Island Regulatory and Appeals Commission
134 Kent St.
National Bank Tower
Charlottetown, PE, C1A 1N2

December 18, 2019

Dear Sirs,

Re: Island Regulatory and Appeals Commission
**   Weather Normalization Reserve and Adjustments**

As requested by the Island Regulatory and Appeals Commission ("IRAC" or the "Commission") we have completed our review of Maritime Electric Company Limited's ("the Company's" or "MECL") Weather Normalization Reserve and Adjustments ("WNR").

The procedures undertaken in the course of our financial analysis do not constitute an audit of the Company's financial information and consequently, we do not express an opinion on the financial information.

Background

This letter outlines the procedures undertaken and findings of Grant Thornton's review, and conclusions to assist the Commission in approving the updated 2019 WNR components. There are two attachments at the end of this letter. Attachment A is the original WNR calculations and adjustments (known as Appendix 5) provided by MECL to Grant Thornton. Attachment B is the reconciled WNR calculations and adjustments (known as Appendix 5) provided by MECL in response to the errors identified by Grant Thornton as outlined in this letter and for which they seek approval.

The Weather Normalization Reserve and Adjustments was introduced in the General Rate Application filed October 28th, 2015. The purpose of the WNR, as outlined in that application, was "to stabilize electricity rates to customers by removing the volatility in sales and energy supply costs caused by temperature changes relative to historical averages."

The approved definition, outlined in the General Rate Application filed October 28th, 2015, is stated as follows:
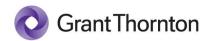
> **Contributions to Weather Normalization Reserve = MWh Variation From Average X Marginal Net Revenue**
>
> > Where,
> >
> > - **MWh Variation from Average** = (Actual HDD Value – Average HDD Value) X (MWh per HDD Coefficient)
> >
> > And where,
> >
> > - **Marginal Net Revenue** = Forecast Unit Revenue per MWh – Forecast Unit Energy Cost per MWh

The WNR calculation uses both historical and forecasted data and requires IRAC approval each year to ensure transparency and that the updated components of the WNR definition are agreed upon by the Commission. MECL is also required to calculate monthly adjustments to the WNR and provide those adjustments to the Commission.

The Commission approved the WNR on an interim basis until February 28, 2019. The Commission subsequently extended the interim period of the WNR until February 28th, 2022 as outlined in UE19-08, Order number 17 under the Weather Normalization Mechanism subcategory, page 53.

Procedures

Our procedures with respect to verifying the updated components of the Weather Normalization Reserve and the annual adjustments were directed towards the verification of the data incorporated in the calculations and the methodology used by the Company. Specifically, the procedures which we performed included the following:

- Reviewed WNR schedules and components within the General Rate Application filed October 28th, 2015, the Revisions to the components of the Weather Normalization Mechanism and Reserve filed on October 31st, 2016, the Revisions to the components of the Weather Normalization Mechanism and Reserve filed on October 31st, 2017, Appendix 5 of the General Rate Application filed November 30th, 2018 ("2018 GRA") which contained the WNR, Exhibit M-25 GRA Revised Rates and Schedules filed July 31, 2019, and a revised Appendix 5 with WNR schedules updated for actuals to October 31, 2019 provided by MECL in an email dated November 27, 2019 (Attachment A);
- Checked the clerical accuracy of the components in the WNR schedules;
- Reviewed the methodology used in the components of the WNR definition to ensure it is in accordance with Commission's orders and established policy and procedures;
- Reviewed the data within each WNR component to ensure it was cross-referenced between 2015-2019 Weather Normalization schedules to ensure consistency and accuracy;
- Reviewed data relating to Heating Degree Days (HDD) to the Environment Canada website provided in MECL's excel document;
- Reviewed the components within the calculation of the MWh per HDD Coefficient for accuracy;
- Checked that the linear regression formula used to calculate 2019 Coefficient was consistent with the previous approved Coefficient calculations; and
- Compared actuals contained in Attachment A to MECL's Monthly Report to IRAC as at October 31, 2019 to ensure accuracy in data reporting.
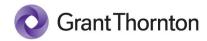
Findings and Comments

As a result of the above outlined procedures completed, we have the following comments:

Calculation of 10 Year Average HDD (Appendix 5, Schedule 1)

Certain of the data provided by Environment Canada is not complete, meaning not all historical HDD data could be verified by Grant Thornton. For items available, we compared the components of the calculation of the 10 year average HDD to actuals provided by Environment Canada and we found the following errors:

- December 2013 HDD value as per MECL is 750 but Environment Canada states 744;
- February 2016 HDD value as per MECL is 608 but Environment Canada states 626; and

- October 2018 HDD value as per MECL was recorded as both 338.2 and 341 in separate schedules. Environment Canada states 338.7 for October 2018.

The impact of these errors was reconciled and schedules recalculated by MECL to reflect the most accurate data. The Company's revised "Appendix 5 – WNR Calculations and Adjustments" filing can be found in Attachment B of this letter.

MECL noted that Environment Canada commonly has HDD data missing or estimated. MECL uses the best dataset available at the time of calculation but may not revise the updated HDD data published by Environment Canada in its subsequent WNR calculations. According to MECL, the Company may compensate missing data from the Charlottetown Weather Station and retrieve it from the Harrington Station located near Brackley, PEI.

We recalculated MECL revisions as a result of the errors note above and confirmed they have been incorporated within Attachment B of this letter.

MWh per HDD Coefficient (Appendix 5, Schedule 2)

We recalculated the components of the MWh per HDD Coefficient (the "Coefficient") calculation including days in month, average HDD per day, average MWh per day and HDD per day. We also verified the actual HDD against Environment Canada where possible, and agreed the 'fewer hours of daylight' to source documentation. For reported sales (MWh) included in the calculation we ensured it agreed to monthly sales provided by MECL as indicated in Attachment B of this letter. We did not note any exceptions.

We also recalculated the 2019 Coefficient of 50.19 MWh and ensured that the linear regression formula used to calculate 2019 Coefficient was consistent with the previous approved Coefficient calculations.

Based on our procedures on the MWh per HDD Coefficient, we did not note any exceptions.

Calculation of Forecast Marginal Net Revenue Rate (Appendix 5, Schedule 3)

Forecast Unit Revenue per MWh

This component of the calculation normally includes forecast data for the coming year. Due to the delayed approval of the WNR variables for 2019, actuals were included within this calculation up until October 31, 2019. We compared the actuals included in the Forecast Unit Revenue calculation to MECL's Monthly Report to IRAC as at October 31, 2019 and requested a reconciliation from MECL for differences noted. MECL stated that the actual sales revenue for Residential, General Service, and Small Industrial provided to the Commission in their monthly updates include service charges and, with the exception of Small Industrial, seasonal sales revenue. Both service charges and seasonal revenue are not included in WNR calculations, as noted in the General Rate Application filed October 31, 2015. Further, when MECL was conducting their review and reconciliation to IRAC monthly reporting, the Company noted that there were errors with their actual sales revenue reported. MECL incorrectly included the ECAM collected within their sales revenue calculations for the WNR and did not include monthly billing adjustments to sales revenue calculations for the WNR. MECL's revised actual monthly sales revenue calculations were verified by Grant Thornton and have been incorporated within Attachment B of this letter.

As part of our review of the revenue forecast, we noted the $/kWh for the small industrial customer for forecast November and December was approximately $0.126/kWh and $0.129/kWh, respectively, which was much lower in comparison to actual average of approximately $0.141/kWh for previous 10 months. MECL response to Grant Thornton on this discrepancy was as follows:

> *"In the latter part of 2017, early 2018 we had a number of small industrial customers move from the small industrial rate to large industrial rate and our forecast for small industrial revenue for subsequent years was adjusted to reflect this change. For small industrial demand, the 2019 forecast was approximately 295MW. Actual demand year to date is approximately 268MW which effectively reduced the demand forecast for each of November and December to approximately 13.5 MW versus a YTD average of 29 MW. Therefore we are revising the forecast demand for the year to 323MW for small industrials. This increases the revenue forecast for small industrials from our previous submission by the following amounts:*
>
> *November 2019 = (28100 KW – 13619 KW) X $7.46 = $108,028*
>
> *December 2019 = (27031 KW – 13101 KW) X $7.46 = $103,918*
>
> *This will bring the $/kWh for small industrial more in line with the average experienced in the previous 10 months."*

MECL's revised forecast monthly sales revenue for November and December for Small Island Industrial were verified as being incorporated within Attachment B of this letter.

Based on actual sales to October 31, 2019 and forecast sales for November and December 2019 in Attachment B, we recalculated the forecast unit revenue per MWh of $143.70 and did not note any exceptions.

Forecast Unit Energy Cost per MWh

The Energy Cost Adjustment Mechanism ("ECAM") base rate used to calculate marginal net revenue is $91.61 per MWh, which complies with the Commission's UE19-08 Order #1 under the subcategory of "Rates", page 52.

We recalculated the revised Marginal Net Revenue Rate of $52.09 per MWh included in Attachment B and did not note any exceptions.

Monthly Change in Weather Normalization Reserve (Appendix 5, Schedule 4)

As a result of the errors noted above in this letter, the cumulative and certain monthly adjustments of the WNR since February 2016 were impacted. MECL recalculated the monthly adjustments found in Attachment B.

Table 1 below compares the annual cumulative year end balances as per the originally reported WNR monthly adjustments to the revised WNR monthly adjustments as a result of the errors noted in this letter:

Table 1: Year End Weather Normalization Reserve Balance, as at December 31st

Year End Cumulative Balance of WNR – Balance Owning (Recoverable)			
	Original Appendix 5, Schedule 4 (Attachment A)	Revised Appendix 5, Schedule 4 (:Attachment B)	Difference
2016	$(71,327)	$(25,459)	$45,868
2017	$(178,187)	$(131,034)	$47,153
2018	$290,983	$335,978	$44,995
2019*	$837,659*	$854,977*	$17,318

*As at October 31, 2019

Revised WNR 2019 components

Table 2 below outlines the updated components of the 2019 WNR as submitted to Grant Thornton by MECL on December 14, 2019 via email to correct the errors identified above as detailed in Attachment B:

Table 2: Updated 2019 Weather Normalization Reserve components proposed by MECL

Weather Normalization Reserve Variables Provided by MECL	
Average HDD Value	4,365
MWh per HDD Coefficient	50.19
Forecast Unit Revenue per MWh	143.70
Forecast Unit Energy Cost per MWh	91.61

Conclusion

Based on the results of the above procedures and after MECL corrected the errors identified above, we did not note any further discrepancies and therefore conclude that the information provided in Table 2 above and Attachment B is in accordance with the approved definition of the Weather Normalization Reserve.

In order to minimize discrepancies on the accuracy of the WNR reporting, we recommend IRAC establish a policy with regard to missing HDD data published by Environment Canada. This policy would provide clarity over the WNR calculation when MECL uses estimated HDD data, as well as any updating to WNR adjustments between the time of reporting and when actual HDD is available in subsequent WNR adjustment filings.

I trust this is the information you requested. If you have any questions, please contact us.

Yours sincerely,

Grant Thornton LLP

Chris Brake, CPA, CA

Partner

Barry Griffiths, CPA, CA

Senior Manager

Grant Thornton

Attachment A – Original WNR

											10 year average
											Appendix 5
											Schedule 1
											Calculation of 10-Year Average HDD

Month	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	10 year average (2008 - 2017)
Jan	728	866	686	744	715	812	771	829	713	712	758
Feb	686	664	608	697	700	672	717	858	608	657	687
Mar	694	675	556	621	572	603	760	743	654	690	657
Apr	418	420	367	420	379	441	453	537	475	416	433
May	286	245	262	259	224	235	308	233	259	264	258
Jun	95	102	114	150	119	107	120	163	121	94	119
Jul	0	42	13	21	12	13	1	28	30	27	19
Aug	20	30	21	14	5	17	28	3	23	29	19
Sep	121	135	107	90	76	106	118	73	101	92	102
Oct	300	345	290	249	240	291	228	315	255	203	272
Nov	421	392	429	397	424	472	461	420	401	440	426
Dec	620	643	515	569	589	750	582	545	665	695	617
	4,389	4,559	3,968	4,231	4,055	4,519	4,547	4,747	4,305	4,319	**4,364**
								Standard Deviation			240

Appendix 5
Schedule 2
Calculation of MWh/HDD Coefficient

Year	Month	Days in month	Actual HDD	HDD per day	Reported sales (MWh)	Fewer hours of daylight	Average HDD per day	Average MWh per day
2017	Jul	31	27	0.9	76,298			
	Aug	31	29	0.9	78,217			
	Sep	30	92	3.1	80,074			
	Oct	31	203	6.5	75,216	2.52	4.8	2,507
	Nov	30	440	14.7	82,686	4.07	10.6	2,667
	Dec	31	695	22.4	96,151	5.21	18.5	3,205
2018	Jan	31	764	24.7	111,163	5.40	23.5	3,586
	Feb	28	621	22.2	106,524	4.53	23.4	3,436
	Mar	31	602	19.4	89,909	3.11	20.8	3,211
	Apr	30	445	14.8	92,948	1.53	17.1	2,998
	May	31	280	9.0	78,410	0.00	11.9	2,614
	Jun	30	168	5.6	77,199			

Linear regression results:

(Oct 2017 - May 2018)

HDD	Daylight hrs	b	
50.19	51.18	2039.06	coefficients
5.35	18.99	82.54	standard error coefficients
0.97	81.40	#N/A	R^2, standard error y
81.77	5.00	#N/A	F, degrees of freedom
1083543	33128.63	#N/A	Regression SS, residual SS
9.38	2.70	24.70	t values

Appendix 5
Schedule 3
Calculation of Forecast Marginal Net Revenue Rate for 2019

Appendix 5
Schedule 1

Rate Class	2019 (Forecast)		
	Revenue ($)	Sales (MWh)	Unit Revenue ($/MWh)
Residential	86,264,450	617,950	*
General Service	61,074,065	387,506	*
Small Industrial	12,753,746	91,596	
Total	160,092,260	1,097,052	$ 145.93
ECAM Base Rate			$ (91.61)
Marginal Net Revenue Rate			$ 54.32

* Excludes revenue and kWh sales from seasonal customers

<table>
<thead>
<tr><th rowspan="4">MM/YY</th><th colspan="3">Heating Degree Days
(below 18 deg C)</th><th colspan="2">Space heating load</th><th rowspan="2">Marginal
Net Revenue</th><th colspan="2">Weather Normalization Reserve</th></tr>
<tr><th rowspan="2">Actual
HDD</th><th>10 Year
Average</th><th>Variation
from 10 Year</th><th rowspan="2">Coefficient</th><th>Variation
from Average</th><th>Increase
(Decrease)</th><th>Balance Owing
(Recoverable)</th></tr>
<tr><th>Monthly HDD</th><th>Average HDD</th><th>(MWh)</th><th>($/MWh)</th><th>($)</th><th>($)</th></tr>
<tr><th></th><th></th><th></th><th>(MWh/HDD)</th><th></th><th></th><th></th><th></th></tr>
</thead>
<tbody>
<tr><td>January, 2016</td><td>713</td><td>753.9</td><td>(40.9)</td><td>41.73</td><td>(1,707)</td><td>50.42</td><td>(86,055)</td><td>(86,055)</td></tr>
<tr><td>February, 2016</td><td>608</td><td>688.2</td><td>(80.2)</td><td>41.73</td><td>(3,347)</td><td>50.42</td><td>(168,743)</td><td>(254,798)</td></tr>
<tr><td>March, 2016</td><td>654</td><td>637.2</td><td>16.8</td><td>41.73</td><td>701</td><td>50.42</td><td>35,348</td><td>(219,450)</td></tr>
<tr><td>April,2016</td><td>475</td><td>420.6</td><td>54.4</td><td>41.73</td><td>2,270</td><td>50.42</td><td>114,459</td><td>(104,991)</td></tr>
<tr><td>May, 2016</td><td>259</td><td>264.5</td><td>(5.5)</td><td>41.73</td><td>(230)</td><td>50.42</td><td>(11,572)</td><td>(116,563)</td></tr>
<tr><td>June, 2016</td><td>121</td><td>110.0</td><td>11.0</td><td>41.73</td><td>459</td><td>50.42</td><td>23,144</td><td>(93,419)</td></tr>
<tr><td>July, 2016</td><td>30</td><td>16.5</td><td>13.5</td><td>41.73</td><td>563</td><td>50.42</td><td>28,404</td><td>(65,014)</td></tr>
<tr><td>August, 2016</td><td>23</td><td>24.2</td><td>(1.2)</td><td>41.73</td><td>(50)</td><td>50.42</td><td>(2,525)</td><td>(67,539)</td></tr>
<tr><td>September, 2016</td><td>101</td><td>107.1</td><td>(6.1)</td><td>41.73</td><td>(255)</td><td>50.42</td><td>(12,835)</td><td>(80,374)</td></tr>
<tr><td>October, 2016</td><td>255</td><td>272.8</td><td>(17.8)</td><td>41.73</td><td>(743)</td><td>50.42</td><td>(37,452)</td><td>(117,825)</td></tr>
<tr><td>November, 2016</td><td>401</td><td>421.8</td><td>(20.8)</td><td>41.73</td><td>(868)</td><td>50.42</td><td>(43,764)</td><td>(161,589)</td></tr>
<tr><td>December, 2016</td><td>665</td><td>622.1</td><td>42.9</td><td>41.73</td><td>1,790</td><td>50.42</td><td>90,263</td><td>(71,327)</td></tr>
<tr><td>January, 2017</td><td>712</td><td>751.4</td><td>(39.4)</td><td>43.21</td><td>(1,702)</td><td>49.56</td><td>(84,375)</td><td>(155,701)</td></tr>
<tr><td>February, 2017</td><td>657</td><td>704.2</td><td>(47.2)</td><td>43.21</td><td>(2,040)</td><td>49.56</td><td>(101,078)</td><td>(256,779)</td></tr>
<tr><td>March, 2017</td><td>690</td><td>646.1</td><td>43.9</td><td>43.21</td><td>1,897</td><td>49.56</td><td>94,011</td><td>(162,768)</td></tr>
<tr><td>April,2017</td><td>416</td><td>433.7</td><td>(17.7)</td><td>43.21</td><td>(765)</td><td>49.56</td><td>(37,904)</td><td>(200,672)</td></tr>
<tr><td>May, 2017</td><td>264</td><td>256.4</td><td>7.6</td><td>43.21</td><td>328</td><td>49.56</td><td>16,275</td><td>(184,397)</td></tr>
<tr><td>June, 2017</td><td>94</td><td>114.6</td><td>(20.6)</td><td>43.21</td><td>(890)</td><td>49.56</td><td>(44,115)</td><td>(228,512)</td></tr>
<tr><td>July, 2017</td><td>27</td><td>16.4</td><td>10.6</td><td>43.21</td><td>458</td><td>49.56</td><td>22,700</td><td>(205,812)</td></tr>
<tr><td>August, 2017</td><td>29</td><td>22.8</td><td>6.2</td><td>43.21</td><td>268</td><td>49.56</td><td>13,277</td><td>(192,535)</td></tr>
<tr><td>September, 2017</td><td>92</td><td>106.2</td><td>(14.2)</td><td>43.21</td><td>(614)</td><td>49.56</td><td>(30,409)</td><td>(222,944)</td></tr>
<tr><td>October, 2017</td><td>203</td><td>279.6</td><td>(76.8)</td><td>43.21</td><td>(3,319)</td><td>49.56</td><td>(164,466)</td><td>(387,410)</td></tr>
<tr><td>November, 2017</td><td>440</td><td>423.6</td><td>16.1</td><td>43.21</td><td>696</td><td>49.56</td><td>34,478</td><td>(352,932)</td></tr>
<tr><td>December, 2017</td><td>695</td><td>613.8</td><td>81.6</td><td>43.21</td><td>3,526</td><td>49.56</td><td>174,745</td><td>(178,187)</td></tr>
<tr><td>January, 2018</td><td>764</td><td>760.1</td><td>4.3</td><td>46.66</td><td>201</td><td>51.38</td><td>10,309</td><td>(167,878)</td></tr>
<tr><td>February, 2018</td><td>621</td><td>697.3</td><td>(76.5)</td><td>46.66</td><td>(3,569)</td><td>51.38</td><td>(183,400)</td><td>(351,278)</td></tr>
<tr><td>March, 2018</td><td>602</td><td>652.1</td><td>(50.1)</td><td>46.66</td><td>(2,338)</td><td>51.38</td><td>(120,109)</td><td>(471,388)</td></tr>
<tr><td>April,2018</td><td>445</td><td>440.1</td><td>5.0</td><td>46.66</td><td>233</td><td>51.38</td><td>11,987</td><td>(459,401)</td></tr>
<tr><td>May, 2018</td><td>280</td><td>261.9</td><td>18.0</td><td>46.66</td><td>840</td><td>51.38</td><td>43,153</td><td>(416,248)</td></tr>
<tr><td>June, 2018</td><td>168</td><td>121.2</td><td>47.2</td><td>46.66</td><td>2,202</td><td>51.38</td><td>113,157</td><td>(303,091)</td></tr>
<tr><td>July, 2018</td><td>14</td><td>18.9</td><td>(4.9)</td><td>46.66</td><td>(229)</td><td>51.38</td><td>(11,747)</td><td>(314,838)</td></tr>
<tr><td>August, 2018</td><td>9</td><td>19.9</td><td>(10.5)</td><td>46.66</td><td>(490)</td><td>51.38</td><td>(25,173)</td><td>(340,011)</td></tr>
<tr><td>September, 2018</td><td>125</td><td>104.7</td><td>20.0</td><td>46.66</td><td>933</td><td>51.38</td><td>47,948</td><td>(292,063)</td></tr>
<tr><td>October, 2018</td><td>338</td><td>276.1</td><td>62.1</td><td>46.66</td><td>2,898</td><td>51.38</td><td>148,878</td><td>(143,185)</td></tr>
<tr><td>November, 2018</td><td>520</td><td>426.3</td><td>93.2</td><td>46.66</td><td>4,349</td><td>51.38</td><td>223,437</td><td>80,252</td></tr>
<tr><td>December, 2018</td><td>709</td><td>621.1</td><td>87.9</td><td>46.66</td><td>4,101</td><td>51.38</td><td>210,731</td><td>290,983</td></tr>
<tr><td>January, 2019</td><td>757</td><td>757.6</td><td>(1.1)</td><td>50.19</td><td>(55)</td><td>54.32</td><td>(2,999)</td><td>287,984</td></tr>
<tr><td>February, 2019</td><td>737</td><td>686.7</td><td>50.1</td><td>50.19</td><td>2,515</td><td>54.32</td><td>136,587</td><td>424,571</td></tr>
<tr><td>March, 2019</td><td>638</td><td>656.8</td><td>(19.3)</td><td>50.19</td><td>(969)</td><td>54.32</td><td>(52,617)</td><td>371,954</td></tr>
<tr><td>April,2019</td><td>449</td><td>432.6</td><td>16.2</td><td>50.19</td><td>813</td><td>54.32</td><td>44,166</td><td>416,120</td></tr>
<tr><td>May, 2019</td><td>352</td><td>257.5</td><td>94.1</td><td>50.19</td><td>4,723</td><td>54.32</td><td>256,544</td><td>672,664</td></tr>
<tr><td>June, 2019</td><td>106</td><td>118.5</td><td>(12.6)</td><td>50.19</td><td>(632)</td><td>54.32</td><td>(34,351)</td><td>638,313</td></tr>
<tr><td>July, 2019</td><td>26</td><td>18.7</td><td>6.8</td><td>50.19</td><td>341</td><td>54.32</td><td>18,539</td><td>656,851</td></tr>
<tr><td>August, 2019</td><td>17</td><td>19.0</td><td>(1.7)</td><td>50.19</td><td>(85)</td><td>54.32</td><td>(4,635)</td><td>652,217</td></tr>
<tr><td>September, 2019</td><td>143</td><td>101.9</td><td>40.7</td><td>50.19</td><td>2,043</td><td>54.32</td><td>110,960</td><td>763,177</td></tr>
<tr><td>October, 2019</td><td>299</td><td>271.6</td><td>27.3</td><td>50.19</td><td>1,371</td><td>54.32</td><td>74,482</td><td>837,659</td></tr>
</tbody>
</table>

Appendix 5
Schedule 4
Monthly Change in Weather Normalization Reserve - January 1, 2016 to October 31, 2019

MM/YY	Heating Degree Days (below 18 deg C) Actual HDD	10 Year Average Monthly HDD	Variation from 10 Year Average HDD	Space heating load Coefficient (MWh/HDD)	Variation from Average (MWh)	Marginal Net Revenue ($/MWh)	Weather Normalization Reserve Increase (Decrease) ($)	Balance Owing (Recoverable) ($)
January, 2016	713	753.9	(40.9)	41.73	(1,707)	50.42	(86,055)	(86,055)
February, 2016	608	688.2	(80.2)	41.73	(3,347)	50.42	(168,743)	(254,798)
March, 2016	654	637.2	16.8	41.73	701	50.42	35,348	(219,450)
April,2016	475	420.6	54.4	41.73	2,270	50.42	114,459	(104,991)
May, 2016	259	264.5	(5.5)	41.73	(230)	50.42	(11,572)	(116,563)
June, 2016	121	110.0	11.0	41.73	459	50.42	23,144	(93,419)
July, 2016	30	16.5	13.5	41.73	563	50.42	28,404	(65,014)
August, 2016	23	24.2	(1.2)	41.73	(50)	50.42	(2,525)	(67,539)
September, 2016	101	107.1	(6.1)	41.73	(255)	50.42	(12,835)	(80,374)
October, 2016	255	272.8	(17.8)	41.73	(743)	50.42	(37,452)	(117,825)
November, 2016	401	421.8	(20.8)	41.73	(868)	50.42	(43,764)	(161,589)
December, 2016	665	622.1	42.9	41.73	1,790	50.42	90,263	(71,327)
January, 2017	712	751.4	(39.4)	43.21	(1,702)	49.56	(84,375)	(155,701)
February, 2017	657	704.2	(47.2)	43.21	(2,040)	49.56	(101,078)	(256,779)
March, 2017	690	646.1	43.9	43.21	1,897	49.56	94,011	(162,768)
April,2017	416	433.7	(17.7)	43.21	(765)	49.56	(37,904)	(200,672)
May, 2017	264	256.4	7.6	43.21	328	49.56	16,275	(184,397)
June, 2017	94	114.6	(20.6)	43.21	(890)	49.56	(44,115)	(228,512)
July, 2017	27	16.4	10.6	43.21	458	49.56	22,700	(205,812)
August, 2017	29	22.8	6.2	43.21	268	49.56	13,277	(192,535)
September, 2017	92	106.2	(14.2)	43.21	(614)	49.56	(30,409)	(222,944)
October, 2017	203	279.6	(76.8)	43.21	(3,319)	49.56	(164,466)	(387,410)
November, 2017	440	423.6	16.1	43.21	696	49.56	34,478	(352,932)
December, 2017	695	613.8	81.6	43.21	3,526	49.56	174,745	(178,187)
January, 2018	764	760.1	4.3	46.66	201	51.38	10,309	(167,878)
February, 2018	621	697.3	(76.5)	46.66	(3,569)	51.38	(183,400)	(351,278)
March, 2018	602	652.1	(50.1)	46.66	(2,338)	51.38	(120,109)	(471,388)
April,2018	445	440.1	5.0	46.66	233	51.38	11,987	(459,401)
May, 2018	280	261.9	18.0	46.66	840	51.38	43,153	(416,248)
June, 2018	168	121.2	47.2	46.66	2,202	51.38	113,157	(303,091)
July, 2018	14	18.9	(4.9)	46.66	(229)	51.38	(11,747)	(314,838)
August, 2018	9	19.9	(10.5)	46.66	(490)	51.38	(25,173)	(340,011)
September, 2018	125	104.7	20.0	46.66	933	51.38	47,948	(292,063)
October, 2018	338	276.1	62.1	46.66	2,898	51.38	148,878	(143,185)
November, 2018	520	426.3	93.2	46.66	4,349	51.38	223,437	80,252
December, 2018	709	621.1	87.9	46.66	4,101	51.38	210,731	290,983
January, 2019	757	757.6	(1.1)	50.19	(55)	54.32	(2,999)	287,984
February, 2019	737	686.7	50.1	50.19	2,515	54.32	136,587	424,571
March, 2019	638	656.8	(19.3)	50.19	(969)	54.32	(52,617)	371,954
April,2019	449	432.6	16.2	50.19	813	54.32	44,166	416,120
May, 2019	352	257.5	94.1	50.19	4,723	54.32	256,544	672,664
June, 2019	106	118.5	(12.6)	50.19	(632)	54.32	(34,351)	638,313
July, 2019	26	18.7	6.8	50.19	341	54.32	18,539	656,851
August, 2019	17	19.0	(1.7)	50.19	(85)	54.32	(4,635)	652,217
September, 2019	143	101.9	40.7	50.19	2,043	54.32	110,960	763,177
October, 2019	299	271.6	27.3	50.19	1,371	54.32	74,482	837,659

kWh Sales (from Sales Frcst)

	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	
RESIDENTIAL URBAN	12,625,982	12,403,908	13,153,051	12,317,370	13,663,399	16,879,259	21,574,139	20,940,285	17,206,133	18,115,400	13,960,248	12,756,452	excludes seasonals
RESIDENTIAL RURAL	23,477,622	23,720,372	24,053,024	24,047,236	30,982,752	39,777,068	47,538,669	42,694,844	35,364,571	35,916,148	27,818,390	26,063,605	excludes seasonals
GENERAL SERVICE 1	30,536,731	31,603,406	32,205,080	29,694,829	29,822,755	31,963,582	34,932,089	35,594,755	31,123,775	32,214,430	29,585,993	29,769,881	excludes seasonals
SMALL INDUSTRIAL	9,657,947	10,489,446	10,663,230	9,156,747	8,217,190	7,530,934	7,118,503	7,293,702	6,214,915	6,702,079	7,045,245	8,608,563	
MWh	76,298	78,217	80,074	75,216	82,686	96,151	111,163	106,524	89,909	92,948	78,410	77,199	1,044,796

kWh Sales (from Sales Frcst)

					ACTUAL						FORECAST		
	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	
RESIDENTIAL URBAN & RURAL	69,978,778	72,257,912	62,242,138	53,862,230	47,157,176	42,647,846	35,800,697	40,884,008	38,476,665	38,482,664	51,076,086	65,084,129	617,950,328 rural and urban
GENERAL SERVICE 1	35,051,135	36,775,814	33,429,040	32,422,341	30,128,438	29,754,023	29,057,650	32,522,299	31,388,442	28,854,185	33,248,236	34,874,102	387,505,705
SMALL INDUSTRIAL	7,447,164	7,497,263	6,671,027	6,736,363	7,111,026	8,628,560	8,234,404	8,393,738	8,314,196	7,820,842	7,693,694	7,047,925	91,596,203

Sales Revenue (from Sales Frcst)

					ACTUAL						FORECAST		
	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	
RESIDENTIAL URBAN & RURAL	9,678,473	9,942,179	8,651,227	7,582,348	6,676,144	6,043,265	5,078,549	5,797,602	5,472,316	5,475,023	7,020,461	8,846,864	86,264,450 rural and urban
GENERAL SERVICE 1	5,485,019	5,718,230	5,283,005	5,140,735	4,783,140	4,748,294	4,646,591	5,127,654	4,981,024	4,620,256	5,143,705	5,396,413	61,074,065
SMALL INDUSTRIAL	1,036,989	1,024,760	947,273	943,588	1,036,919	1,206,526	1,179,003	1,196,533	1,176,611	1,126,375	970,916	908,251	12,753,746

Attachment B – Revised WNR

Month	Normal	1990	2002	2003	2004	2005	2006		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	10 year average (2008 - 2017)
Jan	805	728	745	864	898	854	626		737	728	866	686	744	715	812	771	829	713	712	758
Feb	730	764	679	761	731	698	677		763	686	664	608	697	700	672	717	858	628	657	689
Mar	655	683	633	695	656	654	594		643	694	675	556	621	572	603	760	743	654	690	657
Apr	460	442	451	483	441	406	411		491	418	420	367	420	379	441	453	537	475	416	433
May	277	337	265	310	292	314	204		308	286	245	262	259	224	235	308	233	259	264	258
Jun	114	81	161	101	149	117	55		121	95	102	114	150	119	107	120	163	121	94	119
Jul	30	33	41	6	29	29	5		29	0	42	13	21	12	13	1	28	30	27	19
Aug	35	15	35	33	19	17	52		38	20	30	21	14	5	17	28	3	23	29	19
Sep	138	141	108	68	146	82	116		120	121	135	107	90	76	106	118	73	101	92	102
Oct	315	258	342	258	256	247	290		248	300	345	290	249	240	291	228	315	255	203	272
Nov	471	467	486	432	462	402	374		446	421	392	429	397	424	472	461	420	401	440	426
Dec	685	610	677	606	654	628	592		733	620	643	515	569	589	744	582	545	665	695	617
		4,715	4,559	4,623	4,617	4,733	4,448	3,996	4,677	4,389	4,559	3,968	4,231	4,055	4,513	4,547	4,747	4,325	4,319	4,365
															Standard Deviation					239

Appendix 5
Schedule 1
Calculation of 10-Year Average HDD

		Appendix 5						

Appendix 5
Schedule 2
Calculation of MWh/HDD Coefficient

Year	Month	Days in month	Actual HDD	HDD per day	Reported sales (MWh)	Fewer hours of daylight	Average HDD per day	Average MWh per day
2017	Jul	31	27	0.9	76,298			
	Aug	31	29	0.9	78,217			
	Sep	30	92	3.1	80,074			
	Oct	31	203	6.5	75,216	2.52	4.8	2,507
	Nov	30	440	14.7	82,686	4.07	10.6	2,667
	Dec	31	695	22.4	96,151	5.21	18.5	3,205
2018	Jan	31	764	24.7	111,163	5.40	23.5	3,586
	Feb	28	621	22.2	106,524	4.53	23.4	3,436
	Mar	31	602	19.4	89,909	3.11	20.8	3,211
	Apr	30	445	14.8	92,948	1.53	17.1	2,998
	May	31	280	9.0	78,410	0.00	11.9	2,614
	Jun	30	168	5.6	77,199			

Linear regression results:
(Oct 2017 - May 2018)

HDD	Daylight hrs	b	
50.19	51.18	2039.06	coefficients
5.35	18.99	82.54	standard error coefficients
0.97	81.40	#N/A	R^2, standard error y
81.77	5.00	#N/A	F, degrees of freedom
1083543	33128.63	#N/A	Regression SS, residual SS
9.38	2.70	24.70	t values

Appendix 5
Schedule 3
Calculation of Forecast Marginal Net Revenue Rate for 2019

Appendix 5
Schedule 1

Rate Class	2019 (Forecast)		
	Revenue ($)	Sales (MWh)	Unit Revenue ($/MWh)
Residential	84,777,377	617,950	*
General Service	60,108,478	387,506	*
Small Industrial	12,759,419	91,596	
Total	157,645,274	1,097,052	$ 143.70
ECAM Base Rate			$ (91.61)
Marginal Net Revenue Rate			$ 52.09

* Excludes revenue and kWh sales from seasonal customers

Appendix 5
Schedule 4
Monthly Change in Weather Normalization Reserve - January 1, 2016 to October 31, 2019

| MM/YY | Heating Degree Days (below 18 deg C) | | | Space heating load | | | Weather Normalization Reserve | |
	Actual HDD	10 Year Average Monthly HDD	Variation from 10 Year Average HDD	Coefficient (MWh/HDD)	Variation from Average (MWh)	Marginal Net Revenue ($/MWh)	Increase (Decrease) ($)	Balance Owing (Recoverable) ($)
January, 2016	713.0	753.9	(40.9)	41.73	(1,707)	50.42	(86,055)	(86,055)
February, 2016	628.2	688.2	(60.0)	41.73	(2,504)	50.42	(126,242)	(212,296)
March, 2016	654.0	637.2	16.8	41.73	701	50.42	35,348	(176,949)
April,2016	475.0	420.6	54.4	41.73	2,270	50.42	114,459	(62,490)
May, 2016	259.0	264.5	(5.5)	41.73	(230)	50.42	(11,572)	(74,062)
June, 2016	121.0	110.0	11.0	41.73	459	50.42	23,144	(50,917)
July, 2016	30.0	16.5	13.5	41.73	563	50.42	28,404	(22,513)
August, 2016	23.0	24.2	(1.2)	41.73	(50)	50.42	(2,525)	(25,038)
September, 2016	101.0	107.1	(6.1)	41.73	(255)	50.42	(12,835)	(37,872)
October, 2016	255.0	272.8	(17.8)	41.73	(743)	50.42	(37,452)	(75,324)
November, 2016	401.0	421.8	(20.8)	41.73	(868)	50.42	(43,764)	(119,088)
December, 2016	665.0	620.5	44.5	41.73	1,857	50.42	93,629	(25,459)
January, 2017	712.0	751.4	(39.4)	43.21	(1,702)	49.56	(84,375)	(109,833)
February, 2017	657.0	704.2	(47.2)	43.21	(2,040)	49.56	(101,078)	(210,912)
March, 2017	690.0	646.1	43.9	43.21	1,897	49.56	94,011	(116,900)
April,2017	416.0	433.7	(17.7)	43.21	(765)	49.56	(37,904)	(154,805)
May, 2017	264.0	256.4	7.6	43.21	328	49.56	16,275	(138,529)
June, 2017	94.0	114.6	(20.6)	43.21	(890)	49.56	(44,115)	(182,644)
July, 2017	27.0	16.4	10.6	43.21	458	49.56	22,700	(159,944)
August, 2017	29.0	22.8	6.2	43.21	268	49.56	13,277	(146,667)
September, 2017	92.0	106.2	(14.2)	43.21	(614)	49.56	(30,409)	(177,076)
October, 2017	202.8	279.6	(76.8)	43.21	(3,319)	49.56	(164,466)	(341,542)
November, 2017	439.7	423.6	16.1	43.21	696	49.56	34,478	(307,064)
December, 2017	695.4	613.2	82.2	43.21	3,552	49.56	176,030	(131,034)
January, 2018	764.4	760.1	4.3	46.66	201	51.38	10,309	(120,725)
February, 2018	620.8	699.3	(78.5)	46.66	(3,663)	51.38	(188,195)	(308,920)
March, 2018	602.0	652.1	(50.1)	46.66	(2,338)	51.38	(120,109)	(429,030)
April,2018	445.1	440.1	5.0	46.66	233	51.38	11,987	(417,043)
May, 2018	279.9	261.9	18.0	46.66	840	51.38	43,153	(373,890)
June, 2018	168.4	121.2	47.2	46.66	2,202	51.38	113,157	(260,733)
July, 2018	14.0	18.9	(4.9)	46.66	(229)	51.38	(11,747)	(272,480)
August, 2018	9.4	19.9	(10.5)	46.66	(490)	51.38	(25,173)	(297,653)
September, 2018	124.7	104.7	20.0	46.66	933	51.38	47,948	(249,705)
October, 2018	338.7	276.1	62.6	46.66	2,921	51.38	150,077	(99,628)
November, 2018	519.5	426.3	93.2	46.66	4,349	51.38	223,437	123,809
December, 2018	709.0	620.5	88.5	46.66	4,129	51.38	212,169	335,978
January, 2019	756.5	757.6	(1.1)	50.19	(55)	52.09	(2,876)	333,102
February, 2019	736.8	688.7	48.1	50.19	2,414	52.09	125,750	458,852
March, 2019	637.5	656.8	(19.3)	50.19	(969)	52.09	(50,457)	408,395
April,2019	448.8	432.6	16.2	50.19	813	52.09	42,352	450,747
May, 2019	351.6	257.5	94.1	50.19	4,723	52.09	246,010	696,757
June, 2019	105.9	118.5	(12.6)	50.19	(632)	52.09	(32,941)	663,817
July, 2019	25.5	18.7	6.8	50.19	341	52.09	17,778	681,594
August, 2019	17.3	19.0	(1.7)	50.19	(85)	52.09	(4,444)	677,150
September, 2019	142.6	101.9	40.7	50.19	2,043	52.09	106,404	783,554
October, 2019	298.9	271.6	27.3	50.19	1,371	52.09	71,424	854,977

kWh Sales (from Sales Frcst)

	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	
RESIDENTIAL URBAN	12,625,982	12,403,908	13,153,051	12,317,370	13,663,399	16,879,259	21,574,139	20,940,285	17,206,133	18,115,400	13,960,248	12,756,452	excludes seasonals
RESIDENTIAL RURAL	23,477,622	23,720,372	24,053,024	24,047,236	30,982,752	39,777,068	47,538,669	42,694,844	35,364,571	35,916,148	27,818,390	26,063,605	excludes seasonals
GENERAL SERVICE 1	30,536,731	31,603,406	32,205,080	29,694,829	29,822,755	31,963,582	34,932,089	35,594,755	31,123,775	32,214,430	29,585,993	29,769,881	excludes seasonals
SMALL INDUSTRIAL	9,657,947	10,489,446	10,663,230	9,156,747	8,217,190	7,530,934	7,118,503	7,293,702	6,214,915	6,702,079	7,045,245	8,608,563	
MWh	76,298	78,217	80,074	75,216	82,686	96,151	111,163	106,524	89,909	92,948	78,410	77,199	1,044,796

kWh Sales (from Sales Frcst)

	ACTUAL										FORECAST		
	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	
RESIDENTIAL URBAN & RURAL	69,978,778	72,257,912	62,242,138	53,862,230	47,157,176	42,647,846	35,800,697	40,884,008	38,476,665	38,482,664	51,076,086	65,084,129	617,950,328 rural and urban
GENERAL SERVICE 1	35,051,135	36,775,814	33,429,040	32,422,341	30,128,438	29,754,023	29,057,650	32,522,299	31,388,442	28,854,185	33,248,236	34,874,102	387,505,705
SMALL INDUSTRIAL	7,447,164	7,497,263	6,671,027	6,736,363	7,111,026	8,628,560	8,234,404	8,393,738	8,314,196	7,820,842	7,693,694	7,047,925	91,596,203

Revised Sales Revenue (from Sales Frcst)

	ACTUAL										FORECAST		
	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	
RESIDENTIAL URBAN & RURAL	9,469,400	9,739,625	8,475,305	7,418,237	6,537,796	5,923,334	4,972,696	5,674,449	5,348,210	5,350,999	7,020,461	8,846,864	84,777,377 rural and urban
GENERAL SERVICE 1	5,386,773	5,615,783	5,185,843	5,015,085	4,699,300	4,652,755	4,558,749	5,035,000	4,881,224	4,537,848	5,143,705	5,396,413	60,108,478
SMALL INDUSTRIAL	1,022,588	1,004,068	928,570	924,996	1,017,315	1,182,711	1,156,276	1,173,388	1,153,605	1,104,789	1,078,944	1,012,169	12,759,419

	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
Small Industrial $/kWh	0.137312366	0.133924599	0.13919453	0.13731385	0.1430616	0.13706931	0.14042016	0.139793271	0.13875129	0.141262211	0.140237374	0.143612329

Previous Amounts Submitted

	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
RESIDENTIAL URBAN & RURAL	9,678,473	9,942,179	8,651,227	7,582,348	6,676,144	6,043,265	5,078,549	5,797,602	5,472,316	5,475,023	7,020,461	8,846,864
GENERAL SERVICE 1	5,485,019	5,718,230	5,283,005	5,140,735	4,783,140	4,748,294	4,646,591	5,127,654	4,981,024	4,620,256	5,143,705	5,396,413
SMALL INDUSTRIAL	1,036,989	1,024,760	947,273	943,588	1,036,919	1,206,526	1,179,003	1,196,533	1,176,611	1,126,375	970,916	908,251

ECAM Adjustment

	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
RESIDENTIAL URBAN & RURAL	(193,141)	(199,432)	(171,788)	(148,660)	(130,154)	(117,708)	(98,810)	(112,840)	(106,196)	(106,212)		
GENERAL SERVICE 1	(96,741)	(101,501)	(92,264)	(89,486)	(83,154)	(82,121)	(80,199)	(89,762)	(86,632)	(79,638)		
SMALL INDUSTRIAL	(20,554)	(20,692)	(18,412)	(18,592)	(19,626)	(23,815)	(22,727)	(23,167)	(22,947)	(21,586)		

Revenue Adjustments

	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19
RESIDENTIAL URBAN & RURAL	(15,931)	(3,122)	(4,134)	(15,451)	(8,194)	(2,223)	(7,043)	(10,313)	(17,911)	(17,812)		
GENERAL SERVICE 1	(1,505)	(946)	(4,897)	(36,164)	(685)	(13,418)	(7,642)	(2,892)	(13,167)	(2,771)		
SMALL INDUSTRIAL	6,153	-	(291)	-	22	-	-	21	(59)	-		

Forecast Adjustment to Small Industrial

	Nov-19	Dec-19
	108,028	103,918