

Nicole McKenna

From: Crockett, Gloria <CrockettGL@maritimeelectric.com>
Sent: November 27, 2019 10:24 AM
To: Brown, Angie
Cc: Brockway, Tom; Griffiths, Barry; Roberts, Jason
Subject: RE: Weather Normalization Reserve
Attachments: 2016 GRA - Section 7 - filed October 28, 2015.pdf; Annual Update of the Weather Normalization Reserve filed October 31 2016.pdf; Annual Update of the Weather Normalization Reserve filed October 31 2017.pdf; Appendix 5 - Weather Normalization Reserve.xlsx; 2016 GRA APPENDIX 6 - Weather Normalization Reserve.pdf

Good morning Angie,

In Section 5.2 and Appendix 5 of the General Rate Application(GRA), Maritime Electric submitted evidence to the Commission to update the components to the Weather Normalization Reserve Account (WNRA) for 2019 based on our GRA forecast inputs. Since January 2019, we have been recording the monthly adjustments to the WNRA based the components proposed in the GRA filing.

The attached spreadsheet provides updates to Appendix 5 of the GRA based on the Commission GRA Order UE19-08 as follows:

- Appendix 5 Schedule 1 – Calculation of 10-Year Average Heating Degree Days (HDD) – No changes from the original GRA filing.
- Appendix 5 Schedule 2 – Calculation of MWH/HDD Coefficient – No change from the original GRA filing.
- Appendix 5 Schedule 3 – Calculation of Forecast Marginal Net Revenue Rate for 2019 has increased from the \$52.48 per kWh proposed in the Application to \$54.32 per kWh, a difference of \$1.84 per kWh as a result of the following:
 - o The forecast Unit Revenue has been updated to reflect year-to date sales to the end of October 2019 and current forecast sales for November and December 2019 and has increased by \$0.10 per kWh from \$145.83 proposed in the Application to \$145.93. The supporting kWh sales and revenue data is provided for your information in a separate sheet in the attached spreadsheet.
 - o As per Order UE19-08, the ECAM base rate has remained unchanged in 2019 at \$91.61 per kWh. The GRA proposed an increase in the ECAM base rate \$93.35 per kWh. This results in an increase in the Marginal Net Revenue Rate of \$1.74 per kWh.
- Appendix 5 Schedule 4 – Monthly Change in the Weather Normalization Reserve – January 1, 2016 to October 31, 2019 has been updated to reflect the revised Marginal Net Revenue of \$54.32 per kWh for 2019 as proposed in the attached Appendix 5 Schedule 3.
 - o Since January 2019, the Company has been recording the monthly adjustments to the WNRA based the components proposed in the GRA filing and the balance in the WNRA on October 31, 2019 was a payable to customers of \$819,094. The proposed update to the Marginal Net Revenue for 2019 will result in an adjustment (increase to the payable) of \$18,565 for January to October 2019.

I have also attached evidence from Section 7 and Appendix 6 of our 2016 GRA which introduced the Weather Normalization Reserve as well as the updates that were filed with the Commission for the 2017 & 2018 components for your information.

If you have any questions, please do not hesitate to reach out.

Sincerely,

Gloria

Gloria Crockett, CPA, CA > **MANAGER, REGULATORY & FINANCIAL PLANNING**

180 Kent Street, Charlottetown, PE C1A 7N2

telephone 902-629-3641

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maritimeelectric.com

**All our energy.
All the time.**



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Nicole McKenna

From: Crockett, Gloria <CrockettGL@maritimeelectric.com>
Sent: November 27, 2019 10:46 AM
To: Brown, Angie
Cc: Brockway, Tom; Griffiths, Barry; Roberts, Jason
Subject: RE: Weather Normalization Reserve

Hi Angie,

It just dawned on me after I sent the email below that I referred to the Marginal Net Revenue on a per kWh basis. It should be on a per MWh basis. Please see my highlighted changes below.

My apologies for the confusion,

Gloria

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From: Crockett, Gloria
Sent: Wednesday, November 27, 2019 10:24 AM
To: 'Brown, Angie' <Angie.Brown@ca.gt.com>
Cc: 'Brockway, Tom' <Tom.Brockway@ca.gt.com>; 'Griffiths, Barry' <Barry.Griffiths@ca.gt.com>; Roberts, Jason <RobertsJS@maritimeelectric.com>
Subject: RE: Weather Normalization Reserve

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In Section 5.2 and Appendix 5 of the General Rate Application(GRA), Maritime Electric submitted evidence to the Commission to update the components to the Weather Normalization Reserve Account (WNRA) for 2019 based on our GRA forecast inputs. Since January 2019, we have been recording the monthly adjustments to the WNRA based the components proposed in the GRA filing.

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7.0 ENERGY SALES FORECAST

7.1 Economic Outlook²

The Conference Board of Canada, in its most recent Provincial Economic Outlook publications, provides the following outlook for Prince Edward Island.

“Thanks to the one-two punch of construction and manufacturing, as well as a surging export sector, the Island possesses solid economic prospects this year and next. The past winter saw a record amount of snowfall that postponed the opening of lobster season; however, despite the winter setback, the fishing industry is still expected to perform well this year, thanks to strong demand for lobster from China. In general, the Island’s export sector will be a major positive for the province due mainly to a booming U.S. economy and the weaker Canadian dollar. As well, building construction intentions are strong for 2015 and that, combined with a surge in housing starts next year, will support the construction sector over the near term. All these signs point to a healthy economy over the next two years on the Island, putting the province ahead of the national average. In particular, real GDP is expected to grow by 2.4 per cent this year and 1.9 per cent in 2016. The recently re-elected Liberal government released its annual budget on June 19 and, as expected, the province continued its mandate of controlled spending. Despite the frugality, the province had to push out its balanced-budget target by one year to 2016-17. Tight spending measures translate into weak growth in non-commercial services such as education and health and social services, which puts a damper on overall economic growth. This makes the positive economic outlook for the Island that much more impressive. With the combination of a strong economy and tighter spending, the province should certainly achieve its new fiscal balance goal for 2016-17.”

7.2 Weather Normalization Reserve

Weather normalization reserves are common in approach throughout the utility industry and are part of a broader group of deferral reserves designed to mitigate volume or demand fluctuations. The purpose of a Weather Normalization

² See attached Appendix 5 - The Conference Board of Canada - Provincial Outlook Executive Summary and Provincial Outlook Economic Forecast (Summer 2015)

SECTION 7 – ENERGY SALES FORECAST

Reserve is to stabilize electricity rates to customers by removing the volatility in sales and energy supply costs caused by temperature changes relative to historical averages. Where the Heating Degree Days³ (HDD) variation is above normal, the Company will experience incremental marginal net revenue (revenue less energy costs) which would need to be returned to customers but when HDD variation is below normal there will be a shortfall in net revenue which will need to be recovered from customers.

Due to increases in the use of electricity for space heating in recent years, Maritime Electric's sales revenues and energy supply costs have become subject to greater volatility due to variations in the number of HDDs from normal or historic levels.

To mitigate this increasing volatility and uncertainty with respect to customer electricity rates, the Company is proposing the implementation of a Weather Normalization Reserve effective January 1, 2016.

Conceptually, the balance in the Weather Normalization Reserve on the Company's balance sheet will represent the cumulative change in contribution from sales resulting from variations in HDD from normal and should, over time, net to zero (contribution equals revenue from additional kWh sales minus the cost of purchasing additional kWh sales or marginal net revenue times the additional kWh sales). As illustrated in Schedule 1 of Appendix 6, in a year when HDD are higher than normal (2013 and 2014), a marginal net revenue amount will be subtracted on the Company's income statement and added to the Reserve. When HDD are lower than normal (2010 – 2012), a marginal net revenue amount will be added to the Company's income statement and subtracted from the Reserve. Over the ten year period, the variation from average HDD balances to zero as

³ http://climate.weather.gc.ca/glossary_e.html - Heating degree-days for a given day are the number of degrees Celsius that the mean temperature is below 18°C. If the temperature is equal to or greater than 18°C, then the number will be zero. For example, a day with a mean temperature of 15.5°C has 2.5 heating degree-days; a day with a mean temperature of 20.5°C has zero heating degree-days.

SECTION 7 – ENERGY SALES FORECAST

does the balance in the reserve account. Thus, there would be no need for an adjustment mechanism to deal with Reserve balances if approved by the Commission.

The following describes the components and operation of the Weather Normalization Reserve.

Determination of Average HDD Value

The first step in establishing the mechanics of the Weather Normalization Reserve is the determination of the Average HDD Value. The Company proposes using the rolling 10 year average HDD value based upon the most recent 10 years of information available as measured by Environment Canada for the Charlottetown Airport weather station. As calculated in Schedule 2 of Appendix 6, the average annual HDD value to be used for 2016 is calculated to be 4,339 (2005-2014).

Calculation of MWh/HDD Coefficient

The next step is the determination of the annual MWh/HDD Coefficient (the “Coefficient”) to be used for the upcoming year using econometric modelling. As shown in Schedule 3 of Appendix 6, using a linear regression analysis the Company has calculated the Coefficient at 41.73 (based on October 2014 to May 2015 data), which is the estimated change in MWh sales (customer usage) resulting from a unit variation in HDD (i.e. 41.73 MWh per HDD). The Company has excluded from the analysis the data for the months of June to September as these months are primarily cooling months, which would distort the Coefficient calculation for HDD and reduce its accuracy. In addition, only sales for year round Residential, General Service and Small Industrial classes were used as these are the only classes materially affected by variations in HDD.

Calculation of Marginal Net Revenue

The final variable is the Marginal Net Revenue rate which is calculated as the

October 21, 2015

SECTION 7 – ENERGY SALES FORECAST

forecast unit revenue per kWh less the forecast energy cost per kWh. For the same reason noted above, the Company recommends that the unit revenue be comprised of only demand and energy charge revenues (i.e. excluding the service charge or site revenue) for Residential, General Service and Small Industrial classes as these are the only revenue factors and rate classes affected by variations in HDD. In addition, with the proposed continued operation of the ECAM, the energy cost per kWh is set in the Company's income statement at the Base Rate in the ECAM as approved by the Commission. Schedule 4 of Appendix 6 shows the calculation of the Marginal Net Revenue Rate of \$50.42/MWh based upon the proposals contained in this Application.

Summary

To mitigate the increased volatility resulting from the growing load of electricity for space heating, the Company requests that the Commission approve the adoption of a Weather Normalization Reserve, effective January 1, 2016. The Company proposes to calculate the Weather Normalization Reserve adjustment on a monthly basis as described above so that timely adjustments can be made to address the variations caused by HDD.

7.3 Energy Sales Forecast

The energy sales forecast is the basis of the short-term and long-term energy supply planning process. The sales forecast is used to calculate the total energy required to serve customers and the associated energy related costs. The development of the sales growth forecast involves a detailed sales regression analysis which reflects a number of variables such as population growth, changes in the Consumer Price Index, the number of customers expected to exit and enter the system, furnace oil prices, heating and cooling degree day experience and the rate of adoption of electricity based space heating. Management also conducts a review of trends in historic sales growth which includes a two-year average growth rate calculation and an analysis of year-to-date growth over the previous

SECTION 7 – ENERGY SALES FORECAST

period. These results are then compared to actual results to date and any other known economic inputs. Based on this process, a forecast of energy sales is made.

Schedule 7-1 shows the results of the regression analysis model, the two-year average growth rate calculation and the year-to-date growth over the previous period for 2014-2016.

| SCHEDULE 7-1 | | | |
|----------------------------|------------------------|--------------------------|--------------------------|
| Energy Sales (GWh) | | | |
| Measure | 2014 Actual | 2015 Forecast | 2016 Forecast |
| Regression analysis growth | 1,167.7 | 1,195.3 | 1,193.8 |
| Two-year average growth | 1,173.3 | 1,207.1 | 1,249.5 |
| Year-to-date growth | 1,167.7 | 1,203.5 | 1,243.3 |

There are a number of factors contributing to the lower sales growth level forecast for 2016 based on regression analysis as compared to the forecasts based on historical/trend analysis. These include:

- the closure of the McCain Foods processing facility in Borden-Carleton in October 2014;
- an assumption of Heating Degree Days based upon a 10 year historical average for 2016, whereas HDD for 2015 are forecast to be above average (the two year average and year to date growth rate projections reflect above normal Heating Degree Days experience in recent years).
- the large reduction in oil prices beginning in the fourth quarter of 2014, which is expected to reduce the growth in electric space heating as compared to prior years. The US Energy Information Agency's ("EIA") oil price forecast shows that oil prices are not expected to increase significantly until 2016; and

October 21, 2015

SECTION 7 – ENERGY SALES FORECAST

- the Company’s proposed Demand Side Management plan filed with IRAC which will have a minimal electricity sales impact of 0.1 per cent annually starting in 2016.
- the transition to more energy efficient LED street and area lighting.

Management’s forecast of energy sales for 2015 and 2016 is based upon the energy sales regression analysis for the above stated reasons. Schedule 7-2 shows the actual energy sales for 2014 and the forecast of energy sales for 2015 and 2016.

| SCHEDULE 7-2 | | | |
|---------------------------------|------------------------|--------------------------|--------------------------|
| Energy Sales (GWh) (%) | | | |
| | 2014 Actual | 2015 Forecast | 2016 Forecast |
| Energy Sales (GWh) | | | |
| Residential | 541.4 | 573.0 | 563.7 |
| General Service I | 377.2 | 378.1 | 381.0 |
| General Service II ⁴ | 9.4 | 10.1 | 10.8 |
| Large Industrial | 142.2 | 132.6 | 131.3 |
| Small Industrial | 88.9 | 93.1 | 98.9 |
| Street Lighting/Unmetered | 8.6 | 8.4 | 8.1 |
| Total Energy Sales | 1,167.7 | 1,195.3 | 1,193.8 |
| Growth Rate (%) | | | |
| Residential | 5.27 | 5.84 | (1.62) |
| General Service I | 1.81 | 0.24 | 0.77 |
| General Service II ⁴ | - | 7.45 | 6.93 |
| Large Industrial | (0.84) | (6.75) | (0.98) |
| Small Industrial | 9.89 | 7.72 | 6.23 |
| Street Lighting/Unmetered | - | (2.33) | (3.57) |
| Overall Growth Rate | 3.60 | 2.36 | (0.13) |

⁴ The Company is proposing in Section 13 of this Application, that customers currently in the General Service II rate class begin to be billed as General Service I customers effective March 1, 2016.

SECTION 7 – ENERGY SALES FORECAST

7.4 Summary

A summary of this section follows:

- The Company proposes the adoption of a Weather Normalization Reserve to adjust the marginal net revenue associated with sales variances caused by fluctuations in temperature.
- Energy sales are forecast to be 1,195.3 GWh for 2015 and 1,193.8 GWh for 2016.

October 21, 2015

APPENDIX 6 - SCHEDULE 1

Illustration of Annual Change in Weather Normalization Reserve

| Year | Heating Degree Days (below 18 deg C) | | Space heating load | | Marginal Net Revenue (\$/MWh) | Weather Normalization Reserve | |
|------|---|---|--------------------------|--------------------------------------|---------------------------------------|----------------------------------|--|
| | Actual HDD | Variation from Average (4,339 days) | Coefficient (MWh/HDD) | Variation from Average (MWh) | | Increase (Decrease) (\$) | Balance Owing (Recoverable) (\$) |
| 2005 | 4,448 | 109 | 41.73 | 4,553 | 50.42 | 229,577 | 229,577 |
| 2006 | 3,996 | (343) | 41.73 | (14,310) | 50.42 | (721,558) | (491,981) |
| 2007 | 4,677 | 338 | 41.73 | 14,110 | 50.42 | 711,458 | 219,477 |
| 2008 | 4,389 | 50 | 41.73 | 2,091 | 50.42 | 105,425 | 324,901 |
| 2009 | 4,559 | 220 | 41.73 | 9,186 | 50.42 | 463,153 | 788,054 |
| 2010 | 3,968 | (371) | 41.73 | (15,479) | 50.42 | (780,478) | 7,575 |
| 2011 | 4,231 | (108) | 41.73 | (4,503) | 50.42 | (227,052) | (219,477) |
| 2012 | 4,055 | (284) | 41.73 | (11,848) | 50.42 | (597,406) | (816,882) |
| 2013 | 4,519 | 180 | 41.73 | 7,516 | 50.42 | 378,981 | (437,901) |
| 2014 | 4,547 | 208 | 41.73 | 8,685 | 50.42 | 437,901 | (0) |
| | | (0) | | (0) | | | |

APPENDIX 6 - SCHEDULE 2
Calculation of 10-Year Average HDD

| Month | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 10 year average (2005 - 2014) | |
|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--|------------|
| Jan | 854 | 626 | 737 | 728 | 866 | 686 | 744 | 715 | 812 | 771 | 754 | |
| Feb | 698 | 677 | 763 | 686 | 664 | 608 | 697 | 700 | 672 | 717 | 688 | |
| Mar | 654 | 594 | 643 | 694 | 675 | 556 | 621 | 572 | 603 | 760 | 637 | |
| Apr | 406 | 411 | 491 | 418 | 420 | 367 | 420 | 379 | 441 | 453 | 421 | |
| May | 314 | 204 | 308 | 286 | 245 | 262 | 259 | 224 | 235 | 308 | 265 | |
| Jun | 117 | 55 | 121 | 95 | 102 | 114 | 150 | 119 | 107 | 120 | 110 | |
| Jul | 29 | 5 | 29 | 0 | 42 | 13 | 21 | 12 | 13 | 1 | 17 | |
| Aug | 17 | 52 | 38 | 20 | 30 | 21 | 14 | 5 | 17 | 28 | 24 | |
| Sep | 82 | 116 | 120 | 121 | 135 | 107 | 90 | 76 | 106 | 118 | 107 | |
| Oct | 247 | 290 | 248 | 300 | 345 | 290 | 249 | 240 | 291 | 228 | 273 | |
| Nov | 402 | 374 | 446 | 421 | 392 | 429 | 397 | 424 | 472 | 461 | 422 | |
| Dec | 628 | 592 | 733 | 620 | 643 | 515 | 569 | 589 | 750 | 582 | 622 | |
| | 4,448 | 3,996 | 4,677 | 4,389 | 4,559 | 3,968 | 4,231 | 4,055 | 4,519 | 4,547 | 4,339 | |
| | | | | | | | | | | | Standard Deviation | 258 |

APPENDIX 6 - SCHEDULE 3
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 |
|------|-------|---------------|------------|-------------|------------------------|-------------------------|---------------------|---------------------|
| 2014 | Jul | 31 | 1 | 0.0 | 70,921 | | | |
| | Aug | 31 | 28 | 0.9 | 79,973 | | | |
| | Sep | 30 | 118 | 3.9 | 74,136 | | | |
| | Oct | 31 | 228 | 7.4 | 72,767 | 2.52 | 5.6 | 2,426 |
| | Nov | 30 | 461 | 15.4 | 84,725 | 4.07 | 11.4 | 2,733 |
| | Dec | 31 | 582 | 18.8 | 88,471 | 5.21 | 17.1 | 2,949 |
| 2015 | Jan | 31 | 829 | 26.7 | 103,575 | 5.40 | 22.8 | 3,341 |
| | Feb | 28 | 858 | 30.6 | 107,097 | 4.53 | 28.7 | 3,455 |
| | Mar | 31 | 743 | 24.0 | 95,132 | 3.11 | 27.3 | 3,398 |
| | Apr | 30 | 537 | 17.9 | 90,109 | 1.53 | 20.9 | 2,907 |
| | May | 31 | 233 | 7.5 | 78,424 | 0.00 | 12.7 | 2,614 |
| | Jun | 30 | - | - | 72,384 | | | |

Linear regression results:
(Oct 2014 - May 2015)

| | | | |
|---------|--------------|---------|-----------------------------------|
| HDD | Daylight hrs | b | |
| 41.73 | 50.89 | 2045.89 | coefficients |
| 3.43 | 14.71 | 69.33 | standard error coefficients |
| 0.98 | 68.90 | #N/A | R ² , standard error y |
| 106.89 | 5.00 | #N/A | F, degrees of freedom |
| 1014942 | 23737.67 | #N/A | Regression SS, residual SS |
| 12.17 | 3.46 | 29.51 | t values |

APPENDIX 6 - SCHEDULE 4

Calculation of Forecast Marginal Net Revenue Rate for 2016

| Rate Class | 2016 (Forecast) | | Unit Revenue (\$/MWh) |
|---------------------------|---------------------------|------------------|--------------------------|
| | Revenue (\$) | Sales (MWh) | |
| Residential | 70,955,849 | 545,578 | * |
| General Service I | 55,143,280 | 372,955 | * |
| General Service II | 1,530,913 | 10,751 | |
| Small Industrial | 12,692,471 | 98,933 | |
| Total | 140,322,513 | 1,028,217 | \$ 136.47 |
| ECAM Base Rate (Proposed) | | | <u>\$ (86.05)</u> |
| | Marginal Net Revenue Rate | | <u>\$ 50.42</u> |

* Excludes revenue and kWh sales from seasonal customers



October 31, 2016

Island Regulatory & Appeals Commission
PO Box 577
Charlottetown PE C1A 7L1

Dear Commissioners:

Pursuant to Order UE16-04, please find enclosed 10 copies of Maritime Electric's Application and Evidence in support of proposed revisions to the components of the interim Weather Normalization Mechanism and Reserve effective January 1, 2017. An electronic copy will follow.

If you require further information, please do not hesitate to contact me at (902) 629-3667.

Yours truly,

MARITIME ELECTRIC

Steve D. Loggie
Vice President,
Finance & Chief Financial Officer

SLD45
Encl. as noted

Maritime Electric

CANADA

PROVINCE OF PRINCE EDWARD ISLAND

**BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION**

IN THE MATTER of Section 20 of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving revisions to the components of the interim Weather Normalization Mechanism and Reserve effective January 1, 2017 and for certain approvals incidental to such an order.

Date: October 31, 2016

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APPENDICES

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October 31, 2016

2.0 APPLICATION

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

**BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION**

IN THE MATTER of Section 20 of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving revisions to the components of the interim Weather Normalization Mechanism and Reserve effective January 1, 2017 and for certain approvals incidental to such an order.

Introduction

1. Maritime Electric Company, Limited (“Maritime Electric” or “the Company”) is a public utility subject to the Electric Power Act (“EPA” or “the Act”) engaged in the production, purchase, transmission, distribution and sale of electricity within Prince Edward Island.
2. In recent years, Maritime Electric’s sales revenue and energy supply costs have become subject to greater volatility due to variations in temperature from historical averages and increases in the use of electricity for space heating. To mitigate this increasing electricity and the resulting uncertainty with respect to customer rates, the Company sought approval to adopt a Weather Normalization Mechanism and Reserve as part of its General Rate Application filed on October 28, 2016.

October 31, 2016

SECTION 2 - APPLICATION

3. On February 29, 2016, IRAC issued Order 16-04 which, among other things, approved the adoption of the proposed Weather Normalization Mechanism and Reserve on an interim basis, effective January 1, 2016. The “Application” section of the approved Weather Normalization Mechanism and Reserve requires that revisions to the components of the formulas contained therein are to be submitted to the Commission for approval on or before October 31st of the year prior to the effective date of the change.

Application

4. Maritime Electric hereby applies for an Order of the Island Regulatory and Appeals Commission (“IRAC” or “the Commission”) approving revisions to the components of the interim Weather Normalization Mechanism and Reserve effective January 1, 2017 and for certain approvals incidental to such an Order.
5. The proposals contained in this Application represent a just and reasonable balance of the interests of Maritime Electric and those of its customers and will, if approved, allow the Company to continue to provide a high level of service to customers at a cost that is, in all circumstances, reasonable.

Procedure

6. Filed hereto is the Affidavit of Steven D. Loggie and Angus S. Orford which contains the evidence on which Maritime Electric relies in this Application.

October 31, 2016

SECTION 2 - APPLICATION

Dated at Charlottetown, Province of Prince Edward Island, this 31st day of October, 2016.



D. Spencer Campbell, Q.C.

STEWART MCKELVEY
65 Grafton Street, PO Box 2140
Charlottetown PE C1A 8B9
Telephone: (902) 629-4549
Facsimile: (902) 892-2485
Solicitors of Maritime Electric Company, Limited

October 31, 2016

3.0 AFFIDAVIT

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

**BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION**

IN THE MATTER of Section 20 of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving revisions to the components of the interim Weather Normalization Mechanism and Reserve effective January 1, 2017 and for certain approvals incidental to such an order.

We, Steven David Loggie and Angus Sumner Orford of Charlottetown, in Queens County, Province of Prince Edward Island, MAKE OATH AND SAY AS FOLLOWS:

1. We are the Vice President, Finance and Chief Financial Officer and Vice President, Corporate Planning and Energy Supply for Maritime Electric Company, Limited (“Maritime Electric” or the “Company”) respectively and as such have personal knowledge of the matters deposed to herein, except where noted, in which case we rely upon the information of others and in which case we verily believe such information to be true.
2. Maritime Electric is a public utility subject to the provisions of the Electric Power Act (“EPA”) engaged in the production, purchase, transmission, distribution and sale of electricity within Prince Edward Island.

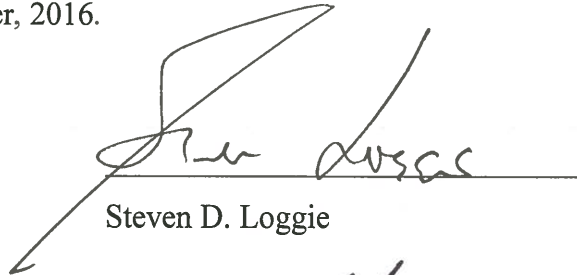
October 31, 2016

SECTION 3 - AFFIDAVIT

3. We prepared or supervised the preparation of the evidence and to the best of our knowledge and belief the evidence is true in substance and in fact. A copy of the evidence is attached to this our Affidavit, and is collectively known as Exhibit "A", contained at Sections 4 through 6 and Appendices A through C inclusive.

4. Section 7 contains a Proposed Order of the Commission based on the Company's Application.

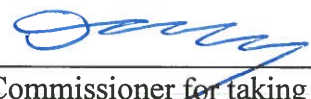
SWORN TO SEVERALLY at
Charlottetown, Prince Edward
Island, the 31st day of October, 2016.
Before me:



Steven D. Loggie



Angus S. Orford



A Commissioner for taking affidavits
in the Supreme Court of Prince Edward Island.

October 31, 2016

4.0 INTRODUCTION

4.1 Corporate Profile

Maritime Electric Company, Limited owns and operates a fully integrated system providing for the purchase, generation, transmission, distribution and sale of electricity throughout Prince Edward Island. The Company’s head office is located in Charlottetown with generating facilities in Charlottetown and Borden-Carleton. The Company has contractual entitlement to capacity and energy from NB Power’s Point Lepreau Nuclear Generating Station (“Point Lepreau”) and an agreement for the purchase of capacity and system energy from NB Power delivered via two submarine cables leased from the Province of Prince Edward Island. The Company purchases 92.5 MW of wind powered energy under contract with the PEI Energy Corporation.

4.2 Overview of Evidence

Weather normalization reserves are common in approach throughout the utility industry and are part of a broader group of deferral reserves designed to mitigate volume or demand fluctuations. The purpose of a Weather Normalization Reserve (the “Reserve”) is to stabilize electricity rates charged to customers by removing the volatility in sales and energy supply costs caused by temperature changes relative to historical averages. Where the Heating Degree Days¹ (“HDD”) variation is above normal (colder temperature than historical average), the Company will experience incremental marginal net revenue (revenue less energy costs) which would need to be returned to customers but when HDD variation is below normal (warmer temperature than historical average) there will be a shortfall in net revenue which will need to be recovered from customers.

¹ http://climate.weather.gc.ca/glossary_e.html - Heating degree-days for a given day are the number of degrees Celsius that the mean temperature is below 18°C. If the temperature is equal to or greater than 18°C, then the number will be zero. For example, a day with a mean temperature of 15.5°C has 2.5 heating degree-days; a day with a mean temperature of 20.5°C has zero heating degree-days.

SECTION 4 – INTRODUCTION

In recent years, Maritime Electric’s sales revenues and energy supply costs have become subject to greater volatility due to variations in the number of HDDs and increases in the use of electricity for space heating. To mitigate this increasing volatility and the resulting uncertainty with respect to customer electricity rates, the Company submitted a proposal to adopt a Weather Normalization Reserve as part of its General Rate Application filed on October 28, 2015.

In Commission Orders UE16-04 and UE16-04R, the Commission granted interim approval to adopt a Weather Normalization Reserve for the period January 1, 2016 to February 28, 2019 but expressed concerns about the impact that the Reserve may have on the Rate of Return Adjustment (“RORA”) account. As a result the Commission also ordered the Company to provide the monthly balance of the Weather Normalization Reserve as part of its monthly reporting requirements to IRAC and to also file the year-end balance of the Weather Normalization Reserve on or before February 28th of each of 2017, 2018 and 2019. The Commission has indicated it will determine whether to approve a permanent Weather Normalization Reserve based on its review of these monthly and annual reports.

The interim Weather Normalization Reserve approved by the Commission is included as Appendix A of this evidence. As described in the Appendix, there are a number of variables used in calculating the monthly Reserve adjustment that are determined based upon the most recent data available which, at the time of initial filing, was comprised of 2014 and 2015 data.

The “Application” section of the interim Weather Normalization Reserve states that “Revisions to the components of the MWh Variation from Average and Marginal Net Revenue formulas for a calendar year are to be submitted to the Commission for approval on or before October 31st of the year prior thereto.” The evidence in this Application is filed in support of the proposed revisions to these components for the period beginning January 1, 2017.

October 31, 2016

SECTION 5 – REVISED COMPONENTS OF THE WEATHER NORMALIZATION RESERVE

5.0 PROPOSED REVISIONS TO COMPONENTS OF THE WEATHER NORMALIZATION RESERVE

5.1 Contribution to the Weather Normalization Reserve

The balance of the Weather Normalization Reserve on the Company’s balance sheet represents the cumulative monthly change in the contribution of sales resulting from variations in HDD from the normal ten year average.

When HDD in a month are higher than the normal ten year average for that month, a marginal net revenue amount will be subtracted on the Company’s income statement and added to the Reserve as an amount owing to the customer. However, when HDD in a month are lower than the normal ten year average for that month, a marginal net revenue amount will be added to the Company’s income statement and subtracted from the Reserve as an amount recoverable from the customer. Appendix B provides the monthly change in the Reserve from January 1, 2016 to September 30, 2016.

As a formula, the monthly contribution to the Weather Normalization Reserve is a product of the two components as expressed below:

$$\text{Contributions to Weather Normalization Reserve} = \text{MWh Variation From Average} \times \text{Marginal Net Revenue}$$

Where,

$$\text{MWh Variation from Average} = (\text{Actual HDD Value} - \text{Average HDD Value}) \times (\text{MWh per HDD Coefficient})$$

$$\text{Marginal Net Revenue} = \text{Forecast Unit Revenue per MWh} - \text{Forecast Unit Energy Cost per MWh}$$

October 31, 2016

SECTION 5 – REVISED COMPONENTS OF THE WEATHER NORMALIZATION RESERVE

5.2 MWh Variation From Average

There are two elements of the MWh Variation from Average components that require revision for the period beginning January 1, 2017:

- Average HDD value; and
- MWh per HDD Coefficient

5.2.1 Average HDD Value

The Average HDD Value is calculated using the rolling 10 year average HDD value based upon the most recent 10 years of information available as measured by Environment Canada for the Charlottetown Airport weather station.

For 2016, the Average HDD Value of 4,339 was calculated based upon the ten year period from 2005-2014. The revised average HDD Value proposed to be used for 2017 is 4,369 based upon the years 2006-2015 as calculated in Appendix C – Schedule 1.

5.2.2 MWh Per HDD Coefficient

The determination of the MWh Per HDD Coefficient (the “Coefficient”) to be used for the upcoming year is calculated using econometric modelling with a linear regression analysis. The linear regression analysis identifies the estimated change in MWh sales (customer usage) resulting from a unit variation in HDD.

For 2016, the Coefficient of 41.73 MWh per HDD was calculated based upon the data from October 2014 to May 2015. The revised Coefficient proposed for 2017 is 43.21 MWh per HDD based upon the data from October 2015 to May 2016 as calculated in Appendix C – Schedule 2.

October 31, 2016

SECTION 5 – REVISED COMPONENTS OF THE WEATHER NORMALIZATION RESERVE

5.3 Marginal Net Revenue

The Marginal Net Revenue rate is calculated as the Forecast Unit Revenue per MWh less the Forecast Unit Energy Cost per MWh. As a result, there are two elements of the Marginal Net Revenue component that require revision for the period beginning January 1, 2017:

- Forecast Unit Revenue per MWh; and
- Forecast Unit Energy Cost per MWh

5.3.1 Forecast Unit Revenue Per MWh

For 2016, the Forecast Unit Revenue per MWh of \$136.47 was based upon the forecast 2016 information filed with the Company's General Rate Application on October 28, 2015. The revised Forecast Unit Revenue per MWh proposed for 2017 has been updated with actual results to September 30, 2016 and reflects the 2017 rate adjustments approved by IRAC in Order UE16-04. Using these inputs, the Forecast Unit Revenue per MWh for 2017 is \$139.44 as detailed in Appendix C – Schedule 3.

5.3.2 Forecast Unit Energy Cost Per MWh

The Forecast Unit Energy Cost per MWh is to be revised based upon the Commission approved Base Rate for the Energy Cost Adjustment Mechanism for the particular year. In Order UE16-04, IRAC approved the Schedule of Inputs which included the 2016 Base Rate of \$86.05 per MWh that is currently used in the Marginal Net Revenue calculation. For 2017, the Schedule of Inputs approved in UE16-04 sets the Base Rate at \$89.88 per MWh. This rate is included in Appendix C – Schedule 3.

**SECTION 5 – REVISED COMPONENTS OF THE WEATHER NORMALIZATION
RESERVE**

5.3.3 Summary

Using the Forecast Unit Revenue per MWh and Forecast Unit Energy Cost per MWh for 2017 as described above, the 2017 Marginal Net Revenue Rate is calculated to be \$49.56 per MWh as detailed in Appendix C – Schedule 3.

October 31, 2016

SECTION 6 – SUMMARY

6.0 SUMMARY

The purpose of a Weather Normalization Reserve is to stabilize electricity rates charged to customers by removing the volatility in sales and energy supply costs caused by fluctuations in temperatures relative to historical averages. In recent years, Maritime Electric’s sales revenues and energy supply costs have become subject to greater volatility due to variations in temperatures and increases in the use of electricity for space heating. Upon application by the Company, the Weather Normalization Mechanism and Reserve was approved by IRAC, on an interim basis, in Order UE16-04 effective for the period January 1, 2016 to February 28, 2019.

The formula to calculate the monthly contribution to the Reserve is based upon a number of variables which are to be updated annually in accordance with the interim approval granted by IRAC in UE16-04. The variables are presented in the table below with the currently approved and proposed revised amounts effective January 1, 2017.

| Summary of Proposed Revisions to Weather Normalization Mechanism Variables | | |
|---|-------------------------------------|-------------------------------------|
| | Approved January 1, 2016 | Proposed January 1, 2017 |
| <u>MWH Variation from Average</u> | | |
| Average HDD Value | 4,339 | 4,369 |
| MWH per HDD Coefficient | 41.73 | 43.21 |
| | | |
| <u>Marginal Net Revenue</u> | | |
| Forecast Unit Revenue per MWh | 136.47 | 139.44 |
| Forecast Unit Energy Cost per MWh | 86.05 | 89.88 |

October 31, 2016

7.0 PROPOSED ORDER

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

BEFORE THE ISLAND REGULATORY

AND APPEALS COMMISSION

IN THE MATTER of Section 20 of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving revisions to the components of the Weather Normalization Reserve, including the MWh Variation from Average and Marginal Net Revenue, for the period beginning January 1, 2017 and for certain approvals incidental to such an order.

UPON receiving an Application by Maritime Electric Company, Limited (the “Company”) for approval of proposed revisions to the Weather Normalization Reserve;

AND UPON considering the Application and Evidence filed in support thereof;

NOW THEREFORE for the reasons given in the annexed Reasons for Order and pursuant to the Electric Power Act.

October 31, 2016

SECTION 7 - PROPOSED ORDER

IT IS ORDERED THAT

The revisions to the components of the interim Weather Normalization Reserve for the period beginning January 1, 2017 filed herein on October 31, 2016 and summarized below are approved:

| Approved Weather Normalization Mechanism Variables | | |
|---|------------------------|------------------------|
| | Effective Date | |
| | January 1, 2016 | January 1, 2017 |
| Average HDD Value | 4,339 | 4,369 |
| MWH per HDD Coefficient | 41.73 | 43.21 |
| Forecast Unit Revenue per MWh | 136.47 | 139.44 |
| Forecast Unit Energy Cost per MWh | 86.05 | 89.88 |

DATED at Charlottetown this ____ day of ____, 2016

BY THE COMMISSION:

_____, Chair

_____, Commissioner

_____, Commissioner

_____, Commissioner

October 31, 2016

APPENDIX A

**Interim Weather Normalization Mechanism and Reserve
effective January 1, 2016**

Appendix A
Interim Weather Normalization Mechanism and Reserve
Effective January 1, 2016

Purpose

The purpose of a Weather Normalization Reserve is to stabilize electricity rates to customers by removing the volatility in sales and energy supply costs caused by temperature changes relative to historical averages. Where the Heating Degree Days¹ (HDD) variation is above normal, the Company will experience incremental marginal net revenue (revenue less energy costs) which would need to be returned to customers but when HDD variation is below normal there will be a shortfall in net revenue which will need to be recovered from customers.

Calculation of Contribution to the Reserve

The balance in the Weather Normalization Reserve on the Company's balance sheet represents the cumulative monthly change in contribution from sales resulting from variations in HDD from normal and should, over time, net to zero.

As illustrated in Schedule 1, in a year when HDD are higher than normal (2013 and 2014), a marginal net revenue amount will be subtracted on the Company's income statement and added to the Reserve. When HDD are lower than normal (2010 – 2012), a marginal net revenue amount will be added to the Company's income statement and subtracted from the Reserve. Over the ten year period, the variation from average HDD balances to zero as does the balance in the reserve account.

As a formula,

$$\text{Contribution to Weather Normalization Reserve} = \text{MWh Variation from Average} \times \text{Marginal Net Revenue}$$

¹ http://climate.weather.gc.ca/glossary_e.html - Heating degree-days for a given day are the number of degrees Celsius that the mean temperature is below 18°C. If the temperature is equal to or greater than 18°C, then the number will be zero. For example, a day with a mean temperature of 15.5°C has 2.5 heating degree-days; a day with a mean temperature of 20.5°C has zero heating degree-days.

Appendix A
Interim Weather Normalization Mechanism and Reserve
Effective January 1, 2016

Where,

MWh Variation from Average = (Actual HDD Value - Average HDD Value) X (MWh per HDD Coefficient)

Marginal Net Revenue = Forecast Unit Revenue per MWh - Forecast Unit Energy Cost per MWh

The following describes the components and operation of the Weather Normalization Reserve.

Determination of Average HDD Value

The first step in establishing the mechanics of the Weather Normalization Reserve is the determination of the Average HDD Value using the rolling 10 year average HDD value based upon the most recent 10 years of information available as measured by Environment Canada for the Charlottetown Airport weather station. As calculated in Schedule 2, the average annual HDD value to be used for 2016 is calculated to be 4,339 (2005-2014).

Calculation of MWh/HDD Coefficient

The next step is the determination of the annual MWh/HDD Coefficient (the “Coefficient”) to be used for the upcoming year using econometric modelling. As shown in Schedule 3, using a linear regression analysis the Coefficient for 2016 is calculated at 41.73 (based on October 2014 to May 2015 data), which is the estimated change in MWh sales (customer usage) resulting from a unit variation in HDD (i.e. 41.73 MWh per HDD). The calculation excludes from the analysis the data for the months of June to September as these months are primarily cooling months, which would distort the Coefficient calculation for HDD and reduce its accuracy. In addition, only sales for year round Residential, General Service and Small Industrial classes are used as these are the only classes materially affected by variations in HDD.

Appendix A
Interim Weather Normalization Mechanism and Reserve
Effective January 1, 2016

Calculation of Marginal Net Revenue

The final variable is the Marginal Net Revenue rate which is calculated as the forecast unit revenue per MWh less the forecast unit energy cost per MWh. For the same reason noted above, the unit revenue is comprised of only demand and energy charge revenues (i.e. excluding the service charge or site revenue) for Residential, General Service and Small Industrial classes as these are the only revenue factors and rate classes affected by variations in HDD. In addition, the energy cost per MWh for the year is set at the Base Rate in the ECAM for the particular year as approved by the Commission. Schedule 4 shows the calculation of the 2016 Marginal Net Revenue Rate of \$50.42/MWh.

Application

The determination of the Weather Normalization Reserve adjustment on the Company's balance sheet is to be calculated on a monthly basis as described above, effective January 1, 2016.

Revisions to the components of MWh Variation from Average and Marginal Net Revenue formulas for a calendar year are to be submitted to the Commission for approval on or before October 31 of the year prior thereto.

APPENDIX B

Monthly Change in Weather Normalization Reserve 2016

APPENDIX B

Monthly Change in Weather Normalization Reserve - January 1 to September 30, 2016

| | Heating Degree Days (below 18 deg C) | | | Space heating load | | Marginal Net Revenue (\$/MWh) | Weather Normalization Reserve | |
|-----------|---|-----------------------------------|--|--------------------------|--------------------------------------|---------------------------------------|----------------------------------|--|
| | Actual HDD | 10 Year Average Monthly HDD | Variation from 10 Year Average HDD | Coefficient (MWh/HDD) | Variation from Average (MWh) | | Increase (Decrease) (\$) | Balance Owing (Recoverable) (\$) |
| 2016 | | | | | | | | |
| January | 713 | 753.9 | (40.9) | 41.73 | (1,707) | 50.42 | (86,055) | (86,055) |
| February | 608 | 688.2 | (80.2) | 41.73 | (3,347) | 50.42 | (168,743) | (254,798) |
| March | 654 | 637.2 | 16.8 | 41.73 | 701 | 50.42 | 35,348 | (219,450) |
| April | 475 | 420.6 | 54.4 | 41.73 | 2,270 | 50.42 | 114,459 | (104,991) |
| May | 259 | 264.5 | (5.5) | 41.73 | (230) | 50.42 | (11,572) | (116,563) |
| June | 121 | 110.0 | 11.0 | 41.73 | 459 | 50.42 | 23,144 | (93,419) |
| July | 30 | 16.5 | 13.5 | 41.73 | 563 | 50.42 | 28,404 | (65,014) |
| August | 23 | 24.2 | (1.2) | 41.73 | (50) | 50.42 | (2,525) | (67,539) |
| September | 101 | 107.1 | (6.1) | 41.73 | (255) | 50.42 | (12,835) | (80,374) |
| | | | <u>(38.2)</u> | | <u>(1,594)</u> | | | |

APPENDIX C

Schedule 1 – Calculation of 10 Year Average HDD

Schedule 2 – Calculation of MWh/HDD Coefficient

Schedule 3 – Calculation of Forecast Marginal net Revenue Rate

APPENDIX C - SCHEDULE 1
Calculation of 10-Year Average HDD

| Month | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 10 year average (2006 - 2015) | |
|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--|-----|
| Jan | 626 | 737 | 728 | 866 | 686 | 744 | 715 | 812 | 771 | 829 | 751 | |
| Feb | 677 | 763 | 686 | 664 | 608 | 697 | 700 | 672 | 717 | 858 | 704 | |
| Mar | 594 | 643 | 694 | 675 | 556 | 621 | 572 | 603 | 760 | 743 | 646 | |
| Apr | 411 | 491 | 418 | 420 | 367 | 420 | 379 | 441 | 453 | 537 | 434 | |
| May | 204 | 308 | 286 | 245 | 262 | 259 | 224 | 235 | 308 | 233 | 256 | |
| Jun | 55 | 121 | 95 | 102 | 114 | 150 | 119 | 107 | 120 | 163 | 115 | |
| Jul | 5 | 29 | 0 | 42 | 13 | 21 | 12 | 13 | 1 | 28 | 16 | |
| Aug | 52 | 38 | 20 | 30 | 21 | 14 | 5 | 17 | 28 | 3 | 23 | |
| Sep | 116 | 120 | 121 | 135 | 107 | 90 | 76 | 106 | 118 | 73 | 106 | |
| Oct | 290 | 248 | 300 | 345 | 290 | 249 | 240 | 291 | 228 | 315 | 280 | |
| Nov | 374 | 446 | 421 | 392 | 429 | 397 | 424 | 472 | 461 | 420 | 424 | |
| Dec | 592 | 733 | 620 | 643 | 515 | 569 | 589 | 750 | 582 | 545 | 614 | |
| | 3,996 | 4,677 | 4,389 | 4,559 | 3,968 | 4,231 | 4,055 | 4,519 | 4,547 | 4,747 | 4,369 | |
| | | | | | | | | | | | Standard Deviation | 288 |

APPENDIX C - 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 |
|-------------|--------------|------------------------------|-----------------------|------------------------|---------------------------------------|--|------------------------------------|------------------------------------|
| 2015 | Jul | 31 | 28 | 0.9 | 71,885 | | | |
| | Aug | 31 | 3 | 0.1 | 78,411 | | | |
| | Sep | 30 | 73 | 2.4 | 78,307 | | | |
| | Oct | 31 | 315 | 10.2 | 75,409 | 2.52 | 6.3 | 2,514 |
| | Nov | 30 | 420 | 14.0 | 83,793 | 4.07 | 12.1 | 2,703 |
| | Dec | 31 | 545 | 17.6 | 89,351 | 5.21 | 15.8 | 2,978 |
| 2016 | Jan | 31 | 713 | 23.0 | 100,977 | 5.40 | 20.3 | 3,257 |
| | Feb | 29 | 626 | 21.6 | 99,021 | 4.53 | 22.3 | 3,194 |
| | Mar | 31 | 654 | 21.1 | 92,025 | 3.11 | 21.3 | 3,173 |
| | Apr | 30 | 475 | 15.8 | 91,075 | 1.53 | 18.5 | 2,938 |
| | May | 31 | 259 | 8.4 | 78,214 | 0.00 | 12.1 | 2,607 |
| | Jun | 30 | 121 | 4.0 | 74,555 | | | |

Linear regression results:
(Oct 2015 - May 2016)

| | | | |
|--------|--------------|---------|-----------------------------------|
| HDD | Daylight hrs | b | |
| 43.21 | 41.56 | 2088.77 | coefficients |
| 4.19 | 12.40 | 67.01 | standard error coefficients |
| 0.97 | 56.99 | #N/A | R ² , standard error y |
| 84.77 | 5.00 | #N/A | F, degrees of freedom |
| 550733 | 16241.39 | #N/A | Regression SS, residual SS |
| 10.31 | 3.35 | 31.17 | t values |

APPENDIX C - SCHEDULE 3**Calculation of Forecast Marginal Net Revenue Rate for 2017**

| Rate Class | 2017 (Forecast) | | |
|---------------------------|---------------------------|----------------|--------------------------|
| | Revenue (\$) | Sales (MWh) | Unit Revenue (\$/MWh) |
| Residential | 73,230,009 | 551,106 | * |
| General Service | 59,250,917 | 393,947 | * |
| Small Industrial | 12,723,418 | 96,290 | |
| Total | 145,204,344 | 1,041,343 | \$ 139.44 |
| ECAM Base Rate (Proposed) | | | \$ (89.88) |
| | Marginal Net Revenue Rate | | \$ 49.56 |

* Excludes revenue and kWh sales from seasonal customers

RECEIVED

OCT 31 2017

**The Island Regulatory
and Appeals Commission**

October 31, 2017

Island Regulatory & Appeals Commission
PO Box 577
Charlottetown PE C1A 7L1

Dear Commissioners:

Pursuant to Order UE16-04, please find enclosed 10 copies of Maritime Electric's Application and Evidence in support of proposed revisions to the components of the interim Weather Normalization Mechanism and Reserve effective January 1, 2018. An electronic copy will follow.

If you require further information, please do not hesitate to contact me at (902) 629-3696.

Yours truly,

MARITIME ELECTRIC



Jason C. Roberts
Vice President,
Finance & Chief Financial Officer

JCR15
Encl. as noted

Maritime Electric

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

**BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION**

IN THE MATTER of Section 20 of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving revisions to the components of the interim Weather Normalization Mechanism and Reserve effective January 1, 2018 and for certain approvals incidental to such an order.

Date: October 31, 2017

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October 31, 2017

2.0 APPLICATION

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

**BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION**

IN THE MATTER of Section 20 of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving revisions to the components of the interim Weather Normalization Mechanism and Reserve effective January 1, 2018 and for certain approvals incidental to such an order.

Introduction

1. Maritime Electric Company, Limited (“Maritime Electric” or “the Company”) is a public utility subject to the Electric Power Act (“EPA” or “the Act”) engaged in the production, purchase, transmission, distribution and sale of electricity within Prince Edward Island.
2. In recent years, Maritime Electric’s sales revenue and energy supply costs have become subject to greater volatility due to variations in temperature from historical averages and increases in the use of electricity for space heating. To mitigate this increasing volatility and the resulting uncertainty with respect to customer rates, the Company sought approval to adopt a Weather Normalization Mechanism and Reserve as part of its General Rate Application filed on October 28, 2015.

October 31, 2017

SECTION 2 - APPLICATION

3. On February 29, 2016, IRAC issued Order UE16-04 which, among other things, approved the adoption of the proposed Weather Normalization Mechanism and Reserve on an interim basis, effective January 1, 2016. The “Application” section of the approved Weather Normalization Mechanism and Reserve requires that revisions to the components of the formulas contained therein are to be submitted to the Commission for approval on or before October 31st of the year prior to the effective date of the change.
4. On February 23, 2017, IRAC issued Order UE17-01 which approved revisions to the components of the formulas of the interim Weather Normalization Reserve for the 2017 fiscal year.

Application

5. Maritime Electric hereby applies for an Order of the Island Regulatory and Appeals Commission (“IRAC” or “the Commission”) approving revisions to the components of the interim Weather Normalization Mechanism and Reserve effective January 1, 2018 and for certain approvals incidental to such an Order.
6. The proposals contained in this Application represent a just and reasonable balance of the interests of Maritime Electric and those of its customers and will, if approved, allow the Company to continue to provide a high level of service to customers at a cost that is, in all circumstances, reasonable.

Procedure

7. Filed hereto is the Affidavit of Jason C. Roberts and Angus S. Orford which contains the evidence on which Maritime Electric relies in this Application.

October 31, 2017

SECTION 2 - APPLICATION

Dated at Charlottetown, Province of Prince Edward Island, this 31st day of October, 2017.



D. Spencer Campbell, Q.C.

STEWART MCKELVEY
65 Grafton Street, PO Box 2140
Charlottetown PE C1A 8B9
Telephone: (902) 629-4549
Facsimile: (902) 892-2485
Solicitors of Maritime Electric Company, Limited

October 31, 2017

3.0 AFFIDAVIT

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

**BEFORE THE ISLAND REGULATORY
AND APPEALS COMMISSION**

IN THE MATTER of Section 20 of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving revisions to the components of the interim Weather Normalization Mechanism and Reserve effective January 1, 2018 and for certain approvals incidental to such an order.

We, Jason Christopher Roberts and Angus Sumner Orford of Charlottetown, in Queens County, Province of Prince Edward Island, MAKE OATH AND SAY AS FOLLOWS:

1. We are the Vice President, Finance and Chief Financial Officer and Vice President, Corporate Planning and Energy Supply for Maritime Electric Company, Limited (“Maritime Electric” or the “Company”) respectively and as such have personal knowledge of the matters deposed to herein, except where noted, in which case we rely upon the information of others and in which case we verily believe such information to be true.
2. Maritime Electric is a public utility subject to the provisions of the Electric Power Act (“EPA”) engaged in the production, purchase, transmission, distribution and sale of electricity within Prince Edward Island.

October 31, 2017

SECTION 3 - AFFIDAVIT

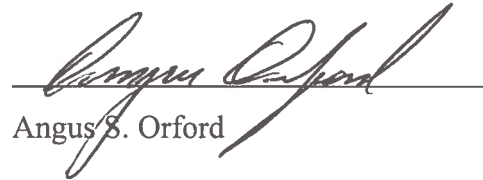
3. We prepared or supervised the preparation of the evidence and to the best of our knowledge and belief the evidence is true in substance and in fact. A copy of the evidence is attached to this our Affidavit, and is collectively known as Exhibit "A", contained at Sections 4 through 6 and Appendices A through C inclusive.

4. Section 7 contains a Proposed Order of the Commission based on the Company's Application.

SWORN TO SEVERALLY at
Charlottetown, Prince Edward
Island, the 31st day of October, 2017.
Before me:



Jason C. Roberts



Angus S. Orford



A Commissioner for taking affidavits
in the Supreme Court of Prince Edward Island.

October 31, 2017

4.0 INTRODUCTION

4.1 Corporate Profile

Maritime Electric Company, Limited owns and operates a fully integrated system providing for the purchase, generation, transmission, distribution and sale of electricity throughout Prince Edward Island. The Company’s head office is located in Charlottetown with generating facilities in Charlottetown and Borden-Carleton. The Company has contractual entitlement to capacity and energy from NB Power’s Point Lepreau Nuclear Generating Station (“Point Lepreau”) and an agreement for the purchase of capacity and system energy from NB Power delivered via two submarine cables leased from the Province of Prince Edward Island. The Company purchases 92.5 MW of wind powered energy under contract with the PEI Energy Corporation.

4.2 Overview of Evidence

Weather normalization reserves are common in approach throughout the utility industry and are part of a broader group of deferral reserves designed to mitigate volume or demand fluctuations. The purpose of a Weather Normalization Reserve (the “Reserve”) is to stabilize electricity rates charged to customers by removing the volatility in sales and energy supply costs caused by temperature changes relative to historical averages. Where the Heating Degree Days¹ (“HDD”) variation is above normal (colder temperature than historical average), the Company will experience incremental marginal net revenue (revenue less energy costs) which would need to be returned to customers but when HDD variation is below normal (warmer temperature than historical average) there will be a shortfall in net revenue which will need to be recovered from customers.

¹ http://climate.weather.gc.ca/glossary_e.html - Heating degree-days for a given day are the number of degrees Celsius that the mean temperature is below 18°C. If the temperature is equal to or greater than 18°C, then the number will be zero. For example, a day with a mean temperature of 15.5°C has 2.5 heating degree-days; a day with a mean temperature of 20.5°C has zero heating degree-days.

SECTION 4 – INTRODUCTION

In recent years, Maritime Electric’s sales revenues and energy supply costs have become subject to greater volatility due to variations in the number of HDDs and increases in the use of electricity for space heating. To mitigate this increasing volatility and the resulting uncertainty with respect to customer electricity rates, the Company submitted a proposal to adopt a Weather Normalization Reserve as part of its General Rate Application filed on October 28, 2015.

In Commission Orders UE16-04 and UE16-04R, the Commission granted interim approval to adopt a Weather Normalization Reserve for the period January 1, 2016 to February 28, 2019 but expressed concerns about the impact that the Reserve may have on the Rate of Return Adjustment (“RORA”) account. As a result the Commission also ordered the Company to provide the monthly balance of the Weather Normalization Reserve as part of its monthly reporting requirements to IRAC and to also file the year-end balance of the Weather Normalization Reserve on or before February 28th of each of 2017, 2018 and 2019. The Commission has indicated it will determine whether to approve a permanent Weather Normalization Reserve based on its review of these monthly and annual reports.

The interim Weather Normalization Reserve approved by the Commission is included as Appendix A of this evidence. As described in the Appendix, there are a number of variables used in calculating the monthly Reserve adjustment that are determined based upon the most recent data available which, at the time of initial filing, was comprised of 2014 and 2015 data.

The “Application” section of the interim Weather Normalization Reserve states that “Revisions to the components of the MWh Variation from Average and Marginal Net Revenue formulas for a calendar year are to be submitted to the Commission for approval on or before October 31st of the year prior thereto.” On October 31, 2016, the Company filed an application with the Commission to update the components of the Weather Normalization Reserve for the 2017 fiscal

October 31, 2017

SECTION 4 – INTRODUCTION

year. On February 23, 2017, Commission Order UE17-01 approved this application as filed. The evidence in this Application is filed in support of the proposed revisions to these components for the period beginning January 1, 2018.

October 31, 2017

SECTION 5 – REVISED COMPONENTS OF THE WEATHER NORMALIZATION RESERVE

5.0 PROPOSED REVISIONS TO COMPONENTS OF THE WEATHER NORMALIZATION RESERVE

5.1 Contribution to the Weather Normalization Reserve

The balance of the Weather Normalization Reserve on the Company’s balance sheet represents the cumulative monthly change in the contribution of sales resulting from variations in HDD from the normal ten year average.

When HDD in a month are higher than the normal ten year average for that month, a marginal net revenue amount will be subtracted on the Company’s income statement and added to the Reserve as an amount owing to the customer. However, when HDD in a month are lower than the normal ten year average for that month, a marginal net revenue amount will be added to the Company’s income statement and subtracted from the Reserve as an amount recoverable from the customer. Appendix B provides the monthly change in the Reserve from January 1, 2016 to September 30, 2017.

As a formula, the monthly contribution to the Weather Normalization Reserve is a product of the two components as expressed below:

$$\text{Contributions to Weather Normalization Reserve} = \frac{\text{MWh Variation From Average}}{\text{MWh Variation From Average}} \times \frac{\text{Marginal Net Revenue}}{\text{Marginal Net Revenue}}$$

Where,

$$\text{MWh Variation from Average} = (\text{Actual HDD Value} - \text{Average HDD Value}) \times (\text{MWh per HDD Coefficient})$$

$$\text{Marginal Net Revenue} = \text{Forecast Unit Revenue per MWh} - \text{Forecast Unit Energy Cost per MWh}$$

October 31, 2017

5.2 MWh Variation From Average

There are two elements of the MWh Variation from Average components that require revision for the period beginning January 1, 2018:

- Average HDD value; and
- MWh per HDD Coefficient

5.2.1 Average HDD Value

The Average HDD Value is calculated using the rolling 10 year average HDD value based upon the most recent 10 years of information available as measured by Environment Canada for the Charlottetown Airport weather station.

For 2017, the Average HDD Value of 4,369 was calculated based upon the ten year period from 2006-2015. The revised average HDD Value proposed to be used for 2018 is 4,400 based upon the years 2007-2016 as calculated in Appendix C – Schedule 1.

5.2.2 MWh Per HDD Coefficient

The determination of the MWh Per HDD Coefficient (the “Coefficient”) to be used for the upcoming year is calculated using econometric modelling with a linear regression analysis. The linear regression analysis identifies the estimated change in MWh sales (customer usage) resulting from a unit variation in HDD.

For 2017, the Coefficient of 43.21 MWh per HDD was calculated based upon the data from October 2015 to May 2016. The revised Coefficient proposed for 2018 is 46.66 MWh per HDD based upon the data from October 2016 to May 2017 as calculated in Appendix C – Schedule 2.

SECTION 5 – REVISED COMPONENTS OF THE WEATHER NORMALIZATION RESERVE

5.3 Marginal Net Revenue

The Marginal Net Revenue rate is calculated as the Forecast Unit Revenue per MWh less the Forecast Unit Energy Cost per MWh. As a result, there are two elements of the Marginal Net Revenue component that require revision for the period beginning January 1, 2018:

- Forecast Unit Revenue per MWh; and
- Forecast Unit Energy Cost per MWh

5.3.1 Forecast Unit Revenue Per MWh

For 2017, the Forecast Unit Revenue per MWh of \$139.44 was based upon the forecast 2017 information filed with the Company's General Rate Application on October 28, 2015. The revised Forecast Unit Revenue per MWh proposed for 2018 has been updated with actual results to September 30, 2017 and reflects the 2018 rate adjustments approved by IRAC in Order UE16-04. Using these inputs, the Forecast Unit Revenue per MWh for 2018 is \$142.99 as detailed in Appendix C – Schedule 3.

5.3.2 Forecast Unit Energy Cost Per MWh

The Forecast Unit Energy Cost per MWh is to be revised based upon the Commission approved Base Rate for the Energy Cost Adjustment Mechanism for the particular year. In Order UE16-04, IRAC approved the Schedule of Inputs which included the 2017 Base Rate of \$89.88 per MWh that is currently used in the Marginal Net Revenue calculation. For 2018, the Schedule of Inputs approved in UE16-04 sets the Base Rate at \$91.61 per MWh. This rate is included in Appendix C – Schedule 3.

October 31, 2017

SECTION 5 – REVISED COMPONENTS OF THE WEATHER NORMALIZATION RESERVE

5.3.3 Summary

Using the Forecast Unit Revenue per MWh and Forecast Unit Energy Cost per MWh for 2018 as described above, the 2018 Marginal Net Revenue Rate is calculated to be \$51.38 per MWh as detailed in Appendix C – Schedule 3.

October 31, 2017

6.0 SUMMARY

The purpose of a Weather Normalization Reserve is to stabilize electricity rates charged to customers by removing the volatility in sales and energy supply costs caused by fluctuations in temperatures relative to historical averages. In recent years, Maritime Electric’s sales revenues and energy supply costs have become subject to greater volatility due to variations in temperatures and increases in the use of electricity for space heating. Upon application by the Company, the Weather Normalization Mechanism and Reserve was approved by IRAC, on an interim basis, in Order UE16-04 effective for the period January 1, 2016 to February 28, 2019.

The formula to calculate the monthly contribution to the Reserve is based upon a number of variables which are to be updated annually in accordance with the interim approval granted by IRAC in UE16-04. The variables are presented in the table below with the currently approved and proposed revised amounts effective January 1, 2018.

| Summary of Proposed Revisions to Weather Normalization Mechanism Variables | | |
|---|-------------------------------------|-------------------------------------|
| | Approved January 1, 2017 | Proposed January 1, 2018 |
| <u>MWH Variation from Average</u> | | |
| Average HDD Value | 4,369 | 4,400 |
| MWH per HDD Coefficient | 43.21 | 46.66 |
| | | |
| <u>Marginal Net Revenue</u> | | |
| Forecast Unit Revenue per MWh | 139.44 | 142.99 |
| Forecast Unit Energy Cost per MWh | 89.88 | 91.61 |

7.0 PROPOSED ORDER

C A N A D A

PROVINCE OF PRINCE EDWARD ISLAND

BEFORE THE ISLAND REGULATORY

AND APPEALS COMMISSION

IN THE MATTER of Section 20 of the *Electric Power Act* (R.S.P.E.I. 1988, Cap. E-4) and **IN THE MATTER** of the Application of Maritime Electric Company, Limited for an order of the Commission approving revisions to the components of the Weather Normalization Reserve, including the MWh Variation from Average and Marginal Net Revenue, for the period beginning January 1, 2018 and for certain approvals incidental to such an order.

UPON receiving an Application by Maritime Electric Company, Limited (the “Company”) for approval of proposed revisions to the Weather Normalization Reserve;

AND UPON considering the Application and Evidence filed in support thereof;

NOW THEREFORE for the reasons given in the annexed Reasons for Order and pursuant to the Electric Power Act.

October 31, 2017

SECTION 7 - PROPOSED ORDER

IT IS ORDERED THAT

The revisions to the components of the interim Weather Normalization Reserve for the period beginning January 1, 2018 filed herein on October 31, 2017 and summarized below are approved:

| Approved Weather Normalization Mechanism Variables | | |
|---|------------------------|------------------------|
| | Effective Date | |
| | January 1, 2017 | January 1, 2018 |
| Average HDD Value | 4,369 | 4,400 |
| MWH per HDD Coefficient | 43.21 | 46.66 |
| Forecast Unit Revenue per MWh | 139.44 | 142.99 |
| Forecast Unit Energy Cost per MWh | 89.88 | 91.61 |

DATED at Charlottetown this ____ day of ____, 2017

BY THE COMMISSION:

_____, Chair

_____, Commissioner

_____, Commissioner

_____, Commissioner

October 31, 2017

APPENDIX A

**Interim Weather Normalization Mechanism and Reserve
effective January 1, 2017**

Appendix A
Interim Weather Normalization Mechanism and Reserve
Effective January 1, 2017

Purpose

The purpose of a Weather Normalization Reserve is to stabilize electricity rates to customers by removing the volatility in sales and energy supply costs caused by temperature changes relative to historical averages. Where the Heating Degree Days¹ (HDD) variation is above normal, the Company will experience incremental marginal net revenue (revenue less energy costs) which would need to be returned to customers but when HDD variation is below normal there will be a shortfall in net revenue which will need to be recovered from customers.

Calculation of Contribution to the Reserve

The balance in the Weather Normalization Reserve on the Company's balance sheet represents the cumulative monthly change in contribution from sales resulting from variations in HDD from normal and should, over time, net to zero.

As illustrated in Schedule 1, in a year when HDD are higher than normal (2013 and 2014), a marginal net revenue amount will be subtracted on the Company's income statement and added to the Reserve. When HDD are lower than normal (2010 – 2012), a marginal net revenue amount will be added to the Company's income statement and subtracted from the Reserve. Over the ten year period, the variation from average HDD balances to zero as does the balance in the reserve account.

As a formula,

$$\text{Contribution to Weather Normalization Reserve} = \text{MWh Variation from Average} \times \text{Marginal Net Revenue}$$

¹ http://climate.weather.gc.ca/glossary_e.html - Heating degree-days for a given day are the number of degrees Celsius that the mean temperature is below 18°C. If the temperature is equal to or greater than 18°C, then the number will be zero. For example, a day with a mean temperature of 15.5°C has 2.5 heating degree-days; a day with a mean temperature of 20.5°C has zero heating degree-days.

Appendix A
Interim Weather Normalization Mechanism and Reserve
Effective January 1, 2017

Where,

MWh Variation from Average = (Actual HDD Value - Average HDD Value) X (MWh per HDD Coefficient)

Marginal Net Revenue = Forecast Unit Revenue per MWh - Forecast Unit Energy Cost per MWh

The following describes the components and operation of the Weather Normalization Reserve.

Determination of Average HDD Value

The first step in establishing the mechanics of the Weather Normalization Reserve is the determination of the Average HDD Value using the rolling 10 year average HDD value based upon the most recent 10 years of information available as measured by Environment Canada for the Charlottetown Airport weather station. As calculated in Schedule 2, the average annual HDD value to be used for 2016 is calculated to be 4,339 (2005-2014).

Calculation of MWh/HDD Coefficient

The next step is the determination of the annual MWh/HDD Coefficient (the “Coefficient”) to be used for the upcoming year using econometric modelling. As shown in Schedule 3, using a linear regression analysis the Coefficient for 2016 is calculated at 41.73 (based on October 2014 to May 2015 data), which is the estimated change in MWh sales (customer usage) resulting from a unit variation in HDD (i.e. 41.73 MWh per HDD). The calculation excludes from the analysis the data for the months of June to September as these months are primarily cooling months, which would distort the Coefficient calculation for HDD and reduce its accuracy. In addition, only sales for year round Residential, General Service and Small Industrial classes are used as these are the only classes materially affected by variations in HDD.

Appendix A
Interim Weather Normalization Mechanism and Reserve
Effective January 1, 2017

Calculation of Marginal Net Revenue

The final variable is the Marginal Net Revenue rate which is calculated as the forecast unit revenue per MWh less the forecast unit energy cost per MWh. For the same reason noted above, the unit revenue is comprised of only demand and energy charge revenues (i.e. excluding the service charge or site revenue) for Residential, General Service and Small Industrial classes as these are the only revenue factors and rate classes affected by variations in HDD. In addition, the energy cost per MWh for the year is set at the Base Rate in the ECAM for the particular year as approved by the Commission. Schedule 4 shows the calculation of the 2016 Marginal Net Revenue Rate of \$50.42/MWh.

Application

The determination of the Weather Normalization Reserve adjustment on the Company's balance sheet is to be calculated on a monthly basis as described above, effective January 1, 2016.

Revisions to the components of MWh Variation from Average and Marginal Net Revenue formulas for a calendar year are to be submitted to the Commission for approval on or before October 31 of the year prior thereto.

APPENDIX B

Monthly Change in Weather Normalization Reserve 2017

APPENDIX B

Monthly Change in Weather Normalization Reserve - January 1, 2016 to September 30, 2017

| MM/YY | Heating Degree Days (below 18 deg C) | | | Space heating load | | Marginal Net Revenue (\$/MWh) | Weather Normalization Reserve | |
|-----------------|---|------------------------|-----------------------------|--------------------------|-------------------------|---------------------------------------|----------------------------------|--|
| | Actual HDD | 10 Year | Variation | Coefficient (MWh/HDD) | Variation | | Increase (Decrease) (\$) | Balance Owing (Recoverable) (\$) |
| | | Average Monthly HDD | from 10 Year Average HDD | | from Average (MWh) | | | |
| 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 | - | 279.6 | | | | | | |
| November, 2017 | - | 423.6 | | | | | | |
| December, 2017 | - | 613.8 | | | | | | |
| | | | (104.7) | | (4,474) | | | |

APPENDIX C

Schedule 1 – Calculation of 10 Year Average HDD

Schedule 2 – Calculation of MWh/HDD Coefficient

Schedule 3 – Calculation of Forecast Marginal net Revenue Rate

APPENDIX C - SCHEDULE 1**Calculation of 10-Year Average HDD**

| Month | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 10 year average (2007 - 2016) |
|--------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--|
| Jan | 737 | 728 | 866 | 686 | 744 | 715 | 812 | 771 | 829 | 713 | 760 |
| Feb | 763 | 686 | 664 | 608 | 697 | 700 | 672 | 717 | 858 | 608 | 697 |
| Mar | 643 | 694 | 675 | 556 | 621 | 572 | 603 | 760 | 743 | 654 | 652 |
| Apr | 491 | 418 | 420 | 367 | 420 | 379 | 441 | 453 | 537 | 475 | 440 |
| May | 308 | 286 | 245 | 262 | 259 | 224 | 235 | 308 | 233 | 259 | 262 |
| Jun | 121 | 95 | 102 | 114 | 150 | 119 | 107 | 120 | 163 | 121 | 121 |
| Jul | 29 | 0 | 42 | 13 | 21 | 12 | 13 | 1 | 28 | 30 | 19 |
| Aug | 38 | 20 | 30 | 21 | 14 | 5 | 17 | 28 | 3 | 23 | 20 |
| Sep | 120 | 121 | 135 | 107 | 90 | 76 | 106 | 118 | 73 | 101 | 105 |
| Oct | 248 | 300 | 345 | 290 | 249 | 240 | 291 | 228 | 315 | 255 | 276 |
| Nov | 446 | 421 | 392 | 429 | 397 | 424 | 472 | 461 | 420 | 401 | 426 |
| Dec | 733 | 620 | 643 | 515 | 569 | 589 | 750 | 582 | 545 | 665 | 621 |
| | 4,677 | 4,389 | 4,559 | 3,968 | 4,231 | 4,055 | 4,519 | 4,547 | 4,747 | 4,305 | 4,400 |
| | | | | | | | | | | | Standard Deviation 259 |

**APPENDIX C - 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 |
|------|-------|---------------|------------|-------------|------------------------|-------------------------|---------------------|---------------------|
| 2016 | Jul | 31 | 30 | 1.0 | 75,159 | | | |
| | Aug | 31 | 23 | 0.7 | 78,408 | | | |
| | Sep | 30 | 101 | 3.4 | 80,110 | | | |
| | Oct | 31 | 255 | 8.2 | 76,730 | 2.52 | 5.8 | 2,558 |
| | Nov | 30 | 401 | 13.4 | 81,958 | 4.07 | 10.8 | 2,644 |
| | Dec | 31 | 665 | 21.5 | 94,674 | 5.21 | 17.4 | 3,156 |
| 2017 | Jan | 31 | 712 | 23.0 | 106,122 | 5.40 | 22.2 | 3,423 |
| | Feb | 28 | 657 | 23.5 | 103,123 | 4.53 | 23.2 | 3,327 |
| | Mar | 31 | 690 | 22.3 | 92,002 | 3.11 | 22.9 | 3,286 |
| | Apr | 30 | 416 | 13.9 | 93,732 | 1.53 | 18.1 | 3,024 |
| | May | 31 | 264 | 8.5 | 76,526 | 0.00 | 11.2 | 2,551 |
| | Jun | 30 | 94 | 3.1 | 77,445 | | | |

**Linear regression results:
(Oct 2016 - May 2017)**

| | | | |
|----------|--------------|---------|-----------------------------------|
| HDD | Daylight hrs | b | |
| 46.66 | 48.43 | 2069.12 | coefficients |
| 5.38 | 18.61 | 86.31 | standard error coefficients |
| 0.96 | 82.34 | #N/A | R ² , standard error y |
| 65.09 | 5.00 | #N/A | F, degrees of freedom |
| 882547.5 | 33896.22 | #N/A | Regression SS, residual SS |
| 8.67 | 2.60 | 23.97 | t values |

APPENDIX C - SCHEDULE 3**Calculation of Forecast Marginal Net Revenue Rate for 2018**

| Rate Class | 2018 (Forecast) | | Unit Revenue (\$/MWh) |
|---------------------------|---------------------------|----------------|--------------------------|
| | Revenue (\$) | Sales (MWh) | |
| Residential | 76,393,871 | 558,577 | * |
| General Service | 59,994,151 | 390,780 | * |
| Small Industrial | 14,151,881 | 103,418 | |
| Total | 150,539,902 | 1,052,775 | \$ 142.99 |
| ECAM Base Rate (Proposed) | | | <u>\$ (91.61)</u> |
| | Marginal Net Revenue Rate | | <u>\$ 51.38</u> |

* Excludes revenue and kWh sales from seasonal customers

**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 | <u>12,753,746</u> | <u>91,596</u> | |
| Total | 160,092,260 | 1,097,052 | \$ 145.93 |
| ECAM Base Rate | | | <u>\$ (91.61)</u> |
| | Marginal Net Revenue Rate | | <u>\$ 54.32</u> |

* 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 | | Marginal Net Revenue (\$/MWh) | Weather Normalization Reserve | |
| | Actual HDD | 10 Year Average Monthly HDD | Variation from 10 Year Average HDD | Coefficient (MWh/HDD) | Variation from Average (MWh) | | 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 | |