These are flat classes and outside of exceptional or unforeseen events, should remain relatively unchanged. The resulting usage forecast is shown in Table 3-12 as follows:

Table 3 - 12: Forecast Annual kWh Usage per Customer/Connection

Year	Residential	General Service < 50 kW	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	Unmetered Scattered Load
Forecast Annual kWh Usage per Customers/Connection							
2020	9,438	30,303	749,362	14,897,244	375	294	4,388
2021	9,580	30,296	738,601	14,455,054	375	294	4,388

The preceding information is used to determine the non-normalized weather billed energy forecast by applying the forecasted numbers of customer/connection from Table 3-9 by the forecast of annual usage per customer/connection from Table 3-12. The resulting non-normalized weather billed energy forecast is shown in the following table (Table 3-13).

Table 3 - 13: Non-normalized Weather Billed Energy Forecast

Year	Residential	General Service < 50 kW	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	Unmetered Scattered Load	TOTAL
NON-normalized Weather Billed Energy Forecast (GWh)								
2020 (Not Normalized)	201.2	80.3	199.3	14.9	2.0	0.1	0.0	497.9
2021 (Not Normalized)	204.6	80.3	198.7	14.5	2.0	0.1	0.0	500.1

The non-normalized weather billed energy forecast has been determined but this 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 494.6 and 493.7 (GWh) for 2020 and 2021 respectively.

The difference between the non-normalized and normalized forecast adjustments is 3.4 GWh in 2020 (i.e., 497.9 – 494.6) and 6.4 GWh in 2021 (i.e., 500.1 – 493.7). 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. Based on the weather normalization work completed by Hydro One for NBHDL for the cost allocation study, which has been used to support this Application, it was determined that the weather sensitivity by rate classes is shown in Table 3-14 below.

Table 3 - 14: Weather Sensitivity by Rate Class

Residential	General Service < 50 kW	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	Unmetered Scattered Load
Weather Sensitivity						
91%	91%	82%	0%	0%	0%	0%

For the General Service 50 to 2,999 kW and the General Service 3,000 to 4,999 kW rate classes the weather sensitivity amount of 82% and 0%, respectively, were provided in the weather normalization work completed by Hydro One. For the Residential and General Service < 50 kW classes, it was assumed in NBHDL 2015 cost of service application that these two classes were 91% weather sensitive. Intervenors accepted this assumption and NBHDL intends to use the same sensitivity percentage here.

The difference between the non-normalized and normalized forecast of 3.3 GWh in 2020 and 6.4 GWh in 2021 has been assigned on a pro rata basis to each rate class based on the above level of weather sensitivity.

2.3.3.4 CDM Adjustment and LRAMVA

A manual adjustment has been made to reflect the impact of 2019 CDM programs on the load forecast. NBHDL has made this adjustment to reflect the 'net' impact of the CDM programs on the load forecast.

Table 3-15, which is consistent with APP.2-I LF_CDM, outlines the actual savings from CDM programs offered between 2015 and 2019 and their persistence into 2021.

Table 3 - 15: CDM Results (2016-2019) and persistence to 2021

Former CFF 6 year (2015-2020) kWh Target: 20,260,000 kWh							
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
2015 CDM Programs	16,748,850	16,682,974	16,674,278	16,670,505	16,663,767	16,660,104	16,656,981
2016 CDM Programs		4,554,824	4,554,804	4,554,783	4,554,761	4,554,740	4,554,740
2017 CDM Programs			6,401,725	5,503,683	5,502,829	5,501,975	5,501,832
2018 CDM Programs				4,027,457	2,917,353	2,907,174	2,907,174
2019 CDM Programs					1,827,951	1,946,094	2,199,926
Total in Year	16,748,850	21,237,798	27,630,807	30,756,427	31,466,661	31,570,087	31,820,653

Since the regression analysis is based on actual power purchased data up to and including 2019 actual data, it is assumed that any savings from programs initiated up to and including 2018 are reflected in the prediction equation resulting from the regression analysis. However, for 2019 it is assumed that for those programs that were initiated in 2019 only one half of the full year results, based on the IESO Participation and Cost report and subsequent project information, actually occur since they were initiated throughout the year. This has been classified as the half year rule for CDM purposes. It also suggests that for 2019 only one half of the reported full year results from programs initiated in 2019 are reflected in the actual 2019 power purchases.

Within this adjustment is an adjustment related to a single project; the Community Energy Park. CDM savings from this account for 777,539 of the total kWh adjustment and 990 of the kW adjustment. Given the unique relationship NBHDL has to the CEP (an affiliated company asset supplying power to City of North Bay accounts), NBHDL is electing to manually adjust for this project based on in depth knowledge of the project itself. To this, NBHDL is proposing a CDM adjustment of 2,322,262 kWh. This is based on 70% of the former usage of the customers at this location without a loss in kW as the facility is expected to continue to peak normally based on periodic shut downs at the generation facility.

As a result, consistent with the approach used in the 2015 COS application and the manual calculation for the CEP, the allocation of the manual adjustment by rate class is shown in Table 3-16 below.

Table 3 - 16: Manual Adjustment

Year	Residential	GS < 50 kW	GS 50 to 2,999 kW	TOTAL
2021 Manual adjustment kWh	19,861	107,439	972,664	1,099,963
Less CEP	-	-	(777,539)	-777,539
Total	19,861	107,439	195,125	322,424
NBHDL CEP Adj	-	-	2,322,262	2,322,262
Total Manual Adjustment	19,861	107,439	2,517,387	2,644,686
2021 Manual adjustment kW	-	-	1,372	1,372
Less CEP	-	-	(990)	-990
Total	-	-	382	382

Given that the CDM savings from 2019 are not expected to change in a material way, we do not expect that there will be a need to make an LRAMVA claim for 2021 or beyond for the Conservation First Framework. Should changes in results be material these values would be compared to actual CDM results in 2019 or subsequent years for programs related to the Conservation First Framework.

NBHDL notes that the Minister has instructed the IESO to offer new CDM programs to customers beginning in January 2021. These will be offered centrally, and NBHDL does not expect to be involved in their delivery. Given that the details of these programs, and their anticipated savings, have not been made available at the time of this application, NBDHL has not adjusted its forecast to capture the impact of these new programs. At this time, the Ontario Energy Board has not provided guidance on whether or how NBHDL should adjust its forecast to account for these programs, or if there will be a new variance account for lost revenue associated with CDM under this new framework. NBHDL takes as a given that any variance account that may be introduced for this new framework will be separate from that LRAMVA for the Conservation First Framework, and that a claim for LRAMVA in 2021 does not preclude eligibility for a future claim for lost revenues associated with the new 2021-2024 Conservation and Demand Management Framework.

The following table (Table 3-17) outlines how the classes have been adjusted to align the non-normalized forecast with the normalized forecast and reflect the adjustments discussed above.

Table 3 - 17: Alignment of Non-normal to Weather Normal Forecast

Year	Residential	General Service < 50 kW	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	Unmetered Scattered Load	TOTAL
Non-normalized Weather Billed Energy Forecast (GWh)								
2020 (Not Normalized)	201.2	80.3	199.3	14.9	2.0	0.1	0.04	497.9
2021 (Not Normalized)	204.6	80.3	198.7	14.5	2.0	0.1	0.04	500.1
Adjustment for Weather (GWh)								
2020	(1.5)	(0.6)	(1.3)	0.0	0.0	0.0	0.00	(3.4)
2021	(2.8)	(1.1)	(2.5)	0.0	0.0	0.0	0.00	(6.4)
Adjustment for CDM (GWh)								
2020	(0.0)	(0.1)	(2.5)	0.0	0.0	0.0	0.00	(2.6)
2021	(0.0)	(0.1)	(2.5)	0.0	0.0	0.0	0.00	(2.6)
Weather Normalized Billed Energy Forecast (GWh)								
2020 Bridge - Normalized	199.7	79.6	195.5	14.9	2.0	0.1	0.0	491.9
2021 Test - Normalized	201.7	79.0	193.7	14.5	2.0	0.1	0.0	491.1

2.3.3.5 Billed kW Load Forecast

There are four rate classes that charge volumetric distribution on per kW basis. These include General Service 50 to 2,999 kW, General Service 3,000 to 4,999 kW, Street Lighting and Sentinel Lighting. As a result, the energy forecast for these classes needs to be converted to a kW basis for rate setting purposes. The forecast of kW for these classes is based on a review of the historical ratio of kW to kWh and applying the average ratio to the forecasted kWh to produce the required kW.

The following table (Table 3-18) outlines the annual demand units by applicable rate class.

Table 3 - 18: Historical Annual kW per Applicable Rate Class

Year	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	TOTAL
Billed Annual kW					
2010	588,203	78,060	9,285	1,541	677,089
2011	582,946	70,473	9,042	1,287	663,748
2012	540,969	68,480	7,788	1,601	618,838
2013	535,313	69,448	6,559	1,224	612,544
2014	533,378	54,355	5,677	1,179	594,589
2015	537,898	39,466	5,690	1,034	584,088
2016	529,360	35,717	5,690	406	571,174
2017	528,741	30,516	5,690	330	565,277
2018	522,247	30,271	5,690	316	558,525
2019	523,294	29,275	5,690	310	558,570

The following table (Table 3-19) outlines the historical ratio of kW/kWh as well as the average ratio for 2017 to 2019 as this reflects the period in which stable local conditions occurred which are expected to continue into 2020 and 2021.

Table 3 - 19: Historical kW/kWh Ratio per Applicable Rate Class

Year	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting
Ratio of kW to kWh				
2010	0.2557%	0.1903%	0.2793%	0.2706%
2011	0.2516%	0.1900%	0.2822%	0.2671%
2012	0.2418%	0.1917%	0.2791%	0.3282%
2013	0.2471%	0.1941%	0.2793%	0.2757%
2014	0.2455%	0.2019%	0.2801%	0.2780%
2015	0.2488%	0.2225%	0.2794%	0.2765%
2016	0.2635%	0.2125%	0.2786%	0.2598%
2017	0.2639%	0.1847%	0.2794%	0.2555%
2018	0.2611%	0.1870%	0.2801%	0.2532%
2019	0.2617%	0.1907%	0.2794%	0.2535%
Average 2017-2019	0.2622%	0.1875%	0.2797%	0.2540%

For the General Service > 50 to 2,999 kW and the Sentinel Lighting classes, the average ratio for 2017 to 2019 was applied to the weather normalized billed energy forecast in Table 3-18 but is adjusted by a reduction of 382 kW as shown in Table 3-16 and an addition of 6,602 kW which represents the model driven effect of manual adjustment for CEP (2,322,262 kWh). For the General Service > 3,000 to 4,999 kW class the average ratio for 2017 to 2019 was applied to the weather normalized billed energy forecast in Table 3-18 to provide the forecast of kW by rate class. For the Street Lighting class, it is assumed the monthly kW for this class is 474 kW reflecting the calculated demand based on the previous load profile. On an annual basis the kW for the Street Lighting class is 474 times 12 or 5,690 kW. The following Table 3-20 outlines the forecast of kW for the applicable rate classes.

Table 3 - 20: kW Forecast by Applicable Rate Class

Year	General Service 50 to 2999 kW	General Service 3000 to 4999 kW	Street Lighting	Sentinel Lighting	TOTAL
Predicted Billed kW					
2020 Bridge - Normalized	518,927	27,927	5,690	304	552,848
2021 Test - Normalized	514,190	27,098	5,690	298	547,277

Table 3-21 provides a summary of the total load forecast on a power purchased and billed level

Table 3 - 21: Summary of Total Load Forecast

	2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge - Normalized	2021 Test - Normalized
Actual kWh Purchases	538,323,196	508,987,624	500,698,339	514,889,565	514,147,824	0	0
Predicted kWh Purchases before CDM adjustment	514,903,442	513,927,827	507,121,219	524,508,323	516,585,739	513,771,071	512,910,056
% Difference between actual and predicted purchases	(4.4%)	1.0%	1.3%	1.9%	0.5%		
Loss Factor						1.0388	1.0388
Total Billed Before Adjustments						494,560,346	493,731,527
CDM Adjustment						2,644,687	2,644,687
Total Billed After Adjustments	516,728,999	488,765,497	482,398,546	496,980,971	495,761,810	491,915,659	491,086,840

Table 3-22 provides a summary of the load forecast on a billing determinant basis by rate class. This table is also consistent with Appendix 2-IB which provides a variance analysis between each year and the last Board approved values. A completed Appendix 2-IB has been filed with this Application.

Table 3 - 22: Summary of Billing Determinants and Variances of Actual and Forecast Data

	2015 Board Approved	2015 Actual	2016 Actual	2017 Actual	2018 Actual	2019 Actual	2020 Bridge - Normalized	2021 Test - Normalized
Residential								
Customers	21,124	21,122	21,173	21,192	21,229	21,280	21,316	21,352
kWh - Actuals	205,497,425	196,730,101	188,194,722	184,546,623	196,784,130	197,847,018	199,682,217	201,705,111
kWh - weather normalized	205,497,425	187,442,874	189,963,368	189,047,599	196,027,587	197,370,718	199,682,217	201,705,111
kWh per customer - Actual	9,728	9,314	8,888	8,708	9,270	9,297	9,368	9,447
kWh per customer - weather norm.	9,728	8,874	8,972	8,921	9,234	9,275	9,368	9,447
Variance Analysis Compare to Board Approved								
Customers		(0.01%)	0.23%	0.32%	0.50%	0.74%	0.91%	1.08%
kWh - Actuals		(4.27%)	(8.42%)	(10.20%)	(4.24%)	(3.72%)	(2.83%)	(1.85%)
kWh - weather normalized		(8.79%)	(7.56%)	(8.00%)	(4.61%)	(3.95%)	(2.83%)	(1.85%)
General Service < 50 kW								
Customers	2,668	2,646	2,659	2,653	2,654	2,653	2,651	2,649
kWh - Actuals	85,361,037	83,568,206	80,643,103	78,774,627	81,814,082	80,410,230	79,636,964	79,035,853
kWh - weather normalized	85,361,037	79,623,121	81,400,983	80,695,891	81,499,545	80,216,649	79,636,964	79,035,853
kWh per customer - Actual	31,994	31,583	30,328	29,693	30,827	30,309	30,040	29,836
kWh per customer - weather norm.	31,994	30,092	30,613	30,417	30,708	30,236	30,040	29,836
Variance Analysis Compare to Board Approved								
Customers		(0.82%)	(0.34%)	(0.56%)	(0.52%)	(0.56%)	(0.64%)	(0.71%)
kWh - Actuals		(2.10%)	(5.53%)	(7.72%)	(4.16%)	(5.80%)	(6.71%)	(7.41%)
kWh - weather normalized		(6.72%)	(4.64%)	(5.47%)	(4.52%)	(6.03%)	(6.71%)	(7.41%)
General Service 50 to 2999 kW								
Customers	247	254	253	261	258	263	266	269
kWh - Actuals	209,884,489	216,238,874	200,880,475	200,346,165	199,998,668	199,953,324	195,503,598	193,697,533
kWh - weather normalized	209,884,489	206,030,678	202,768,342	205,232,482	199,229,767	199,471,953	195,503,598	193,697,533
kW - Actuals	519,865	537,898	529,360	528,741	522,247	523,294	518,927	514,190
kW - Weather Normaiized	519,865	523,492	515,203	521,464	506,212	506,827	518,927	514,190
kW per customer - Actual	2,105	2,118	2,092	2,026	2,024	1,990	1,951	1,911
kW per customer - weather norm.	2,105	2,061	2,036	1,998	1,962	1,927	1,951	1,911
Variance Analysis Compare to Board Approved								
Customers		2.83%	2.43%	5.67%	4.45%	6.48%	7.69%	8.91%
kWh - Actuals		3.03%	(4.29%)	(4.54%)	(4.71%)	(4.73%)	(6.85%)	(7.71%)
kWh - weather normalized		(1.84%)	(3.39%)	(2.22%)	(5.08%)	(4.96%)	(6.85%)	(7.71%)
kW - Actuals		3.47%	1.83%	1.71%	0.46%	0.66%	(0.18%)	(1.09%)
kW - Weather Normaiized		0.70%	(0.90%)	0.31%	(2.63%)	(2.51%)	(0.18%)	(1.09%)
General Service 3000 to 4999 kW								
Customers	1	1	1	1	1	1	1	1
kWh - Actuals	17,254,810	17,738,636	16,805,472	16,522,752	16,185,720	15,352,960	14,897,244	14,455,054
kWh - weather normalized	17,254,810	16,901,231	16,963,409	16,925,731	16,123,493	15,315,999	14,897,244	14,455,054
kW - Actuals	33,801	39,466	35,717	30,516	30,271	29,275	27,927	27,098
kW - Weather Normaiized	33,801	33,217	33,340	33,266	31,689	30,102	27,927	27,098
kW per customer - Actual	33,801	39,466	35,717	30,516	30,271	29,275	27,927	27,098
kW per customer - weather norm.	33,801	33,217	33,340	33,266	31,689	30,102	27,927	27,098
Variance Analysis Compare to Board Approved								
Customers		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
kWh - Actuals		2.80%	(2.60%)	(4.24%)	(6.20%)	(11.02%)	(13.66%)	(16.23%)
kWh - weather normalized		(2.05%)	(1.69%)	(1.91%)	(6.56%)	(11.24%)	(13.66%)	(16.23%)
kW - Actuals		16.76%	5.67%	(9.72%)	(10.44%)	(13.39%)	(17.38%)	(19.83%)
kW - Weather Normaiized		(1.73%)	(1.37%)	(1.59%)	(6.25%)	(10.95%)	(17.38%)	(19.83%)

Street Lighting								
Connections	5,419	5,422	5,424	5,424	5,424	5,424	5,424	5,424
kWh - Actuals	2,018,762	2,036,369	2,042,502	2,036,369	2,031,595	2,036,369	2,036,369	2,036,369
kWh - w eather normalized	2,018,762	1,940,236	2,061,697	2,086,034	2,023,785	2,031,466	2,036,369	2,036,369
kW - Actuals	5,641	5,690	5,690	5,690	5,690	5,690	5,690	5,690
kW - Weather Normaiized	5,641	5,427	5,767	5,835	5,661	5,682	5,690	5,690
kW per customer - Actual	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
kW per customer - w eather norm.	1.0	1.0	1.1	1.1	1.0	1.0	1.0	1.0
Variance Analysis Compare to Board Approved								
Connections		0.06%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
kWh - Actuals		0.87%	1.18%	0.87%	0.64%	0.87%	0.87%	0.87%
kWh - w eather normalized		(3.89%)	2.13%	3.33%	0.25%	0.63%	0.87%	0.87%
kW - Actuals		0.87%	0.87%	0.87%	0.87%	0.87%	0.87%	0.87%
kW - Weather Normaiized		(3.80%)	2.23%	3.43%	0.35%	0.73%	0.87%	0.87%
Sentinel Lighting								
Connections	412	402	444	436	425	417	408	400
kWh - Actuals	405,959	373,880	156,291	129,076	124,703	122,420	119,778	117,430
kWh - w eather normalized	405,959	356,230	157,760	132,224	124,224	122,126	119,778	117,430
kW - Actuals	1,193	1,034	406	330	316	310	304	298
kW - Weather Normaiized	1,193	968	429	359	338	332	304	298
kW per customer - Actual	3	3	1	1	1	1	1	1
kW per customer - w eather norm.	3	2	1	1	1	1	1	1
Variance Analysis Compare to Board Approved								
Connections		(2.43%)	7.77%	5.83%	3.16%	1.21%	(0.97%)	(2.91%)
kWh - Actuals		(7.90%)	(61.50%)	(68.20%)	(69.28%)	(69.84%)	(70.49%)	(71.07%)
kWh - w eather normalized		(12.25%)	(61.14%)	(67.43%)	(69.40%)	(69.92%)	(70.49%)	(71.07%)
kW - Actuals		(13.38%)	(65.97%)	(72.37%)	(73.55%)	(74.00%)	(74.50%)	(75.00%)
kW - Weather Normaiized		(18.86%)	(64.07%)	(69.88%)	(71.71%)	(72.18%)	(74.50%)	(75.00%)
Unmetered Scattered Load								
Customers	7	10	10	10	10	9	9	9
kWh - Actuals	32,045	42,934	42,934	42,934	42,073	39,490	39,490	39,490
kWh - w eather normalized	32,045	40,907	43,337	43,981	41,911	39,395	39,490	39,490
kWh per customer - Actual	4,578	4,293	4,293	4,293	4,207	4,388	4,388	4,388
kWh per customer - w eather norm.	4,578	4,091	4,334	4,398	4,191	4,377	4,388	4,388
Variance Analysis Compare to Board Approved								
Customers		42.86%	42.86%	42.86%	42.86%	28.57%	28.57%	28.57%
kWh - Actuals		33.98%	33.98%	33.98%	31.29%	23.23%	23.23%	23.23%
kWh - w eather normalized		27.65%	35.24%	37.25%	30.79%	22.94%	23.23%	23.23%
Total								
Customer/Connections	29,878	29,857	29,964	29,977	30,001	30,047	30,075	30,104
kWh	520,454,527	516,728,999	488,765,497	482,398,546	496,980,971	495,761,810	491,915,659	491,086,840
kWh- Weather Normailized	520,454,527	492,335,278	493,358,897	494,163,943	495,070,312	494,568,306	491,915,659	491,086,840
kW from applicable classes	560,501	584,088	571,174	565,277	558,525	558,570	552,849	547,277
kW from applicable classes - w n	560,501	563,105	554,738	560,924	543,899	542,943	552,849	547,277
Variance Analysis Compare to Board Approved								
Customer/Connections		(0.07%)	0.29%	0.33%	0.41%	0.57%	0.66%	0.76%
kWh		(0.72%)	(6.09%)	(7.31%)	(4.51%)	(4.74%)	(5.48%)	(5.64%)
kWh- Weather Normailized		(5.40%)	(5.21%)	(5.05%)	(4.88%)	(4.97%)	(5.48%)	(5.64%)
kW from applicable classes		4.21%	1.90%	0.85%	(0.35%)	(0.34%)	(1.37%)	(2.36%)
kW from applicable classes - w n		0.46%	(1.03%)	0.08%	(2.96%)	(3.13%)	(1.37%)	(2.36%)

2.3.4 ACCURACY OF LOAD FORECAST AND VARIANCE ANALYSIS

2.3.4.1 Variance Analysis of Distribution Revenue and Billing Determinants

The following discussion provides a year over year variance analysis on NBHDL's distribution revenue and billing determinants. The variance analysis will compare 2015 Actual to 2015 Board Approved; 2016 Actual to 2015 Actual; 2017 Actual to 2016 Actual; 2018 Actual to 2017 Actual; 2019 Actual to 2018 Actual; 2020 Bridge to 2019 Actual and 2021 test to 2020 Bridge (see Tables 3-23 to 3-43). 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 3-22. The overall variance analysis has been provided based on NBHDL's materiality of $75,000; the materiality calculation being noted earlier in Exhibit 1 of NBHDL's COS rate application. NBHDL has chosen to use $75,000 as its basis for variance analysis of distribution revenues.

2.3.4.2 2015 Actual vs 2015 Board Approved

Table 3 - 23: Distribution Revenue - 2015 Actual vs 2015 Board Approved

Distribution Revenues	2015 Board Approved	2015 Actual	2015 Actual vs. 2015 Board Approved
Residential	6,869,445	6,746,588	(122,857)
General Service < 50 kW	2,274,362	2,273,518	(844)
General Service 50 to 2999 kW	2,061,696	1,985,500	(76,196)
General Service 3000 to 4999 kW	93,913	89,460	(4,453)
Street Lighting	449,705	454,386	4,681
Sentinel Lighting	43,209	38,317	(4,892)
Unmetered Scattered Load	814	1,275	461
Distribution Revenue	**11,793,143**	**11,589,043**	**(204,100)**

There are three significant drivers of the variance between 2015 Board Approved distribution revenue and 2015 Actual; volumetric and customer/connection count variances, the assumption of a full year of revenue at the Board Approved rates set in the 2015 COS, and the final year of collection on the SMDR/SMIRR rate riders.

For the Residential class, revenue was down ($122,857) compared to Board Approved as a result of kWh consumption being down 4% and six months of revenue at 2014 rates, offset by the SMDR/SMIRR rate rider.

The GS > 50 kW class variance was primarily a result of six months of revenue at 2014 rates.

The variances in the other classes are immaterial.

Table 3 - 24: Billing Determinants - 2015 Actual vs 2015 Board Approved

	Customer/Connections			kWh		kW		
Billing Determinants	2015 Board Approved	2015 Actual	Difference	2015 Board Approved	2015 Actual	2015 Board Approved	2015 Actual	Volumeteric Difference
Residential	21,124	21,122	(2)	205,497,425	196,730,101			(8,767,324)
General Service < 50 kW	2,668	2,646	(22)	85,361,037	83,568,206			(1,792,831)
General Service 50 to 2999 kW	247	254	7			519,865	537,898	18,033
General Service 3000 to 4999 kW	1	1	0			33,801	39,466	5,665
Street Lighting	5,419	5,422	3			5,641	5,690	49
Sentinel Lighting	412	402	(10)			1,193	1,034	(160)
Unmetered Scattered Load	7	10	3	32,045	42,934			10,889
Total	29,878	29,857	(21)	290,890,507	280,341,240	560,501	584,088	

Customer count totals for 2015 were relatively close to the Board Approved counts. NBHDL had a slight decrease in Residential, GS<50, and Sentinel Lighting, while GS>50, Street Lights and UMSL saw a slight increase.

System kWh did not achieve the Board Approved figures for Residential and GS<50. kW was higher for demand customers with the exception of Sentinel Lights.

Table 3 - 25: Average Consumption – 2015 Actual vs 2015 Board Approved

Average Consumption or Demand per Customer/Connection	kWh/kW	2015 Board Approved	2015 Weather Actual		2015 Weather Normalized	
			Average	Variance	Average	Variance
Residential	kWh	9,728	9,314	-4.3%	8,874	-8.8%
General Service < 50 kW	kWh	31,994	31,583	-1.3%	30,092	-5.9%
General Service 50 to 2999 kW	kW	2,105	2,118	0.6%	2,061	-2.1%
General Service 3000 to 4999 kW	kW	33,801	39,466	16.8%	33,217	-1.7%
Street Lighting	kW	1.0	1.0	0.8%	1.0	-3.8%
Sentinel Lighting	kW	2.9	2.6	-11.2%	2.4	-16.8%
Unmetered Scattered Load	kWh	4,578	4,293	-6.2%	4,091	-10.6%

Actual variances for 2015 as compared to the 2015 Board Approved are in line with the billing determinants with the exceptions of the UMSL class where the customer count increased by 3 total or 43%. Since this class has so few customers an increase in count may result in a decrease in average usage, which can be seen here with the average usage for UMSL customers decreasing 6.2%.

Weather normalized 2015 customer averages as compared to 2015 Board Approved are lower across all customer classes.

NBHDL experiences very little growth in customer counts year over year. As such, the average usage per customer will be a reflection of weather, economic indicators, and the result of local CDM efforts. For the GS

3000-4999 kW class, this is a single customer and usage is explained by individual patterns and not overall trends.

2.3.4.3 2016 Actual vs 2015 Actual

Table 3 - 26: Distribution Revenue - 2016 Actual vs 2015 Actual

Distribution Revenues	2015 Actual	2016 Actual	2016 Actual vs. 2015 Actual
Residential	6,746,588	6,786,338	39,750
General Service < 50 kW	2,273,518	2,190,672	(82,846)
General Service 50 to 2999 kW	1,985,500	2,034,152	48,652
General Service 3000 to 4999 kW	89,460	89,683	224
Street Lighting	454,386	456,778	2,392
Sentinel Lighting	38,317	32,489	(5,828)
Unmetered Scattered Load	1,275	1,140	(135)
Distribution Revenue	**11,589,043**	**11,591,252**	**2,209**

The GS <50kW class distribution revenue was lower in 2016 by $82,846 due to a number of factors. Standard variable and fixed revenue were higher by $34,249 and $35,796 respectively. This was offset by higher variable disposition related to the IFRS transition ($16,662), higher foregone revenue recovery ($9,424), lower LRAM recognition ($6,109), and lower smart meter recovery ($139,543).

The other classes changed by immaterial amounts.

Table 3 - 27: Billing Determinants - 2016 Actual vs 2015 Actual

	Customer/Connections			kWh		kW		
Billing Determinants	2015 Actual	2016 Actual	Difference	2015 Actual	2016 Actual	2015 Actual	2016 Actual	Volumeteric Difference
Residential	21,122	21,173	51	196,730,101	188,194,722			(8,535,379)
General Service < 50 kW	2,646	2,659	13	83,568,206	80,643,103			(2,925,103)
General Service 50 to 2999 kW	254	253	(1)			537,898	529,360	(8,537)
General Service 3000 to 4999 kW	1	1	0			39,466	35,717	(3,749)
Street Lighting	5,422	5,424	2			5,690	5,690	0
Sentinel Lighting	402	444	42			1,034	406	(628)
Unmetered Scattered Load	10	10	0	42,934	42,934			(0)
Total	29,857	29,964	107	280,341,240	268,880,758	584,088	571,174	

Customer count totals for 2016 were higher in all but GS>50, which doesn't experience much fluctuation in North Bay. Other changes are consistent NBHDL's relatively flat total customer count trends.

KWh totals were lower across all metered customer classes. Sentinel lights experienced the largest % change due to the beginning of an LED retrofit on a significant portion of this class.

Table 3 - 28: Average Consumption – 2016 Actual vs 2015 Actual

Average Consumption or Demand per Customer/Connection	kWh/kW	Weather Actual			Weather Normalized		
		2015	2016	Variance	2015	2016	Variance
Residential	kWh	9,314	8,888	-4.6%	8,874	8,972	1.1%
General Service < 50 kW	kWh	31,583	30,328	-4.0%	30,092	30,613	1.7%
General Service 50 to 2999 kW	kW	2,118	2,092	-1.2%	2,061	2,036	-1.2%
General Service 3000 to 4999 kW	kW	39,466	35,717	-9.5%	33,217	33,340	0.4%
Street Lighting	kW	1.0	1.0	0.0%	1.0	1.1	6.2%
Sentinel Lighting	kW	2.6	0.9	-64.4%	2.4	1.0	-59.9%
Unmetered Scattered Load	kWh	4,293	4,293	0.0%	4,091	4,334	5.9%

Actual variances for 2016 actuals as compared to the 2015 actuals are in line with the billing determinants.

Weather normalized 2016 customer averages as compared to 2015 are negligible in Residential, GS <50, GS 50-2,999 and GS 3,000 – 4,999. Street Lighting and UMSL both saw slight increases in normalized customer usage while Sentinel Lights saw a drastic decrease in customer usage. This is due to the same LED retrofit described above.

NBHDL experiences very little growth in customer counts year over year. As such, the average usage per customer will be a reflection of weather, economic indicators, and the result of local CDM efforts. For the GS 3,000-4,999 kW class, this is a single customer and usage can be explained by individual patterns and not overall trends.

2.3.4.4 2017 Actual vs 2016 Actual

Table 3 - 29: Distribution Revenue - 2017 Actual vs 2016 Actual

Distribution Revenues	2016 Actual	2017 Actual	2017 Actual vs. 2016 Actual
Residential	6,786,338	6,978,369	192,032
General Service < 50 kW	2,190,672	2,218,037	27,365
General Service 50 to 2999 kW	2,034,152	2,165,452	131,300
General Service 3000 to 4999 kW	89,683	92,189	2,506
Street Lighting	456,778	463,668	6,890
Sentinel Lighting	32,489	31,132	(1,357)
Unmetered Scattered Load	1,140	1,152	12
Distribution Revenue	**11,591,252**	**11,950,000**	**358,748**

Residential distribution revenue increased by $192,032. May 1 saw another stage in the transition to fully fixed residential rates resulting in a fixed increase of $828,923 and a decrease in variable revenue of $636,891. These transitions allow for lesser sensitivity to lower consumption within the rate class as the process moves forward. Other disposition and recovery items also contributed to the increase.

The GS>50 class increased by $41,685 and $89,616 in fixed and variable revenue respectively. Largely due a small increase in customer count and the annual incremental increase. Other disposition and recovery items also contributed to the increase.

The change in year over year distribution revenue in each of the other classes is immaterial.

Table 3 - 30: Billing Determinants - 2017 Actual vs 2016 Actual

	Customer/Connections			kWh		kW		
Billing Determinants	2016 Actual	2017 Actual	Difference	2016 Actual	2017 Actual	2016 Actual	2017 Actual	Volumeteric Difference
Residential	21,173	21,192	19	188,194,722	184,546,623			(3,648,098)
General Service < 50 kW	2,659	2,653	(6)	80,643,103	78,774,627			(1,868,475)
General Service 50 to 2999 kW	253	261	8			529,360	528,741	(619)
General Service 3000 to 4999 kW	1	1	0			35,717	30,516	(5,201)
Street Lighting	5,424	5,424	0			5,690	5,690	0
Sentinel Lighting	444	436	(8)			406	330	(76)
Unmetered Scattered Load	10	10	0	42,934	42,934			0
Total	29,964	29,977	13	268,880,758	263,364,184	571,174	565,277	

Customer counts in 2017 experienced very little change over 2016, with the largest increase in the Residential class.

NBHDL's sole General Service 3,000-4,999 customer reduced their demand by 15% over 2016. While significant, a single customer's demand can allow for greater variability year over year when doing an analysis by class.

Table 3 - 31: Average Consumption – 2017 Actual vs 2016 Actual

Average Consumption or Demand per Customer/Connection	kWh/kW	Weather Actual			Weather Normalized		
		2016	2017	Variance	2016	2017	Variance
Residential	kWh	8,888	8,708	-2.0%	8,972	8,921	-0.6%
General Service < 50 kW	kWh	30,328	29,693	-2.1%	30,613	30,417	-0.6%
General Service 50 to 2999 kW	kW	2,092	2,026	-3.2%	2,036	1,998	-1.9%
General Service 3000 to 4999 kW	kW	35,717	30,516	-14.6%	33,340	33,266	-0.2%
Street Lighting	kW	1.0	1.0	0.0%	1.1	1.1	1.2%
Sentinel Lighting	kW	0.9	0.8	-17.3%	1.0	0.8	-14.6%
Unmetered Scattered Load	kWh	4,293	4,293	0.0%	4,334	4,398	1.5%

Actual variances for 2017 actuals as compared to the 2016 actuals are in line with the billing determinants.

Weather normalized 2017 customer averages as compared to 2016 are negligible in all but the Sentinel Light class. This is due to the continuation of the LED retrofit that began in 2016 and is reflected in weather normalized usage per connection.

NBHDL experiences very little growth in customer counts year over year. As such, the average usage per customer will be a reflection of weather, economic indicators, and the result of local CDM efforts. For the GS 3,000-4,999 kW class, this is a single customer and usage can be explained by individual patterns and not overall trends.

2.3.4.5 2018 Actual vs 2017 Actual

Table 3 - 32: Distribution Revenue - 2018 Actual vs 2017 Actual

Distribution Revenues	2017 Actual	2018 Actual	2018 Actual vs. 2017 Actual
Residential	6,978,369	7,247,834	269,464
General Service < 50 kW	2,218,037	2,313,988	95,951
General Service 50 to 2999 kW	2,165,452	2,172,131	6,678
General Service 3000 to 4999 kW	92,189	96,389	4,200
Street Lighting	463,668	468,216	4,548
Sentinel Lighting	31,132	30,533	(599)
Unmetered Scattered Load	1,152	1,146	(6)
Distribution Revenue	**11,950,000**	**12,330,237**	**380,237**

Residential distribution revenue increased by $269,464 due to increased rates and an increase in consumption in the overall class. A further stage in the transition to fixed rate meant the increase in kWh of 7% has a lower effect in the variable revenue than previous years.

General service less than 50kW increased by $95,951 of the previous year. This is due to increased rates and a 4% increase in consumption over the previous year.

All other distribution revenue changes are immaterial by individual class.

Table 3 - 33: Billing Determinants - 2018 Actual vs 2017 Actual

	Customer/Connections			kWh		kW		
Billing Determinants	2017 Actual	2018 Actual	Difference	2017 Actual	2018 Actual	2017 Actual	2018 Actual	Volumeteric Difference
Residential	21,192	21,229	37	184,546,623	196,784,130			12,237,507
General Service < 50 kW	2,653	2,654	1	78,774,627	81,814,082			3,039,455
General Service 50 to 2999 kW	261	258	(3)			528,741	522,247	(6,494)
General Service 3000 to 4999 kW	1	1	0			30,516	30,271	(245)
Street Lighting	5,424	5,424	0			5,690	5,690	0
Sentinel Lighting	436	425	(11)			330	316	(14)
Unmetered Scattered Load	10	10	0	42,934	42,073			(861)
Total	29,977	30,001	24	263,364,184	278,640,285	565,277	558,525	

Customer counts in 2018 again experienced very little change over 2017, with the largest increase in the Residential class.

KWh increased over 2017 due to weather. Driving this was 2018 experiencing 200 more heating degrees days than the previously year and 119 more cooling degree days. kW was down slightly over the previous year for demand driven customer classes.

Table 3 - 34: Average Consumption – 2018 Actual vs 2017 Actual

Average Consumption or Demand per Customer/Connection	kWh/kW	Weather Actual			Weather Normalized		
		2017	2018	Variance	2017	2018	Variance
Residential	kWh	8,708	9,270	6.4%	8,921	9,234	3.5%
General Service < 50 kW	kWh	29,693	30,827	3.8%	30,417	30,708	1.0%
General Service 50 to 2999 kW	kW	2,026	2,024	-0.1%	1,998	1,962	-1.8%
General Service 3000 to 4999 kW	kW	30,516	30,271	-0.8%	33,266	31,689	-4.7%
Street Lighting	kW	1.0	1.0	0.0%	1.1	1.0	-3.0%
Sentinel Lighting	kW	0.8	0.7	-1.8%	0.8	0.8	-3.6%
Unmetered Scattered Load	kWh	4,293	4,207	-2.0%	4,398	4,191	-4.7%

Actual variances for 2018 actuals as compared to the 2017 actuals are in line with the billing determinants.

Weather normalized 2018 customer averages as compared to 2017 are slightly higher for Residential and GS<50, while GS 50-2,999, GS 3,000-4,999, Street Lighting, Sentinel Lighting, and UMSL all had slightly lower normalized average use per customer.

NBHDL experiences very little growth in customer counts year over year. As such, the average usage per customer will be a reflection of weather, economic indicators, and the result of local CDM efforts. For the GS 3,000-4,999 kW class, this is a single customer and usage can be explained by individual patterns and not overall trends.

2.3.4.6 2019 Actual vs 2018 Actual

Table 3 - 35: Distribution Revenue - 2019 Actual vs 2018 Actual

Distribution Revenues	2018 Actual	2019 Actual	2019 Actual vs. 2018 Actual
Residential	7,247,834	7,232,640	(15,194)
General Service < 50 kW	2,313,988	2,259,697	(54,291)
General Service 50 to 2999 kW	2,172,131	2,200,759	28,629
General Service 3000 to 4999 kW	96,389	95,341	(1,048)
Street Lighting	468,216	467,009	(1,207)
Sentinel Lighting	30,533	29,926	(607)
Unmetered Scattered Load	1,146	1,126	(20)
Distribution Revenue	**12,330,237**	**12,286,498**	**(43,739)**

There were no material variances between 2019 and 2018.

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

	Customer/Connections			kWh		kW		
Billing Determinants	2018 Actual	2019 Actual	Difference	2018 Actual	2019 Actual	2018 Actual	2019 Actual	Volumeteric Difference
Residential	21,229	21,280	51	196,784,130	197,847,018			1,062,888
General Service < 50 kW	2,654	2,653	(1)	81,814,082	80,410,230			(1,403,852)
General Service 50 to 2999 kW	258	263	5			522,247	523,294	1,047
General Service 3000 to 4999 kW	1	1	0			30,271	29,275	(996)
Street Lighting	5,424	5,424	0			5,690	5,690	0
Sentinel Lighting	425	417	(8)			316	310	(5)
Unmetered Scattered Load	10	9	(1)	42,073	39,490			(2,583)
Total	30,001	30,047	46	278,640,285	278,296,738	558,525	558,570	

Both customer counts and consumption were relatively stable as compared to 2018.

Table 3 - 37: Average Consumption – 2019 Actual vs 2018 Actual

Average Consumption or Demand per Customer/Connection	kWh/kW	Weather Actual			Weather Normalized		
		2018	2019	Variance	2018	2019	Variance
Residential	kWh	9,270	9,297	0.3%	9,234	9,275	0.4%
General Service < 50 kW	kWh	30,827	30,309	-1.7%	30,708	30,236	-1.5%
General Service 50 to 2999 kW	kW	2,024	1,990	-1.7%	1,962	1,927	-1.8%
General Service 3000 to 4999 kW	kW	30,271	29,275	-3.3%	31,689	30,102	-5.0%
Street Lighting	kW	1.0	1.0	0.0%	1.0	1.0	0.4%
Sentinel Lighting	kW	0.7	0.7	0.2%	0.8	0.8	0.2%
Unmetered Scattered Load	kWh	4,207	4,388	4.3%	4,191	4,377	4.4%

Actual variances for 2019 actuals as compared to the 2018 actuals are in line with the billing determinants. GS 50-2,999 and UMSL classes are the only ones showing an inverse relationship to class change in consumption and average consumption. Changes in counts in classes with fewer customers can have large impacts on the average consumption of the class itself.

Weather normalized 2019 customer averages as compared to 2018 were negligible in all classes except GS 3,000-4,999 and UMSL, both classes with few customers.

NBHDL experiences very little growth in customer counts year over year. As such, the average usage per customer will be a reflection of weather, economic indicators, and the result of local CDM efforts. For the GS 3,000-4,999 kW class, this is a single customer and usage can be explained by individual patterns and not overall trends.

2.3.4.7 2020 Bridge vs 2019 Actual

Table 3 - 38: Distribution Revenue - 2020 Bridge vs 2019 Actual

Distribution Revenues	2019 Actual	2020 Bridge	2020 Bridge Year vs. 2019 Actual
Residential	7,232,640	7,265,493	32,853
General Service < 50 kW	2,259,697	2,220,329	(39,368)
General Service 50 to 2999 kW	2,200,759	2,214,842	14,082
General Service 3000 to 4999 kW	95,341	99,100	3,759
Street Lighting	467,009	474,864	7,855
Sentinel Lighting	29,926	28,084	(1,842)
Unmetered Scattered Load	1,126	1,116	(10)
Distribution Revenue	**12,286,498**	**12,303,828**	**17,330**

There are no material variances between 2020 and 2019.

Table 3 - 39: Billing Determinants - 2020 Bridge vs 2019 Actual

	Customer/Connections			kWh		kW		
Billing Determinants	2019 Actual	2020 Bridge	Difference	2019 Actual	2020 Bridge	2019 Actual	2020 Bridge	Volumeteric Difference
Residential	21,280	21,316	36	197,847,018	199,682,217			1,835,199
General Service < 50 kW	2,653	2,651	(2)	80,410,230	79,636,964			(773,266)
General Service 50 to 2999 kW	263	266	3			523,294	518,927	(4,368)
General Service 3000 to 4999 kW	1	1	0			29,275	27,927	(1,348)
Street Lighting	5,424	5,424	0			5,690	5,690	0
Sentinel Lighting	417	408	(9)			310	304	(6)
Unmetered Scattered Load	9	9	0	39,490	39,490			0
Total	30,047	30,075	28	278,296,738	279,358,670	558,570	552,849	

Customer counts are based on trending methodology as described above for the Load Forecast Model.

The 2020 Bridge Year consumption is weather normalized; the results are from NBHDL's Load Forecast Model used in this Application and explained at the beginning of this Exhibit.

Table 3 - 40: Average Consumption – 2020 Bridge vs 2019 Actual

Average Consumption or Demand per Customer/Connection	kWh/kW	Weather Actual			Weather Normalized		
		2019	2020 (WN)	Variance	2019	2020	Variance
Residential	kWh	9,297	9,368	0.8%	9,275	9,368	1.0%
General Service < 50 kW	kWh	30,309	30,040	-0.9%	30,236	30,040	-0.6%
General Service 50 to 2999 kW	kW	1,990	1,951	-2.0%	1,927	1,951	1.2%
General Service 3000 to 4999 kW	kW	29,275	27,927	-4.6%	30,102	27,927	-7.2%
Street Lighting	kW	1.0	1.0	0.0%	1.0	1.0	0.1%
Sentinel Lighting	kW	0.7	0.7	0.2%	0.8	0.7	-6.3%
Unmetered Scattered Load	kWh	4,388	4,388	0.0%	4,377	4,388	0.2%

Actual variances for the 2020 Bridge Year as compared to the 2019 actuals are in line with the billing determinants. Only the GS 50-2,999 and GS 3,000-4,999 classes show a noticeable reduction and this is consistent with the trend over the historical period.

Weather normalized 2019 customer averages as compared to 2018 were negligible in all classes except GS 3,000-4,999 and Sentinel Lights; this is consistent with the historical trending.

NBHDL experiences very little growth in customer counts year over year. As such, the average usage per customer will be a reflection of weather, economic indicators, and the result of local CDM efforts. For the GS 3,000-4,999 kW class, this is a single customer and usage can be explained by individual patterns and not overall trends.

2.3.4.8 2021 Test vs 2020 Bridge

Table 3 - 41: Distribution Revenue - 2021 Test vs 2020 Bridge

Distribution Revenues	2020 Bridge	2021 Test Year at Existing Rates	2021 Test Year (ER) vs 2020 Bridge Year	2021 Test - Proposed Rates	2021 Test Year (PR) vs 2020 Bridge Year
Residential	7,265,493	7,479,179	213,686	8,839,633	1,574,140
General Service < 50 kW	2,220,329	2,312,188	91,860	2,634,802	414,473
General Service 50 to 2999 kW	2,214,842	2,282,752	67,910	2,683,554	468,713
General Service 3000 to 4999 kW	99,100	98,093	(1,007)	111,780	12,680
Street Lighting	474,864	483,854	8,990	147,909	(326,955)
Sentinel Lighting	28,084	29,781	1,696	38,348	10,263
Unmetered Scattered Load	1,116	1,099	(17)	1,095	(21)
Distribution Revenue	**12,303,828**	**12,686,946**	**383,118**	**14,457,121**	**2,153,293**

The proposed 2021 Test Year distribution revenue is a reflection of the 2021 COS application and the proposed base revenue requirement of NBHDL. The variance in distribution revenue over the 2020 Bridge Year is a result of the proposed increases to fixed and variable distribution revenue in the 2021 Test Year.

Table 3 - 42: Billing Determinants - 2021 Test vs 2020 Bridge

	Customer/Connections			kWh		kW		
Billing Determinants	2020 Bridge	2021 Test	Difference	2020 Bridge	2021 Test	2020 Bridge	2021 Test	Volumeteric Difference
Residential	21,316	21,352	36	199,682,217	201,705,111			2,022,894
General Service < 50 kW	2,651	2,649	(2)	79,636,964	79,035,853			(601,111)
General Service 50 to 2999 kW	266	269	3			518,927	514,190	(4,736)
General Service 3000 to 4999 kW	1	1	0			27,927	27,098	(829)
Street Lighting	5,424	5,424	0			5,690	5,690	0
Sentinel Lighting	408	400	(8)			304	298	(6)
Unmetered Scattered Load	9	9	0	39,490	39,490			0
Total	30,075	30,104	29	279,358,670	280,780,454	552,849	547,277	

Year over year changes are a result of the inputs of the load forecast model which is explained in detail above. Flat growth rates, minimal increases to kWh, and reduced kW are appropriate on a go forward basis for rate setting purposes

Table 3 - 43: Average Consumption – 2021 Test vs 2020 Bridge

Average Consumption or Demand per Customer/Connection	kWh/kW	Weather Normalized		
		2020	2021	Variance
Residential	kWh	9,368	9,447	0.8%
General Service < 50 kW	kWh	30,040	29,836	-0.7%
General Service 50 to 2999 kW	kW	1,951	1,911	-2.0%
General Service 3000 to 4999 kW	kW	27,927	27,098	-3.0%
Street Lighting	kW	1.0	1.0	0.0%
Sentinel Lighting	kW	0.7	0.7	0.0%
Unmetered Scattered Load	kWh	4,388	4,388	0.0%

When determining the billed energy forecast as described in 2.3.3.3, NBHDL applied a 3-year geometric mean year over year in 2020 and 2021 to determine the non-normalized average consumption by class with the same average 10-year average heating and cooling degree days. Therefore, the change in average usage in 2020 compared to 2021 is due to trending and weather normalization. This results in a slight increase in average Residential consumption and a slight decrease in GS<50, GS 50-2,999, and GS 3,000-4,999. Street Lighting, Sentinel Lighting, and UMSL remain constant.

2.3.5 OTHER REVENUE

2.3.5.1 Variance Analysis of Other Revenue:

Table 3-44 below provides details on the other revenue included in NBHDL's operating revenue which is consistent with the other revenue data provided in Table 3-1. RSVA carrying charges associated with deferral

and variance accounts recorded in account 4405 have been excluded in the values shown in the table below. Each variance that is above the materiality threshold is included in Tables 3-45 through 3-51 below with explanations.

With respect to accounts 4375 & 4380, these accounts tend to increase and decrease together year over year due to the nature of their relationship. As such, only those years where the net year over year variance of the two is material will be addressed. These accounts primarily include revenue and expenses related to non-rate regulated CDM activities and the reduction in values from 2019 forward reflect the winding down of CDM activities. NBHDL also records affiliate administrative revenue in Account 4375 which can be reconciled to Appendix 2-N – Shared Services and Corporate Cost Allocation. Variances outside of these items are noted within the applicable explanations.

NBHDL confirms that there are no discrete customer groups that will be materially impacted by changes to other rates and charges.

Table 3 - 44: Other Revenue with Variances

USoA	Other Revenue	2015 Board Approved	2015 Actual	2015 Actual vs. 2015 Board Approved	2016 Actual	2016 Actual vs. 2015 Actual	2017 Actual	2017 Actual vs. 2016 Actual	2018 Actual	2018 Actual vs. 2017 Actual	2019 Actual	2019 Actual vs. 2018 Actual	2020 Bridge	2020 Bridge Year vs. 2019 Actual	2021 Test	2021 Test Year vs. 2020 Bridge Year
4086	SSS Administration Charge Revenue	83,834	84,282	448	85,403	1,121	86,269	866	86,924	655	87,410	486	87,188	(222)	86,997	(191)
4082	Retail Services Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	24,145	24,145
4084	Service Transaction Requests Revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	428	428
4210	Rent from Electric Property	198,208	315,551	117,343	260,464	(55,087)	260,448	(16)	245,584	(14,863)	266,288	20,704	261,898	(4,390)	499,198	237,299
4220	Other Electric Revenues	-	177	177	-	(177)	-	-	-	-	-	-	-	-	-	-
4225	Late Payment Charges	138,983	144,454	5,471	145,466	1,012	161,685	16,219	152,362	(9,323)	134,994	(17,368)	77,754	(57,240)	150,473	72,719
4235	Specific Service Charges	591,356	616,193	24,837	579,684	(36,509)	437,297	(142,387)	358,852	(78,445)	214,871	(143,980)	144,519	(70,352)	144,519	-
4245	Government Assistance		43,035	43,035	48,689	5,654	71,269	22,580	80,619	9,350	93,371	12,752	104,244	10,873	116,593	12,349
4325	Merchandising, Jobbing	4,900		(4,900)	-	-	-	-	-	-	-	-	-	-	-	-
4335	Profits and losses from financial instruments	-	(152,493)	(152,493)	672,578	825,071	890,292	217,714	(140,775)	(1,031,067)	(681,401)	(540,626)	-	681,401	-	-
4355	Gain on disposal of property	-	19,959	19,959	137,183	117,224	30,000	(107,183)	3,432	(26,568)	90,253	86,821	-	(90,253)	-	-
4375	Revenues from Non-Utility Operations	2,556,998	1,386,728	(1,170,270)	1,103,430	(283,299)	1,237,152	133,722	1,155,268	(81,884)	864,459	(290,809)	666,439	(198,020)	67,344	(599,095)
4380	Expenses of Non-Utility Operations	(2,505,068)	(1,322,810)	1,182,258	(1,091,120)	231,690	(1,316,877)	(225,757)	(1,320,284)	(3,407)	(876,802)	443,482	(606,983)	269,819	(17,123)	589,860
4385	Non-Utility Rental Income	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4390	Miscellaneous Non-Operating Income	11,925	22,104	10,179	3,199	(18,906)	14,685	11,487	9,197	(5,489)	3,042	(6,154)	9,120	6,078	9,120	-
4398	Foreign Exchange Gains and Losses	-	18,074	18,074	(13,352)	(31,426)	(10,733)	2,619	915	11,648	(1,406)	(2,321)	(15,000)	(13,594)	(15,000)	-
4405	Interest & Dividend Income	92,798	104,588	11,790	107,758	3,169	141,039	33,281	230,285	89,246	862,621	632,336	246,566	(616,055)	161,771	(84,795)
	Other Income and Expenses	161,553	119,186	(42,367)	968,364	849,178	1,056,828	88,464	18,657	(1,038,171)	354,138	335,480	404,386	50,248	322,705	(81,681)
	Other Revenue	1,173,934	1,279,843	105,909	2,039,381	759,538	2,002,526	(36,855)	862,379	(1,140,147)	1,057,701	195,321	975,746	(81,955)	1,228,465	228,147

Table 3 - 45: 2015 Actual vs 2015 Board Approved

USoA	Other Revenue	2015 Board Approved	2015 Actual	2015 Actual vs. 2015 Board Approved
4210	Rent from Electric Property	198,208	315,551	117,343
4335	Profits and losses from financial instruments	-	(152,493)	(152,493)

Rent from electric property was $117,343 higher in 2015 than Board Approved 2015 due to higher Joint Use pole rental fees collected in 2015. A new material increase in pole connection counts resulting from a major fibre wire project was completed by a third party resulting in higher revenues.

Profits or losses from financial instruments can vary significantly year-to-year and are outside of NBHDL's control. The market value of the loan instrument fluctuates up or down with the market, and NBHDL assesses the value at December 31 each year, at which point non-cash gains or losses are recorded for fiscal financial reporting as required under IFRS. These variances continue year over year and this explanation is consistent through all years.

Table 3 - 46: 2016 Actual vs 2015 Actual

USoA	Other Revenue	2015 Actual	2016 Actual	2016 Actual vs. 2015 Actual
4335	Profits and losses from financial instruments	(152,493)	672,578	825,071
4355	Gain on disposal of property	19,959	137,183	117,224

NBHDL experienced a non-cash gain on financial instruments in 2016 of $672,578.

The gain on disposal of property was $177,224 higher in 2016. This is mainly due to insurance proceeds recovered in relation to a transformer failure at MS15.

Table 3 - 47: 2017 Actual vs 2016 Actual

USoA	Other Revenue	2016 Actual	2017 Actual	2017 Actual vs. 2016 Actual
4235	Specific Service Charges	579,684	437,297	(142,387)
4335	Profits and losses from financial instruments	672,578	890,292	217,714
4355	Gain on disposal of property	137,183	30,000	(107,183)
4375	Revenues from Non-Utility Operations	1,103,430	1,237,152	133,722
4380	Expenses of Non-Utility Operations	(1,091,120)	(1,316,877)	(225,757)

Specific Service Charges decreased by $142,387 between the 2017 and 2016. This is almost entirely due to the elimination of the $30 collection charge ($141,390), driven by the winter disconnection ban that came in to effect February 24, 2017. NBHDL would note that the 2015 board-approved revenue offset for collection charges was in excess of $400,000; the 2021 test year is $0 in accordance with OEB directives.

NBHDL experienced a non-cash gain on financial instruments in 2017 of $890,292.

Gain on disposal of property in 2017 was $107,1836 lower than the 2016 Actual. In 2017, NBHDL had only a line truck disposal, compared to 2016 where insurance and other proceeds make up the relatively greater figure.

Activity from non-utility operations decreased on a net basis in 2017 by $92,035. In 2017, the executive management team began work on the acquisition of Espanola Regional Hydro Distribution Corp ("ERHDC"). Costs incurred and allocated to Account 4380 account for $117,556 and are the driving factor in the year over year net decrease.

Table 3 - 48: 2018 Actual vs 2017 Actual

USoA	Other Revenue	2017 Actual	2018 Actual	2018 Actual vs. 2017 Actual
4235	Specific Service Charges	437,297	358,852	(78,445)
4335	Profits and losses from financial instruments	890,292	(140,775)	(1,031,067)
4375	Revenues from Non-Utility Operations	1,237,152	1,155,268	(81,884)
4380	Expenses of Non-Utility Operations	(1,316,877)	(1,320,284)	(3,407)
4405	Interest & Dividend Income	141,039	230,285	89,246

The decrease of $78,445 in Account 4255 Specific Service Charges is again related to the Winter Disconnection Moratorium. A full year of this effect is accounted for in 2018 as opposed to only a partial impact in 2017. The variance specifically related to collection charges was $65,640.

NBHDL experienced a non-cash loss on financial instruments in 2018 of $140,775.

Net Revenues and Expenses from Non-Utility operations again decreased in 2018 primarily related to costs associated with the acquisition of ERHDC as costs increased $83,218 over the previous year, accounting for most of the decrease.

Interest and Dividend Income rose by $89,246 in 2018 versus 2017. This is accounted for by both an increase in the interest paid on bank balances ($34,709) and interest earned from an intercompany loan to an affiliate ($54,537).

Table 3 - 49: 2019 Actual vs 2018 Actual

USoA	Other Revenue	2018 Actual	2019 Actual	2019 Actual vs. 2018 Actual
4235	Specific Service Charges	358,852	214,871	(143,980)
4335	Profits and losses from financial instruments	(140,775)	(681,401)	(540,626)
4355	Gain on disposal of property	3,432	90,253	86,821
4375	Revenues from Non-Utility Operations	1,155,268	864,459	(290,809)
4380	Expenses of Non-Utility Operations	(1,320,284)	(876,802)	443,482
4405	Interest & Dividend Income	230,285	862,621	632,336

Specific Service Charges continued its trend of year over year decreases. As part of the OEB's review of customer service rules, on July 1, 2019, the "collection of account charge" was deemed to be part of a utilities normal business activities, and as such was eliminated. This resulted in only a partial year of revenue collection on this charge and it is responsible for $122,824 of the decrease.

NBHDL experienced a non-cash loss on financial instruments in 2019 of $681,401.

Like previous years, the net increase in Non-Utility operations is being driven by reduction in the spending related to the acquisition of ERHDC. As the process came to a close, relatively fewer dollars were spent in 2019 (reduction of $144,145).

Account 4405, Interest and Dividend income increased significantly in 2019, partially as a result of a one-time true-up. In 2014 NBHDL entered into a joint venture collaboration with several other LDCs to form CustomerFirst (now known as Ecobility), a company geared towards the successful planning, execution, and delivery of CDM programs under the Conservation First framework. In 2019, after a detailed review of IFRS guidelines and materiality, NBHDL was required to classify this as an equity investment on its balance sheet. The adjustment represented a valuation on NBHDL's financial statements that covered equity generated over a 6-year timeframe resulting in a significant adjustment to align the value over this timeframe. As these business activities are related directly to CDM, the investment income should have been mapped to the Account 4375 as non-rate regulated income. NBHDL will submit a revision request to the OEB to address this error.

Table 3 - 50: 2020 Bridge vs 2019 Actual

USoA	Other Revenue	2019 Actual	2020 Bridge	2020 Bridge Year vs. 2019 Actual
4335	Profits and losses from financial instruments	(681,401)	-	681,401
4405	Interest & Dividend Income	862,621	246,566	(616,055)

Profit and losses from Financial Instrument Hedges are not predicted for the 2020 Bridge Year as the year-end value is volatile and difficult to predict.

The 2020 Bridge year decrease of $616,055 versus 2019 actuals is attributed to the explanation above with respect to Ecobility; $85,000 in relation to this investment is expected in 2020, a significant reduction to the prior year adjustment. As referenced above, the mapping of actual revenues incurred will be to 4375 as these are related to non-rate regulated activities.

Table 3 - 51: 2021 Test vs 2020 Bridge

USoA	Other Revenue	2020 Bridge	2021 Test	2021 Test Year vs. 2020 Bridge Year
4210	Rent from Electric Property	261,898	499,198	237,299
4405	Interest & Dividend Income	246,566	161,771	(84,795)

Account 4210 Rent from Electric Property is expected to increase by $237,299 as result of an increase in Joint Use Pole Rental Revenue. In June 2018, the OEB issued accounting guidance on their "*Report on Wireline Pole Attachment Charges (EB-2015-0304)*" dated March 22, 2018. As a result, previous increases in rental charges were allocated to Account 1508. NBDHL will record the full revenue related to these charges in 2021 forward and is recognizing this increase as a revenue offset in the Test Year. The proposed disposition of Account 1508 can be found in Exhibit 9.

NBHDL is not forecasting investment income in 2021 and submits that this is not relevant as this is a non-rate regulated activity. As a result, Account 4405 will decrease by $84,795 in 2021 Test versus 2020 Bridge year.

2.3.5.2 Proposed New Service Charges

NBHDL is not proposing any new Specific Service Charges.

2.3.5.3 Revenue from Affiliate Transactions, Shared Service and Corporate Cost Allocation

NBHDL provides a summary of revenue from affiliate transactions, shared services, and corporate cost allocations in Section 2.4.3.3.4 of Exhibit 4. For each affiliate transaction, NBHDL has identified the service, the nature of the service provided to affiliated entities, the accounts used to record the revenue, and the associated costs to provide the service. This schedule is filed in Tab 20 “App.2-N_Corp_Cost_Allocation” of the Chapter 2 Appendices.

Accounts related to affiliate revenue and affiliate expense are in the footnote of Appendix 2-H of Chapter 2 Appendices - Main (i.e., itemized in the details of Account 4375 and Account 4380).

APPENDIX 3-A: MONTHLY DATA USED FOR REGRESSION ANALYSIS

	Purchased	Heating Degree Days	Cooling Degree Days	Number of Days in Month	Spring Fall Flag	Predicted Purchases
Jan-15	60,955,014	1065	0	31	0	56,985,475
Feb-15	56,605,601	1041	0	28	0	53,881,444
Mar-15	52,369,681	801	0	31	1	49,122,029
Apr-15	42,936,932	439	0	30	1	40,310,182
May-15	38,321,444	191	8	31	1	36,625,332
Jun-15	37,322,701	101	2	30	0	35,182,763
Jul-15	41,173,436	37	55	31	0	40,437,780
Aug-15	40,113,558	30	45	31	0	39,205,743
Sep-15	39,126,212	72	43	30	1	36,997,623
Oct-15	40,715,709	380	0	31	1	39,890,112
Nov-15	42,394,599	436	0	30	1	40,243,276
Dec-15	46,288,309	565	0	31	0	46,021,683
Jan-16	53,275,790	882	0	31	0	52,974,412
Feb-16	50,185,520	857	0	29	0	50,699,587
Mar-16	45,995,357	681	0	31	1	46,490,763
Apr-16	41,316,027	545	0	30	1	42,648,597
May-16	36,199,389	207	12	31	1	37,359,911
Jun-16	36,570,355	90	22	30	0	37,102,807
Jul-16	40,114,787	29	58	31	0	40,556,012
Aug-16	41,396,575	13	69	31	0	41,493,957
Sep-16	36,257,722	102	12	30	1	34,206,547
Oct-16	38,047,288	311	2	31	1	38,554,052
Nov-16	40,688,065	472	0	30	1	41,029,694
Dec-16	48,940,750	783	0	31	0	50,811,487
Jan-17	50,172,295	800	0	31	0	51,169,050
Feb-17	44,767,408	730	0	28	0	47,054,849
Mar-17	48,902,657	798	0	31	1	49,052,930
Apr-17	38,767,221	397	0	30	1	39,397,629
May-17	36,984,603	256	1	31	1	37,231,369
Jun-17	35,651,142	86	14	30	0	36,155,791
Jul-17	38,088,069	30	31	31	0	37,620,900
Aug-17	36,767,307	65	13	31	0	36,466,274
Sep-17	36,665,580	121	30	30	1	36,661,919
Oct-17	37,361,044	252	0	31	1	37,082,258
Nov-17	43,727,237	621	0	30	1	44,301,502
Dec-17	52,843,775	971	0	31	0	54,926,748
Jan-18	55,165,428	922	0	31	0	53,843,092
Feb-18	46,543,673	756	0	28	0	47,631,775
Mar-18	46,187,501	717	0	31	1	47,269,504
Apr-18	42,016,294	584	0	30	1	43,493,147
May-18	36,563,258	196	15	31	1	37,532,911
Jun-18	35,697,073	78	17	30	0	36,326,637
Jul-18	42,293,825	8	95	31	0	44,190,067
Aug-18	40,093,009	16	55	31	0	40,040,684
Sep-18	35,816,190	150	24	30	1	36,639,367
Oct-18	39,622,118	432	0	31	1	41,022,028
Nov-18	44,982,862	672	0	30	1	45,416,966
Dec-18	49,908,333	797	0	31	0	51,102,144
Jan-19	56,704,516	1042	0	31	0	56,490,810
Feb-19	49,050,451	811	0	28	0	48,844,856
Mar-19	48,618,580	770	0	31	1	48,443,099
Apr-19	40,799,606	484	0	30	1	41,290,737
May-19	36,697,206	288	0	31	1	37,871,967
Jun-19	35,140,288	92	7	30	0	35,557,466
Jul-19	42,388,534	7	74	31	0	41,848,965
Aug-19	37,599,279	43	18	31	0	36,571,127
Sep-19	33,915,685	155	2	30	1	34,290,692
Oct-19	37,837,876	348	0	31	1	39,184,858
Nov-19	45,382,225	678	0	30	1	45,555,165
Dec-19	50,013,578	775	0	31	0	50,635,996

	Purchased	Heating Degree Days	Cooling Degree Days	Number of Days in Month	Spring Fall Flag	Predicted Purchases
Jan-20		935	0	31	0	54,149,214
Feb-20		815	0	29	0	49,781,770
Mar-20		709	0	31	1	47,098,285
Apr-20		461	0	30	1	40,802,104
May-20		200	10	31	1	36,988,362
Jun-20		79	18	30	0	36,457,411
Jul-20		22	64	31	0	41,087,589
Aug-20		35	40	31	0	38,787,475
Sep-20		140	16	30	1	35,496,720
Oct-20		338	0	31	1	39,003,200
Nov-20		569	0	30	1	43,159,605
Dec-20		790	0	31	0	50,959,338
Jan-21		935	0	31	0	54,149,214
Feb-21		815	0	28	0	48,920,756
Mar-21		709	0	31	1	47,098,285
Apr-21		461	0	30	1	40,802,104
May-21		200	10	31	1	36,988,362
Jun-21		79	18	30	0	36,457,411
Jul-21		22	64	31	0	41,087,589
Aug-21		35	40	31	0	38,787,475
Sep-21		140	16	30	1	35,496,720
Oct-21		338	0	31	1	39,003,200
Nov-21		569	0	30	1	43,159,605
Dec-21		790	0	31	0	50,959,338