

January 31, 2019

The Board of Commissioners of Public Utilities
Prince Charles Building
120 Torbay Road, P.O. Box 21040
St. John's, NL A1A 5B2

Attention: Ms. Cheryl Blundon
Director Corporate Services & Board Secretary

Dear Ms. Blundon:

**Re: Newfoundland and Labrador Hydro - the Board's Investigation and Hearing into
Supply Issues and Power Outages on the Island Interconnected System – Accuracy of
Nostradamus Load Forecasting – January 2019**

Hydro has historically filed semi-annual reports on the Nostradamus load forecasting tool in mid-November and mid-May. On January 18, 2018 the Board modified the filing schedule for submission of an annual report, to be filed on November 15th each year. On November 6, 2018, the Board accepted Hydro's request to change the annual filing date of the Nostradamus report each year from November 15th to January 31st, enabling Hydro to provide an annual report based on a calendar year. For this first annual report, the analysis encompasses data from the period of November 2017 to the end of December 2018.

Please find enclosed the original and twelve (12) copies of Hydro's report entitled *Accuracy of Nostradamus Load Forecasting at Newfoundland and Labrador Hydro – 2018 Annual Report*.

We trust the foregoing is satisfactory. If you have any questions or comments, please contact the undersigned.

Yours truly,

NEWFOUNDLAND AND LABRADOR HYDRO



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Senior Legal Counsel – Regulatory
SAW/kd

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Paul Coxworthy – Stewart McKelvey
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Accuracy of Nostradamus Load Forecasting at Newfoundland and
Labrador Hydro – 2018 Annual Report

January 31, 2019

A Report to the Board of Commissioners of Public Utilities



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1 **1 Nostradamus Load Forecasting**

2 **1.1 Nostradamus**

3 Newfoundland and Labrador Hydro (“Hydro”) uses software called Nostradamus¹, for short-
4 term load forecasting with a time frame of seven days. *The Nostradamus Neural Network*
5 *Forecasting system is a flexible neural network based forecasting tool developed specifically for*
6 *utility demand forecasting. Unlike conventional computing processes, which are programmed,*
7 *neural networks use sophisticated mathematical techniques to train a network of inputs and*
8 *outputs. Neural networks recognize and learn the joint relationships (linear or non-linear)*
9 *between the ranges of variables considered. Once the network learns these intricate*
10 *relationships, this knowledge can then easily be extended to produce accurate forecasts.*²

11

12 The Nostradamus model is trained using a sequence of continuous historic periods of hourly
13 weather and demand data, then forecasts system demand using predictions of those same
14 weather parameters for the next seven days.

15

16 **1.2 Short-Term Load Forecasting**

17 Hydro uses its short-term load forecast to manage the power system and ensure adequate
18 generating resources are available to meet customer demand.

19

20 **1.2.1 Utility Load**

21 Hydro has a contract with Wood PLC³ (“Wood”) to provide the weather parameters in the form
22 of hourly weather forecasts that are provided twice daily for the following seven days. At the
23 same time as the weather forecast data are provided, Wood also provides recent observed data
24 at the same locations as used in the forecasts.⁴ The actuals and forecast data are automatically
25 retrieved from Wood and input to the Nostradamus database.

¹ The product is provided by Ventyx, an ABB Company.

² Nostradamus User Guide.

³ Formerly Amec Foster Wheeler.

⁴ St. John’s, Gander, and Deer Lake.

1 Nostradamus can use a variety of weather parameters for forecasting as long as a historical
2 record is available for training. Hydro currently uses air temperature, wind speed, and cloud
3 cover. Nostradamus can use each variable more than once, for example both the current and
4 forecast air temperatures are used in forecasting load. Wind chill is not used explicitly as the
5 neural network function of Nostradamus will form its own relationships between load, wind,
6 and temperature.

7

8 Weather data for St. John’s, Gander, and Deer Lake are used in Nostradamus, as well as a
9 parameter that indicates daily daylight hours. Data from July 1, 2014 to June 30, 2018 are being
10 used for training and verification purposes. The training and verification periods are selected to
11 provide a sufficiently long period to ensure that a range of weather parameters are included
12 (e.g., high and low temperatures), but short enough that the historic load is still representative
13 of loads that can be expected in the future.

14

15 Demand data for the Avalon Peninsula alone and for the Island Interconnected System (“IIS”) as
16 a whole are automatically input to Nostradamus each hour. Only Newfoundland Power and
17 Hydro’s total utility load (conforming) is input in the Nostradamus model. Industrial load (non-
18 conforming), which is not a function of weather, is forecast outside of the Nostradamus
19 program and added to the forecasts provided by Nostradamus to derive the total load forecast.

20

21 During the process of training, the Nostradamus model creates separate sub-models for
22 weekdays, weekends, and holidays to account for the variation in customer use of electricity.
23 Nostradamus has separate holiday groups for statutory holidays and also for days that are
24 known to have unusual loads, for instance, the days between Christmas Day and New Year’s
25 Day, and the school Easter Break.⁵

⁵ Training the Nostradamus model is a process that is performed on an approximately annual basis. The goal is to improve the forecasting accuracy by providing Nostradamus with updated data and trends of recent loads and weather data. This helps ensure that variables such as load growth and extreme weather are properly taken into account when predicting future load requirements. Past experience indicates that Nostradamus is better at predicting loads based on load and weather ranges that it was trained for.

1 **1.2.2 Industrial Load**

2 Industrial load tends to be almost constant, as industrial processes are independent of weather.
3 Under the current procedure, the power-on-order for each Industrial Customer, plus the
4 expected owned generation from Corner Brook Pulp and Paper (“CBPP”), are used as the
5 industrial load forecasts unless the forecast is modified based on some knowledge of customer
6 loads, for instance a decrease due to reduced production at CBPP or a ramp up in the load
7 expected at Vale. Engineers can change the expected load in one or more cells of a seven by
8 twenty-four hour grid, or can change the default value to be used indefinitely.⁶
9

10 **1.2.3 Supply and Demand Status Reporting**

11 Since December 2014, Hydro has submitted periodic reports on the accuracy of Nostradamus
12 load forecasting in relation to the Board of Commissioners of Public Utilities (“Board”)
13 Investigation and Hearing into Supply Issues and Power Outages on the IIS. Directions from the
14 Board on January 18, 2018 indicated that the reporting frequency should change to annually
15 commencing in November 2018.⁷
16

17 The forecast peak as of 7:20 am is reported to the Board in the daily Supply and Demand Status
18 Report. The weather forecast for the following seven days and the observed weather data for
19 the previous day are input at approximately 5:00 am. Nostradamus is then run every hour of
20 the day and the most recent forecast is available for reference in monitoring and managing the
21 available and spinning reserves. The within-day forecast updates are primarily used to manage
22 spinning reserve, in particular in advance of the forecast system peaks.

⁶ In Hydro’s Energy Management System, there is functionality to modify the industrial load value when the Newfoundland and Labrador System Operator is aware of circumstances where an industrial customer will be reducing load. For example, if an industrial customer is completing maintenance, their forecasted load can be modified to provide a more accurate load forecast.

⁷ On November 6, 2018 the Board accepted Hydro’s request to change the annual filing date of this report to January 31st, which allows the report to cover the previous calendar year.

1 **1.3 Potential Sources of Variance**

2 As with any forecasting analysis, there will be discrepancies between the forecasted and actual
3 values. Typical sources of variance in the load forecasting are as follows:

- 4 • Differences in the industrial load forecast due to unexpected changes in industrial
5 customer loads. For example, if an industrial customer were to undergo maintenance or
6 increase production to meet customer demand, their actual load would deviate from
7 the scheduled load;
- 8 • Inaccuracies in the weather forecast, particularly temperature, wind speed, or cloud
9 cover; and
- 10 • Non-uniform customer behaviour, which results in unpredictability.

11

12 **2 Forecast Accuracy Summary**

13 **2.1 Analysis**

14 This report examines the accuracy of the Hydro forecasting process for November 2017 through
15 December 2018. All Tables and Figures in support of the report are contained in Appendix A.
16 Table 1 presents the daily forecast peak, the observed peak, and the available system capacity,
17 as included in Hydro’s daily Supply and Demand Status Reports submitted to the Board. The
18 data are also presented in Figure 1(a&b).

19

20 The total peak load during the period varied between 668 MW (August 18, 2018) and 1641 MW
21 (December 27, 2017). The available generation varied from 1010 MW to 2140 MW; IIS reserves
22 were sufficient throughout the period.

23

24 Table 2 presents error statistics for the total peak forecasts for the forecast period. Figure
25 2(a&b) is a plot of the forecast and actual peaks, as shown in Figure 1, but with the addition of a
26 bar chart showing the difference between the two data series, in MW. In both the tables and
27 the figures, a positive error is an overestimate; a negative error is an underestimate.

1 Figure 2 reveals that the forecasting process consistently overestimates the peak of the total
2 load. This is typically a result of an overestimate in the industrial load forecast; often CBPP.
3
4 Table 3 presents error statistics for the peak utility forecast, i.e. the portion of the forecast
5 actually determined by the Nostradamus model. The industrial forecast is not included in the
6 values of this table. Figure 3 plots the data and error for the utility peak. Examination of the
7 utility forecast focuses more clearly on the accuracy of Nostradamus; error in the industrial
8 forecast introduces error to the total forecast, making the total forecast look worse, or at times
9 better, than it is.

10

11 **2.2 Data Adjustments and Forecast Issues**

12 In analysing the data there are instances that require adjustments. In these instances, the data
13 for affected hours is replaced using interpolation so that in future when the data for this period
14 is used in training, Nostradamus will use a value not affected by the event.

15

16 On December 27, 2017 Newfoundland Power requested a short-term voltage reduction in order
17 to reduce the peak. Therefore the actual Avalon and Island utility load values in Nostradamus
18 were increased during these hours by 10 and 20 MW, respectively (estimated from the
19 observed decrease in the load when the voltage reduction was put in place).

20

21 On January 11, 2018 an under frequency load shedding (“UFLS”) event occurred. This resulted
22 in the recording of a lower data point for actual Avalon and Island utility load in that hour than
23 the load that would have occurred had the UFLS event not occurred.

24

25 On May 22, 2018 during late morning a UFLS event occurred due to a system event that
26 resulted in islanding (separation) of the West Coast system, reducing load on Hydro’s system.

27

28 On June 3, 2018 erroneous data was recorded for the Avalon utility load. The exact cause is
29 unknown; however, was most likely due to a loss of communications. The erroneous data was

1 replaced with the last accurate forecast value generated at 10:20 am so that in the future,
2 when the data during this period is used in training, Nostradamus will use a value that is not
3 affected by the erroneous data.

4

5 **2.3 Days of High Error**

6 The shaded dates in Tables 2 and 3 indicate that the days of high error in the load forecast. The
7 days with the highest error (up to three days per month) are selected for more detailed
8 analysis, which includes the days of:

- 9 • November 7, 11 and 25, 2017;
- 10 • December 2, 11 and 24, 2017;
- 11 • January 13, 27 and 28, 2018;
- 12 • February 11, 13 and 20, 2018;
- 13 • March 23 and 30, 2018;
- 14 • April 2, 21 and 22, 2018;
- 15 • May 6, 16 and 19, 2018;
- 16 • June 10, 16 and 27, 2018;
- 17 • July 2, 5 and 11, 2018;
- 18 • August 9, 17 and 21, 2018;
- 19 • September 3, 7 and 8, 2018;
- 20 • October 5, 30 and 31, 2018;
- 21 • November 6, 7 and 8, 2018; and
- 22 • December 7, 8 and 18, 2018.

23

24 **2.3.1 November 7, 2017**

25 On November 7, 2017, the 7:20 am peak forecast, as reported to the Board, was 1125 MW; the
26 actual reported peak was 976 MW. The absolute difference was 149 MW, 15.3% of the actual
27 peak. Figure 4 includes an hourly plot of the load forecast for November 7, 2017 as well as
28 actual load to assist in determining the sources of the differences between actual and forecast
29 loads.

1 Figure 4(a) shows the hourly distribution of the load forecast compared to the actual load. The
2 hourly forecast predicted a 7:00 pm peak of 1123 MW; the actual peak was 964 MW and it
3 occurred earlier at 6:00 pm.⁸

4

5 Figure 4(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
6 with the industrial component removed. The error in the forecast utility load was lower than
7 the error in the total load suggesting that part of the forecast overestimation was due to
8 industrial load.

9

10 Figure 4(c) shows the actual temperature in St. John's compared to the forecast. For most of
11 the day the temperature was 2°C warmer than forecast. It is likely that the error in the
12 temperature forecast contributed to the error in the load forecast.

13

14 Figure 4(d) shows the actual wind speed in St. John's compared to the forecast. For most of the
15 day the actual wind speed was lower than forecast, which likely contributed to lower load than
16 forecast at peak. Figure 4(e) shows the actual cloud cover in St. John's compared to the
17 forecast; the forecast was accurate at peak.

18

19 The discrepancy between actual and forecast load for November 7, 2017 was likely a result of
20 multiple factors including industrial load and errors in the temperature and wind speed
21 forecast. An overestimate of the load results in more than enough reserve being available. The
22 forecast remained poor throughout the day.

23

24 **2.3.2 November 11, 2017**

25 On November 11, 2017, the 7:20 am peak forecast, as reported to the Board, was 1135 MW;
26 the actual reported peak was 1251 MW. The absolute difference was 116 MW, 9.2% of the

⁸ The reason for slightly different peaks between the daily Supply and Demand Report and the Nostradamus data is a result of the sampling resolution. The Supply and Demand Report uses a five minute interval for sampling, whereas Nostradamus uses an hourly interval for both its forecasted and actual values. This sampling resolution difference can be seen throughout the Days of High Error analysis.

1 actual peak. Figure 5 includes an hourly plot of the load forecast for November 11, 2017 as well
2 as actual load to assist in determining the sources of the differences between actual and
3 forecast loads.

4
5 Figure 5(a) shows the hourly distribution of the load forecast compared to the actual load. The
6 hourly forecast predicted a 9:00 pm peak of 1133 MW; the actual peak was 1233 MW and it
7 occurred earlier at 5:00 pm.

8
9 Figure 5(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
10 with the industrial component removed. The error in the forecast utility load was higher than
11 the error in the total load.

12
13 Figures 5(c), 5(d) and 5(e) show comparisons of the temperature, wind and cloud cover
14 forecasts with observed conditions. Both the temperature and wind speed forecasts were
15 accurate for most of the day but it was up to 2°C colder than forecast for most of the afternoon,
16 which likely contributed to the forecast error. The cloud cover estimate was less accurate and
17 may have contributed to the forecast error. The temperature trend was unusual on November
18 11, 2017 in that the temperature stayed fairly constant from approximately 9 am through to
19 the end of the day, rather than increasing through the morning and decreasing later in the day.

20
21 Another potential contributor to the forecast error was the fact that November 11 is a statutory
22 holiday and occurred on a weekend. Nostradamus inputs include information on past and
23 future holidays, but in training the forecast, Nostradamus has fewer holidays and weekends on
24 which to base its algorithms.

25
26 The discrepancy between actual and forecast load for November 11, 2017 was likely a result of
27 multiple factors including errors in the temperature and cloud cover, an unusual temperature
28 trend and difficult to predict customer behaviour on the weekend statutory holiday. The
29 forecast improved somewhat through the day and by the time of the peak the forecast was

1 within 3% of the actual. Energy Control Centre operators were aware of the error and
2 responded accordingly to maintain sufficient reserves throughout the peak period.

3

4 **2.3.3 November 25, 2017**

5 On November 25, 2017, the 7:20 am peak forecast, as reported to the Board, was 1255 MW;
6 the actual reported peak was 1172 MW. The absolute difference was 83 MW, 7.1% of the
7 actual peak. Figure 6 includes an hourly plot of the load forecast for November 25, 2017 as well
8 as actual load to assist in determining the sources of the differences between actual and
9 forecast loads.

10

11 Figure 6(a) shows the hourly distribution of the load forecast compared to the actual load. The
12 hourly forecast predicted a 6:00 pm peak of 1253 MW; the actual peak was 1172 MW at
13 5:00 pm.

14

15 Figure 6(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
16 with the industrial component removed. The forecast utility load was marginally closer to the
17 actual utility load than the total forecast load was to the actual total load.

18

19 Figure 6(c) shows the actual temperature in St. John's compared to the forecast. At the time of
20 the peak the temperature was lower than forecast but for most of the day the temperature was
21 greater than forecast. It is likely that the error in the temperature forecast contributed to the
22 error in the load forecast.

23

24 Figure 6(d) shows the actual wind speed in St. John's compared to the forecast. For most of the
25 day the actual wind speed was lower than forecast, which likely resulted in lower load than
26 forecast. Figure 6(e) shows the actual cloud cover in St. John's compared to the forecast; the
27 forecast was poor for most of the day.

1 The discrepancy between actual and forecast load for November 25, 2017 was likely a result of
2 errors in the weather forecast. An overestimate of the load results in more than enough reserve
3 being available. The forecast improved as the day went on and was close to actual by mid-
4 afternoon.

5

6 **2.3.4 December 2, 2017**

7 On December 2, 2017, the 7:20 am peak forecast, as reported to the Board, was 1340 MW; the
8 actual reported peak was 1248 MW. The absolute difference was 92 MW, 7.4% of the actual
9 peak. Figure 7 includes an hourly plot of the load forecast for December 2, 2017 as well as
10 actual load to assist in determining the sources of the differences between actual and forecast
11 loads.

12

13 Figure 7(a) shows the hourly distribution of the load forecast compared to the actual load. The
14 hourly forecast predicted a 5:00 pm peak of 1338 MW; the actual peak was 1248 MW.

15

16 Figure 7(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
17 with the industrial component removed. The forecast utility load was closer to the actual utility
18 load than the forecast total load was to the actual total load suggesting the forecast
19 overestimation was due in part to industrial load.

20

21 Figure 7(c) shows the actual temperature in St. John's compared to the forecast. The actual
22 temperature was lower than forecast for the entire day by approximately 1°C. This small
23 variation would not likely have an effect on the load forecast overestimate.

24

25 Figure 7(d) shows the actual wind speed in St. John's compared to the forecast. For the entire
26 day the actual wind speed was lower than forecast, which likely resulted in lower load than
27 forecast. Figure 7(e) shows the actual cloud cover in St. John's compared to the forecast; the
28 forecast was accurate until 1:00 pm where the cloud cover was less than forecast. This could
29 also have contributed to the overestimation of load at peak.

1 The discrepancy between actual and forecast load for December 2, 2017 was likely a result of
2 industrial load and errors in the wind and cloud cover forecast. An overestimate of the load
3 results in more than enough reserve being available. The forecast improved as the day went on.
4

5 **2.3.5 December 11, 2017**

6 On December 11, the 7:20 am peak forecast, as reported to the Board, was 1390 MW; the
7 actual reported peak was 1228 MW. The absolute difference was 162 MW, 13.2% of the actual
8 peak. Figure 8 includes an hourly plot of the load forecast for December 11, 2017 as well as
9 several charts to assist in determining the sources of the differences between actual and
10 forecast loads.
11

12 Figure 8(a) shows the hourly distribution of the load forecast compared to the actual load. The
13 hourly forecast predicted a 5:00 pm peak of 1388 MW; the actual peak was 1226 MW.
14

15 Figure 8(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
16 with the industrial component removed. The error in the forecast of the utility load was lower
17 than the error in the forecast of total load, meaning that error in the industrial load contributed
18 to the error in the total load forecast.
19

20 Figure 8(c) shows the actual temperature in St. John's compared to the forecast. The actual
21 temperature was approximately 2°C lower than forecast until noon where it remained 1°C
22 below forecast until 9:00 pm. It is likely that the error in the temperature forecast contributed
23 to the error in the load forecast.
24

25 Figure 8(d) shows the actual wind speed in St. John's compared to the forecast. For the entire
26 day the actual wind speed was relatively accurate. Figure 8(e) shows the actual cloud cover in
27 St. John's compared to the forecast; the forecast was overestimated at peak. This could have
28 contributed to the overestimation of load at peak.

1 The discrepancy between actual and forecast load for December 11, 2017 was likely a result of
2 industrial load and errors in the weather forecast. An overestimate of the load results in more
3 than enough reserve being available. The forecast did not improve as the day went on.
4

5 **2.3.6 December 24, 2017**

6 On December 24, the 7:20 am peak forecast, as reported to the Board, was 1445 MW; the
7 actual reported peak was 1292 MW. The absolute difference was 153 MW, 11.9% of the actual
8 peak. Figure 9 includes an hourly plot of the load forecast for December 24, 2017 as well as
9 several charts to assist in determining the sources of the differences between actual and
10 forecast loads.
11

12 Figure 9(a) shows the hourly distribution of the load forecast compared to the actual load. The
13 hourly forecast predicted a 5:00 pm peak of 1444 MW; the actual peak was 1292 MW.
14

15 Figure 9(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
16 with the industrial component removed. The error in the forecast of the utility load was 22 MW
17 lower than the error in the forecast of total load.
18

19 Figures 9(c) and 9(d) show the actual temperature and wind in St. John's compared to the
20 forecast. Both were relatively accurate. The midday temperature was approximately 2°C above
21 forecast.
22

23 Figure 9(e) shows the actual cloud cover in St. John's compared to the forecast. For all of the
24 afternoon the day was clear rather than being fully overcast, which likely contributed to the
25 overestimation in the load forecast.
26

27 Another potentially contributing factor to the forecast error was that it was Christmas Eve and a
28 weekend day. As noted earlier, Nostradamus has fewer holidays and weekends in its training
29 period from which to create the algorithm used in load prediction.

1 The discrepancy between actual and forecast load for December 24, 2017 was likely a result of
2 multiple factors including errors in the cloud cover, and difficult to predict customer behaviour
3 on Christmas Eve falling on a weekend. An overestimate of the load results in more than
4 enough reserve being available.

5

6 **2.3.7 January 13, 2018**

7 On January 13, 2018, the 7:20 am peak forecast, as reported to the Board, was 1215 MW; the
8 actual reported peak was 1064 MW. The absolute difference was 151 MW, 14.2% of the actual
9 peak. Figure 10 includes an hourly plot of the load forecast for January 13, 2018 as well as
10 actual load chart to assist in determining the sources of the differences between actual and
11 forecast loads.

12

13 Figure 10(a) shows the hourly distribution of the load forecast compared to the actual load. The
14 hourly forecast predicted a 5:00 pm peak of 1216 MW; the actual peak was 1063 MW.

15

16 Figure 10(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
17 with the industrial component removed. The forecast utility load was closer to the actual utility
18 load; the forecast peak was 1028 MW, the actual was 918 MW. This means that error in the
19 industrial load forecast contributed to the error in the total forecast.

20

21 Figure 10(c) shows a comparison between the forecast and actual temperatures for January 13,
22 2018. Both the trend and the temperatures themselves were unusual in both the forecast and
23 actual. The temperature forecast called for 8°C at midnight, warming through the morning and
24 then 11°C all afternoon and evening. The actual temperatures followed the forecast shape but
25 were higher still, reaching above 14°C by mid evening. The wind and cloud cover forecasts were
26 reasonably accurate, as shown in Figures 10(d) and 10(e).

1 The discrepancy between actual and forecast load for January 13, 2018 was a result of error in
2 the temperature forecast, combined with the unusually high temperatures on that day. This
3 likely contributed to the forecast error. The forecast remained poor throughout the day.
4

5 **2.3.8 January 27, 2018**

6 On January 27, 2018, the 7:20 am peak forecast, as reported to the Board, was 1665 MW; the
7 actual reported peak was 1471 MW. The absolute difference was 194 MW, 13.2% of the actual
8 peak. Figure 11 includes an hourly plot of the load forecast for January 27, 2018 as well as
9 several plots to assist in determining the sources of the differences between actual and forecast
10 loads.
11

12 Figure 11(a) shows the hourly distribution of the load forecast compared to the actual load. The
13 hourly forecast predicted a 5:00 pm peak of 1666 MW; the actual peak was 1467 MW and was
14 at 6:00 pm.
15

16 Figure 11(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
17 with the industrial component removed. The error in the forecast of the utility load was almost
18 as high as the error in the forecast of total load.
19

20 Figure 11(c) shows the actual temperature in St. John's compared to the forecast. The forecast
21 was for temperatures to drop through the early morning but then stay low at -10°C throughout
22 the day. The temperatures were fairly consistent through the day but were closer to -8°C or -
23 9°C, resulting in lower load than forecast.
24

25 Figure 11(d) shows the actual wind speed in St. John's compared to the forecast. Again the
26 forecast was poor for most of the day and that error would have contributed to a lower load
27 than forecast. Figure 11(e) shows the actual cloud cover in St. John's compared to the forecast;
28 it was also poor for most of the day.

1 The discrepancy between actual and forecast load January 27, 2018 was a result of poor
2 weather forecasting and persisted through the day. An overestimation of the load results in
3 more than enough reserve being available.
4

5 **2.3.9 January 28, 2018**

6 On January 28, 2018, the 7:20 am peak forecast, as reported to the Board, was 1470 MW; the
7 actual reported peak was 1323 MW. The absolute difference was 147 MW, 11.1% of the actual
8 peak. Figure 12 includes an hourly plot of the load forecast for January 28, 2018 as well as
9 actual load chart to assist in determining the sources of the differences between actual and
10 forecast loads.
11

12 Figure 12(a) shows the hourly distribution of the load forecast compared to the actual load.
13 The hourly forecast predicted a 12:00 pm peak of 1471 MW; the actual peak was 1321 MW and
14 occurred at 11:00 am.
15

16 Figure 12(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
17 with the industrial component removed. The error in the forecast of the utility load was lower
18 than the error in the forecast of total load, meaning that error in the industrial load contributed
19 to the error in the total load forecast.
20

21 Figure 12(c) shows the actual temperature in St. John's compared to the forecast. The
22 temperature forecast was underestimated until noon when the forecast aligned with the actual
23 for the remainder of the day. This trend does not explain the overestimation of load forecast at
24 peak.
25

26 Figure 12(d) shows the actual wind speed in St. John's compared to the forecast. For the entire
27 day the actual wind speed was relatively accurate compared to the forecast. Figure 12(e) shows
28 the actual cloud cover in St. John's compared to the forecast. The forecast was accurate during
29 daylight hours.

1 The discrepancy between actual and forecast load January 28, 2018 was primarily a result of
2 error in industrial load contributing to error in the total load forecast. An overestimation of the
3 load results in more than enough reserve being available. The forecast did not improve as the
4 day went on.

5

6 **2.3.10 February 11, 2018**

7 On February 11, 2018, the 7:20 am peak forecast, as reported to the Board, was 1420 MW; the
8 actual reported peak was 1309 MW. The absolute difference was 111 MW, 8.4% of the actual
9 peak. Figure 13 includes an hourly plot of the load forecast for February 11, 2018 as well as
10 actual load chart to assist in determining the sources of the differences between actual and
11 forecast loads.

12

13 Figure 13(a) shows the hourly distribution of the load forecast compared to the actual load. The
14 hourly forecast predicted a 6:00 pm peak of 1419 MW; the actual peak was 1308 MW.

15

16 Figure 13(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
17 with the industrial component removed. The forecast utility load was somewhat closer to the
18 actual utility load but still poor.

19

20 Figure 13(c) shows the actual temperature in St. John's compared to the forecast. The forecast
21 underestimated the temperature for most of the day, which would have resulted in load being
22 lower than forecast.

23

24 Figure 13(d) shows the actual wind speed in St. John's compared to the forecast. The forecast
25 was for higher winds than occurred, which likely contributed to the forecast error. Figure 13(e)
26 shows the actual cloud cover in St. John's compared to the forecast; it was fairly accurate for
27 most of the day.

1 The discrepancy between actual and forecast load for February 11, 2018 was primarily a result
2 of weather forecast error. The forecast remained poor all day. An overestimate of the load
3 results in more than enough reserve being available.
4

5 **2.3.11 February 13, 2018**

6 On February 13, 2018, the 7:20 am peak forecast, as reported to the Board, was 1685 MW; the
7 actual reported peak was 1512 MW. The absolute difference was 173 MW, 11.4% of the actual
8 peak. Figure 14 includes an hourly plot of the load forecast for February 13, 2018 as well as
9 several plots to assist in determining the sources of the differences between actual and forecast
10 loads.
11

12 Figure 14(a) shows the hourly distribution of the load forecast compared to the actual load. The
13 hourly forecast predicted a 6:00 pm peak of 1668 MW; the actual peak was 1504 MW.
14

15 Figure 14(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
16 with the industrial component removed. The error in the forecast of the utility load was lower
17 than the error in the forecast of total load, meaning that error in the industrial load contributed
18 to the error in the total load forecast.
19

20 Figure 14(c) shows the actual temperature in St. John's compared to the forecast. The
21 temperature forecast was overestimated by approximately 2°C until 10:00 am where the
22 forecast remained underestimated by approximately 4°C for the remainder of the day. This
23 likely contributed to load being lower than forecast at peak.
24

25 Figure 14(d) shows the actual wind speed in St. John's compared to the forecast. The wind
26 speed forecast was underestimated until 10:00 am where the forecast remained overestimated
27 for the remainder of the day. This likely contributed to the load forecast error at peak. Figure
28 14(e) shows the actual cloud cover in St. John's compared to the forecast. The forecast followed
29 the same trend as the temperature forecast; overestimated until 10:00 am where it remained

1 underestimated for the remainder of the day. An underestimation of cloud cover does not
2 suggest a contribution to the overestimation of load.

3

4 The discrepancy between actual and forecast load for February 13, 2018 was primarily a result
5 of industrial load error and error in the temperature and wind forecast. The forecast remained
6 poor for the rest of the day. An overestimation of the load results in more than enough reserve
7 being available.

8

9 **2.3.12 February 20, 2018**

10 On February 20, 2018, the 7:20 am peak forecast, as reported to the Board, was 1540 MW; the
11 actual reported peak was 1396 MW. The absolute difference was 144 MW, 10.3% of the actual
12 peak. Figure 15 includes an hourly plot of the load forecast for February 20 as well as several
13 plots to assist in determining the sources of the differences between actual and forecast loads.

14

15 Figure 15(a) shows the hourly distribution of the load forecast compared to the actual load. The
16 hourly forecast predicted a 5:00 pm peak of 1538 MW; the actual peak was 1395 MW and
17 occurred at 8:00 am. At that time the total load forecast was 1421 MW; resulting in an
18 overestimate of only 1.8%.

19

20 Figure 15(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
21 with the industrial component removed. The error in the forecast of the utility load was slightly
22 lower than the error in the forecast of total load.

23

24 Figure 15(c) shows the actual temperature in St. John's compared to the forecast. The forecast
25 was accurate for the morning, but for the afternoon and evening, the actual temperature was
26 3°C higher than forecast. This likely contributed to the load never experiencing the second,
27 higher, peak shown in the forecast.

1 Figure 15(d) shows the actual wind speed in St. John’s compared to the forecast. The wind
2 forecast was poor for entire day, calling for much higher winds than actual. Error in the wind
3 speed forecast likely contributed to the error in the load forecast. Figure 15(e) shows the actual
4 cloud cover in St. John’s compared to the forecast. The cloud cover was also overestimated in
5 the late afternoon and early evening. Given the late time of day, it would have been dark by the
6 time of the greatest error so this likely did not contribute to forecast error.

7
8 The discrepancy between actual and forecast load for February 20, 2018 was primarily a result
9 of poor weather forecasting. The load forecast did not improve through the day. An
10 overestimate of the load results in more than enough reserve being available.

11
12 **2.3.13 March 23, 2018**

13 On March 23, 2018 the 7:20 am peak forecast, as reported to the Board, was 1285 MW; the
14 actual reported peak was 1213 MW. The absolute difference was 72 MW, 5.9% of the actual
15 peak. Figure 16 includes an hourly plot of the load forecast for March 23, 2018 as well as actual
16 load chart to assist in determining the sources of the differences between actual and forecast
17 loads.

18
19 Figure 16(a) shows the hourly distribution of the load forecast compared to the actual load. The
20 hourly forecast predicted an 8:00 am peak of 1287 MW; the actual peak was 1209 MW.

21
22 Figure 16(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
23 with the industrial component removed. The error in the forecast of the utility load was
24 negligible. This suggests the error in the industrial load do not significantly contribute to the
25 error in the total load forecast.

26
27 Figure 16(c) shows the actual temperature in St. John’s compared to the forecast. The
28 temperature forecast was overestimated until 10:00 am where the forecast remained

1 underestimated for the remainder of the day. At noon the actual temperature was 5 degrees
2 warmer than forecast.

3

4 Figure 16(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
5 wind speed was overestimated until 11:00 am where the forecast remained relatively accurate
6 for the remainder of the day. Figure 16(e) shows the actual cloud cover in St. John’s compared
7 to the forecast. The forecast was overestimated for most of the daylight hours.

8

9 The discrepancy between actual and forecast load for March 23, 2018 was primarily a result of
10 error in industrial load. The load forecast improved throughout the day. An overestimate of the
11 load results in more than enough reserve being available.

12

13 **2.3.14 March 30, 2018**

14 On March 30, 2018 the 7:20 am peak forecast, as reported to the Board, was 1275 MW; the
15 actual reported peak was 1192 MW. The absolute difference was 83 MW, 7.0% of the actual
16 peak. Figure 17 includes an hourly plot of the load forecast for March 30, 2018 as well as actual
17 load chart to assist in determining the sources of the differences between actual and forecast
18 loads.

19

20 Figure 17(a) shows the hourly distribution of the load forecast compared to the actual load.
21 The hourly forecast predicted an 11:00 am peak of 1274 MW; the actual peak was 1192 MW
22 and it occurred earlier at 10:00 am.

23

24 Figure 17(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
25 with the industrial component removed. The error in the forecast of the utility load was nearly
26 as high as the error in the forecast of total load.

27

28 Figure 17(c) shows the actual temperature in St. John’s compared to the forecast. For almost all
29 of the day the actual temperature was greater than forecast with a difference of up to 3°C in

1 the late afternoon. Warmer temperatures than forecast likely contributed to load forecast
2 error.

3
4 Figure 17(d) shows the actual wind speed in St. John’s compared to the forecast. The wind
5 forecast was relatively accurate for the day. Figure 17(e) shows the actual cloud cover in St.
6 John’s compared to the forecast; it too was relatively accurate for most of the day but generally
7 called for cloudier conditions than actually occurred.

8
9 The discrepancy between actual and forecast load for March 30, 2018 was primarily a result of
10 poor weather forecasting. An overestimate of the load results in more than enough reserve
11 being available. Updates did not improve the forecast through the day.

12

13 **2.3.15 April 2, 2018**

14 On April 2, 2018, the 7:20 am peak forecast, as reported to the Board, was 1270 MW; the actual
15 reported peak was 1187 MW. The absolute difference was 83 MW, 7.0% of the actual peak.
16 Figure 18 includes an hourly plot of the load forecast for April 2, 2018 as well as actual load
17 chart to assist in determining the sources of the differences between actual and forecast loads.

18
19 Figure 18(a) shows the hourly distribution of the load forecast compared to the actual load.
20 The hourly forecast predicted a 12:00 pm peak of 1268 MW; the actual peak was 1181 MW at
21 9:00 am.

22
23 Figure 18(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
24 with the industrial component removed. The error in the forecast of the utility load was
25 essentially the same as the error in the forecast of total load.

26
27 Figure 18(c) shows the actual temperature in St. John’s compared to the forecast. Warmer than
28 forecast temperatures, particularly during the mid-day hours, likely contributed to load forecast
29 error.

1 Figure 18(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
2 was relatively accurate for most of the day but did underestimate the wind speed in the mid to
3 late afternoon.

4
5 Figure 18(e) shows the actual cloud cover in St. John’s compared to the forecast; cloud cover
6 was overestimated for much of the first part of the day but underestimated for the late day and
7 evening.

8
9 It is likely the errors in the temperature forecast that resulted in the overestimated load
10 forecast. An overestimate of the load results in more than enough reserve being available.
11 Updates did not improve the forecast through the day.

12

13 **2.3.16 April 21, 2018**

14 On April 21, 2018, the 7:20 am peak forecast, as reported to the Board, was 1230 MW; the
15 actual reported peak was 1120 MW. The absolute difference was 110 MW, 9.8% of the actual
16 peak. Figure 19 includes an hourly plot of the load forecast for April 21, 2018 as well as actual
17 load chart to assist in determining the sources of the differences between actual and forecast
18 loads.

19

20 Figure 19(a) shows the hourly distribution of the load forecast compared to the actual load. The
21 hourly forecast predicted an 11:00 am peak of 1232 MW; the actual peak was 1115 MW and
22 occurred at 9:00 pm.

23

24 Figure 19(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
25 with the industrial component removed. The error in the forecast of the utility load was lower
26 than the error in the forecast of total load, meaning that error in the industrial load contributed
27 to the error in the total load forecast.

1 Figure 19(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was underestimated during daylight hours; however, was overestimated
3 at peak. This could have contributed to the load forecast error at peak.

4
5 Figure 19(d) shows the actual wind speed in St. John’s compared to the forecast. The actual
6 wind speed was relatively accurate for the entire day. Figure 19(e) shows the actual cloud cover
7 in St. John’s compared to the forecast. During daylight hours, the forecast was also relatively
8 accurate.

9
10 It is likely that errors in the industrial load and temperature forecast resulted in the
11 overestimation of the load forecast. An overestimation of the load results in more than enough
12 reserve being available. Updates improved the forecast throughout the day.

13

14 **2.3.17 April 22, 2018**

15 On April 22, 2018, the 7:20 am peak forecast, as reported to the Board, was 1235 MW; the
16 actual reported peak was 1117 MW. The absolute difference was 118 MW, 10.6% of the actual
17 peak. Figure 20 includes an hourly plot of the load forecast for April 22, 2018 as well as actual
18 load chart to assist in determining the sources of the differences between actual and forecast
19 loads.

20

21 Figure 20(a) shows the hourly distribution of the load forecast compared to the actual load.
22 The hourly forecast predicted a 12:00 pm peak of 1234 MW; the actual peak was 1116 MW and
23 occurred at 10:00 am.

24

25 Figure 20(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
26 with the industrial component removed. The error in the forecast of the utility load was almost
27 as high as the error in the forecast of total load.

1 Figure 20(c) shows the actual temperature in St. John’s compared to the forecast. Warmer than
2 forecast temperatures, particularly during the mid-day hours, likely contributed to load forecast
3 error.

4

5 Figure 20(d) shows the actual wind speed in St. John’s compared to the forecast. The actual
6 wind speed was also lower than forecast and may have contributed to the load forecast error.

7 Figure 20(e) shows the actual cloud cover in St. John’s compared to the forecast; cloud cover
8 was overestimated for much of the day.

9

10 It is likely that errors in the temperature forecast resulted in the overestimated load forecast.
11 An overestimate of the load results in more than enough reserve being available. Updates did
12 not improve the forecast through the day.

13

14 **2.3.18 May 6, 2018**

15 On May 6, 2018, the 7:20 am peak forecast, as reported to the Board, was 1050 MW; the actual
16 reported peak was 945 MW. The absolute difference was 105 MW, 11.1% of the actual peak.

17 Figure 21 includes an hourly plot of the load forecast for May 6, 2018 as well as several plots to
18 assist in determining the sources of the differences between actual and forecast loads.

19

20 Figure 21(a) shows the hourly distribution of the load forecast compared to the actual load. The
21 hourly forecast predicted a 10:00 am peak of 1048 MW; the actual peak was 938 MW.

22

23 Figure 21(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
24 with the industrial component removed. The error in the forecast of the utility load was similar
25 to the error in the forecast of total load.

26

27 Figure 21(c) shows the actual temperature in St. John’s compared to the forecast; the forecast
28 trend for the day was accurate but the temperatures was up to 3°C higher than forecast all day.

1 At the time of the peak the actual temperature was 2°C higher than forecast. Warmer than
2 forecast temperatures would have contributed to forecast error.

3
4 Figure 21(d) shows the actual wind speed in St. John’s compared to the forecast. It was
5 reasonably accurate for most of the day. At the time of the peak the wind speed was higher
6 than forecast, but that was insufficient to counteract the effect of the higher temperature.

7 Figure 21(e) shows the actual cloud cover in St. John’s compared to the forecast; cloud cover
8 was also overestimated for most of the day, which may have contributed to forecast error.

9
10 The discrepancy between actual and forecast load for May 6, 2018 was largely due to the
11 higher temperatures than forecast. The accuracy of the forecast improved as the day went by,
12 but not until after the peak had already occurred.

13

14 **2.3.19 May 16, 2018**

15 On May 16, 2018, the 7:20 am peak forecast, as reported to the Board, was 965 MW; the actual
16 reported peak was 894 MW. The absolute difference was 71 MW, 8.0% of the actual peak.

17 Figure 22 includes an hourly plot of the load forecast for May 16, 2018 as well as several plots
18 to assist in determining the sources of the differences between actual and forecast loads.

19

20 Figure 22(a) shows the hourly distribution of the load forecast compared to the actual load. The
21 hourly forecast predicted a 12:00 pm peak of 963 MW; the actual peak was 886 MW and
22 occurred at 10:00 pm.

23

24 Figure 22(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
25 with the industrial component removed. The error in the forecast of the utility load was lower
26 than the error in the forecast of total load, meaning that error in the industrial load contributed
27 to the error in the total load forecast.

1 Figure 22(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was underestimated at the beginning of the day; however, was
3 overestimated by approximately 1°C during the remainder of the day. This could have
4 contributed to the overestimation of load forecast at peak.

5
6 Figure 22(d) shows the actual wind speed in St. John’s compared to the forecast. The wind
7 speed forecast was overestimated until 5:00 pm, where it was underestimated for the
8 remainder of the day. Figure 22(e) shows the actual cloud cover in St. John’s compared to the
9 forecast. During daylight hours, the forecast was underestimated.

10

11 The discrepancy between actual and forecast load for May 16, 2018 was likely due to errors in
12 industrial load and temperature forecast. The accuracy of the forecast improved throughout
13 the day. An overestimation of the load results in more than enough reserve being available.

14

15 **2.3.20 May 19, 2018**

16 On May 19, 2018, the 7:20 am peak forecast, as reported to the Board, was 985 MW; the actual
17 reported peak was 891 MW. The absolute difference was 94 MW, 10.5% of the actual peak.

18 Figure 23 includes an hourly plot of the load forecast for May 19, 2018 as well as several plots
19 to assist in determining the sources of the differences between actual and forecast loads.

20

21 Figure 23(a) shows the hourly distribution of the load forecast compared to the actual load.

22 The hourly forecast predicted a 10:00 am peak of 987 MW; the actual peak was 883 MW and
23 occurred at 11:00 am.

24

25 Figure 23(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
26 with the industrial component removed. The error in the forecast of the utility load was lower
27 than the error in the forecast of total load, meaning that error in the industrial load contributed
28 to the error in the total load forecast.

1 Figure 23(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was underestimated for the majority of the day; including at peak. This
3 could have contributed to the overestimation of load forecast.

4

5 Figure 23(d) shows the actual wind speed in St. John’s compared to the forecast. The wind
6 speed forecast was overestimated for most of the day. This likely contributed to the
7 overestimation of load forecast as well. Figure 23(e) shows the actual cloud cover in St. John’s
8 compared to the forecast. During daylight hours, the forecast was mostly underestimated
9 compared to actual.

10

11 The discrepancy between actual and forecast load for May 19, 2018 was likely due to errors in
12 industrial load as well as temperature and wind speed forecast. The accuracy of the forecast
13 remained poor throughout the day. An overestimation of the load results in more than enough
14 reserve being available.

15

16 **2.3.21 June 10, 2018**

17 On June 10, 2018, the 7:20 am peak forecast, as reported to the Board, was 935 MW; the actual
18 reported peak was 872 MW. The absolute difference was 63 MW, 7.3% of the actual peak.

19 Figure 24 includes an hourly plot of the load forecast for June 10, 2018 as well as several plots
20 to assist in determining the sources of the differences between actual and forecast loads.

21

22 Figure 24(a) shows the hourly distribution of the load forecast compared to the actual load. The
23 hourly forecast predicted an 11:00 am peak of 937 MW; the actual peak was 872 MW and
24 occurred at 10:00 am.

25

26 Figure 24(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
27 with the industrial component removed. The error in the forecast of the utility load was similar
28 to the error in the forecast of total load, suggesting that industrial load did not contribute to
29 the error in the total load forecast.

1 Figure 24(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was underestimated for most of the day, including at peak. The higher
3 temperature than forecast likely contributed to the overestimation of forecast load at peak.

4
5 Figure 24(d) shows the actual wind speed in St. John’s compared to the forecast. The forecasted
6 wind speed was relatively accurate until 4:00 pm where it remained overestimated for the
7 remainder of the day. Figure 24(e) shows the actual cloud cover in St. John’s compared to the
8 forecast. During daylight hours, the forecast was overestimated compared to actual. This could
9 also have contributed to the overestimation of forecast load.

10
11 The discrepancy between actual and forecast load for June 10, 2018 was likely due to errors in
12 temperature and cloud cover forecast. The accuracy of the forecast improved throughout the
13 day; however, it remained poor at peak. An overestimation of the load results in more than
14 enough reserve being available.

15
16 **2.3.22 June 16, 2018**

17 On June 16, 2018, the 7:20 am peak forecast, as reported to the Board, was 935 MW; the actual
18 reported peak was 829 MW. The absolute difference was 106 MW, 12.8% of the actual peak.
19 Figure 25 includes an hourly plot of the load forecast for June 16 as well as several plots to
20 assist in determining the sources of the differences between actual and forecast loads.

21
22 Figure 25(a) shows the hourly distribution of the load forecast compared to the actual load. The
23 hourly forecast predicted a 10:00 am peak of 937 MW; the actual peak was 828 MW.

24
25 Figure 25(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
26 with the industrial component removed. The error in the forecast of the utility load was lower
27 than the error in the forecast of total load, meaning that error in the industrial load contributed
28 to the error in the total load forecast.

1 Figure 25(c) shows the actual temperature in St. John’s compared to the forecast. While the
2 forecast overestimated the temperature for the early morning, after 7:00 am the temperature
3 was significantly higher than forecast. At the time of the peak, the actual temperature was 6°C
4 higher than forecast. This would have contributed to forecast error.

5
6 Figure 25(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
7 over predicted the wind speed for the first half of the day, but both the forecast and actual
8 wind speed was low. Figure 25(e) shows the actual cloud cover in St. John’s compared to the
9 forecast. The cloud cover was also lower than predicted, which could have contributed to the
10 lower load than forecast.

11
12 The discrepancy between actual and forecast utility load for June 16, 2018 was likely due to the
13 error in the temperature forecast. The forecast improved through the day, but not until after
14 the peak had occurred at 10:00 am. An overestimate of the load results in more than enough
15 reserve being available.

16

17 **2.3.23 June 27, 2018**

18 On June 27, 2018, the 7:20 am peak forecast, as reported to the Board, was 1010 MW; the
19 actual reported peak was 953 MW. The absolute difference was 57 MW, 5.9% of the actual
20 peak. Figure 26 includes an hourly plot of the load forecast for June 27, 2018 as well as several
21 plots to assist in determining the sources of the differences between actual and forecast loads.

22

23 Figure 26(a) shows the hourly distribution of the load forecast compared to the actual load. The
24 hourly forecast predicted an 8:00 am peak of 1009 MW; the actual peak was 944 MW.

25

26 Figure 26(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
27 with the industrial component removed. The error in the forecast of the utility load was lower
28 than the error in the forecast of total load, meaning that error in the industrial load contributed
29 to the error in the total load forecast.

1 Figure 26(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was overestimated until 1:00 pm and was underestimated until 7:00 pm
3 where the temperature continued to trend lower than forecast for the remainder of the day.
4

5 Figure 26(d) shows the actual wind speed in St. John’s compared to the forecast. The wind
6 speed forecast was overestimated for the majority of the day. This could have contributed to
7 the overestimation of load forecast. Figure 26(e) shows the actual cloud cover in St. John’s
8 compared to the forecast. During daylight hours, the forecast was underestimated until 2:00
9 pm where it remained overestimated for the remainder of the day.
10

11 The discrepancy between actual and forecast utility load for June 27, 2018 was likely due to
12 error in the industrial load and temperature forecast. The forecast remained poor through the
13 day. An overestimate of the load results in more than enough reserve being available.
14

15 **2.3.24 July 2, 2018**

16 On July 2, 2018, the 7:20 am peak forecast, as reported to the Board, was 830 MW; the actual
17 reported peak was 752 MW. The absolute difference was 78 MW, 10.4% of the actual peak.
18 Figure 27 includes an hourly plot of the load forecast for July 2, 2018 as well as several plots to
19 assist in determining the sources of the differences between actual and forecast loads.
20

21 Figure 27(a) shows the hourly distribution of the load forecast compared to the actual load.
22 The hourly forecast predicted an 11:00 am peak of 828 MW; the actual peak was 745 MW and
23 occurred at 5:00 pm.
24

25 Figure 27(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
26 with the industrial component removed. The error in the forecast of the utility load was lower
27 than the error in the forecast of total load, meaning that error in the industrial load contributed
28 to the error in the total load forecast.

1 Figure 27(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was overestimated at peak. This would not have contributed to the
3 overestimation of the load forecast at peak.

4
5 Figure 27(d) shows the actual wind speed in St. John’s compared to the forecast. At peak, the
6 wind speed forecast was overestimated; however, the actual wind speed was so low that it is
7 not expected to have impacted the load. Figure 27(e) shows the actual cloud cover in St. John’s
8 compared to the forecast. During daylight hours, the forecast was largely overestimated,
9 however was accurate at peak. This could have contributed to the overestimation of the load
10 forecast through the day.

11
12 The discrepancy between actual and forecast utility load for July 2, 2018 was likely due to error
13 in the industrial load and wind speed and cloud cover forecast. The forecast remained poor
14 through the day. An overestimate of the load results in more than enough reserve being
15 available.

16

17 **2.3.25 July 5, 2018**

18 On July 5, 2018, the 7:20 am peak forecast, as reported to the Board, was 795 MW; the actual
19 reported peak was 716 MW. The absolute difference was 79 MW, 11.1% of the actual peak.

20 Figure 28 includes an hourly plot of the load forecast for July 5, 2018 as well as several plots to
21 assist in determining the sources of the differences between actual and forecast loads.

22

23 Figure 28(a) shows the hourly distribution of the load forecast compared to the actual load. The
24 hourly forecast predicted a 12:00 pm peak of 793 MW; the actual peak was 714 MW and
25 occurred at 5:00 pm.

26

27 Figure 28(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
28 with the industrial component removed. The error in the forecast of the utility load was low.

1 This suggests the error in the industrial load significantly contributed to the error in the total
2 load forecast.

3

4 Figure 28(c) shows the actual temperature in St. John's compared to the forecast. The
5 temperature forecast was underestimated for most of the day. The actual temperature was
6 approximately 6°C higher than forecast at peak.

7

8 Figure 28(d) shows the actual wind speed in St. John's compared to the forecast. At peak, the
9 wind speed forecast was underestimated; however, the wind speed was low and not
10 considered to have impacted the total load as the temperature was warm throughout the day.

11 Figure 28(e) shows the actual cloud cover in St. John's compared to the forecast. The forecast
12 was overestimated until noon where the cloud cover increased to more than forecast.

13

14 The discrepancy between actual and forecast utility load for July 5, 2018 was likely due to error
15 in the industrial load. The forecast remained poor through the day. An overestimate of the load
16 results in more than enough reserve being available.

17

18 **2.3.26 July 11, 2018**

19 On July 11, 2018, the 7:20 am peak forecast, as reported to the Board, was 770 MW; the actual
20 reported peak was 704 MW. The absolute difference was 66 MW, 9.4% of the actual peak.

21 Figure 29 includes an hourly plot of the load forecast for July 11, 2018 as well as several plots to
22 assist in determining the sources of the differences between actual and forecast loads.

23

24 Figure 29(a) shows the hourly distribution of the load forecast compared to the actual load. The
25 hourly forecast predicted a 12:00 pm peak of 770 MW; the actual peak was 702 MW.

26

27 Figure 29(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
28 with the industrial component removed. The error in the forecast of the utility load was

1 negligible. This suggests the error in the industrial load significantly contributed to the error in
2 the total load forecast.

3

4 Figure 29(c) shows the actual temperature in St. John’s compared to the forecast. The
5 temperature forecast was underestimated for the entire day; however, not expected to have
6 impacted the total actual load due to the warm seasonal temperature experienced.

7

8 Figure 29(d) shows the actual wind speed in St. John’s compared to the forecast. At peak, the
9 wind speed forecast was underestimated. Figure 29(e) shows the actual cloud cover in St.
10 John’s compared to the forecast. During daylight hours, the forecast was overestimated.

11

12 The discrepancy between actual and forecast utility load for July 11, 2018 was likely due to
13 error in the industrial load. The forecast remained poor through the day. An overestimate of
14 the load results in more than enough reserve being available.

15

16 **2.3.27 August 9, 2018**

17 On August 9, 2018, the 7:20 am peak forecast, as reported to the Board, was 785 MW; the
18 actual reported peak was 705 MW. The absolute difference was 80 MW, 11.3% of the actual
19 peak. Figure 30 includes an hourly plot of the load forecast for August 9, 2018 as well as several
20 plots to assist in determining the sources of the differences between actual and forecast loads.

21

22 Figure 30(a) shows the hourly distribution of the load forecast compared to the actual load. The
23 hourly forecast predicted a 12:00 pm peak of 784 MW; the actual peak was 703 MW and
24 occurred at 9:00 pm.

25

26 Figure 30(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
27 with the industrial component removed. The error in the forecast of the utility load was lower
28 than the error in the forecast of total load, meaning that error in the industrial load contributed
29 to the error in the total load forecast.

1 Figure 30(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was overestimated for most of the day.

3
4 Figure 30(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
5 was overestimated for the majority of the day, rising above forecast at 3:00 pm. Figure 30(e)
6 shows the actual cloud cover in St. John’s compared to the forecast. During daylight hours, the
7 forecast was underestimated.

8
9 The discrepancy between actual and forecast utility load for August 9, 2018 was likely due to
10 error in the industrial load. Discrepancy in weather is not expected to have impacted the total
11 actual load during the summer season. The forecast remained poor through the day. An
12 overestimate of the load results in more than enough reserve being available.

13
14 **2.3.28 August 17, 2018**

15 On August 17, 2018, the 7:20 am peak forecast, as reported to the Board, was 795 MW; the
16 actual reported peak was 724 MW. The absolute difference was 71 MW, 9.8% of the actual
17 peak. Figure 31 includes an hourly plot of the load forecast for August 17, 2018 as well as
18 several plots to assist in determining the sources of the differences between actual and forecast
19 loads.

20
21 Figure 31(a) shows the hourly distribution of the load forecast compared to the actual load. The
22 hourly forecast predicted a 12:00 pm peak of 754 MW; the actual peak was 722 MW.

23
24 Figure 31(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
25 with the industrial component removed. The error in the forecast of the utility load was lower
26 than the error in the forecast of total load, meaning that error in the industrial load contributed
27 to the error in the total load forecast.

1 Figure 31(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was overestimated for the entire day; however, the temperature
3 remained relatively warm. This is not expected to have affected the total load.

4

5 Figure 31(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
6 was overestimated for the entire day. Figure 31(e) shows the actual cloud cover in St. John’s
7 compared to the forecast. The forecast was accurate except from 3:00 pm to 5:00 pm where it
8 was overestimated.

9

10 The discrepancy between actual and forecast utility load for August 17, 2018 was likely due to
11 error in the industrial load. Discrepancy in weather is not expected to have impacted the total
12 actual load during the summer season. The forecast improved through the day. An
13 overestimate of the load results in more than enough reserve being available.

14

15 **2.3.29 August 21, 2018**

16 On August 21, 2018, the 7:20 am peak forecast, as reported to the Board, was 775 MW; the
17 actual reported peak was 705 MW. The absolute difference was 70 MW, 9.9% of the actual
18 peak. Figure 32 includes an hourly plot of the load forecast for August 21, 2018 as well as
19 several plots to assist in determining the sources of the differences between actual and forecast
20 loads.

21

22 Figure 32(a) shows the hourly distribution of the load forecast compared to the actual load. The
23 hourly forecast predicted a 12:00 pm peak of 775 MW; the actual peak was 704 MW and
24 occurred at 5:00 pm.

25

26 Figure 32(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
27 with the industrial component removed. The error in the forecast of the utility load was
28 negligible. This suggests the error in the industrial load significantly contributed to the error in
29 the total load forecast.

1 Figure 32(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was relatively accurate for the entire day.

3
4 Figure 32(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
5 was overestimated for the majority of the day. Figure 32(e) shows the actual cloud cover in St.
6 John’s compared to the forecast. The forecast was underestimated until 9:00 am where it
7 remained relatively accurate for the rest of the day.

8
9 The discrepancy between actual and forecast utility load for August 21, 2018 was likely due to
10 error in the industrial load. Discrepancy in weather is not expected to have impacted the total
11 actual load during the summer season. The forecast improved through the day. An
12 overestimate of the load results in more than enough reserve being available.

13

14 **2.3.30 September 3, 2018**

15 On September 3, 2018, the 7:20 am peak forecast, as reported to the Board, was 765 MW; the
16 actual reported peak was 695 MW. The absolute difference was 70 MW, 10.0% of the actual
17 peak. Figure 33 includes an hourly plot of the load forecast for September 3, 2018 as well as
18 several plots to assist in determining the sources of the differences between actual and forecast
19 loads.

20

21 Figure 33(a) shows the hourly distribution of the load forecast compared to the actual load. The
22 hourly forecast predicted a 12:00 pm peak of 765 MW; the actual peak was 687 MW and
23 occurred at 9:00 pm.

24

25 Figure 33(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
26 with the industrial component removed. The error in the forecast of the utility load was lower
27 than the error in the forecast of total load, meaning that error in the industrial load contributed
28 to the error in the total load forecast.

1 Figure 33(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was relatively accurate for the entire day.

3
4 Figure 33(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
5 was underestimated at time of peak. Figure 33(e) shows the actual cloud cover in St. John’s
6 compared to the forecast. The forecast was overestimated until 9:00 am where it remained
7 relatively underestimated for the majority of the day; however, this would not have had an
8 effect on the load overestimate at a 9:00 pm peak.

9
10 The discrepancy between actual and forecast utility load for September 3, 2018 was a result of
11 error in industrial load. An overestimate of the load results in more than enough reserve being
12 available. The forecast did not improve through the day.

13
14 **2.3.31 September 7, 2018**

15 On September 7, 2018, the 7:20 am peak forecast, as reported to the Board, was 765 MW; the
16 actual reported peak was 688 MW. The absolute difference was 77 MW, 11.1% of the actual
17 peak. Figure 34 includes an hourly plot of the load forecast for September 7, 2018 as well as
18 several plots to assist in determining the sources of the differences between actual and forecast
19 loads.

20
21 Figure 34(a) shows the hourly distribution of the load forecast compared to the actual load.
22 The hourly forecast predicted a 12:00 pm peak of 766 MW; the actual peak was 688 MW and
23 occurred at 5:00 pm.

24
25 Figure 34(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
26 with the industrial component removed. The error in the forecast of the utility load was lower
27 than the error in the forecast of total load, meaning that error in the industrial load contributed
28 to the error in the total load forecast.

1 Figure 34(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was relatively accurate for the entire day.

3
4 Figure 34(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
5 was overestimated for the majority of the day; however, was underestimated at peak. The wind
6 speed was low and not expected to have had an impact on the total load. Figure 34(e) shows
7 the actual cloud cover in St. John’s compared to the forecast. The forecast was underestimated
8 for the majority of daylight hours.

9
10 The discrepancy between actual and forecast utility load for September 7, 2018 was a result of
11 error in industrial load. An overestimate of the load results in more than enough reserve being
12 available. The forecast did not improve through the day.

13
14 **2.3.32 September 8, 2018**

15 On September 8, 2018, the 7:20 am peak forecast, as reported to the Board, was 745 MW; the
16 actual reported peak was 682 MW. The absolute difference was 63 MW, 9.2% of the actual
17 peak. Figure 35 includes an hourly plot of the load forecast for September 8, 2018 as well as
18 several plots to assist in determining the sources of the differences between actual and forecast
19 loads.

20
21 Figure 35(a) shows the hourly distribution of the load forecast compared to the actual load. The
22 hourly forecast predicted a 12:00 pm peak of 747 MW; the actual peak was 679 MW.

23
24 Figure 35(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
25 with the industrial component removed. The error in the forecast of the utility load was lower
26 than the error in the forecast of total load, meaning that error in the industrial load contributed
27 to the error in the total load forecast.

1 Figure 35(c) shows the actual temperature in St. John’s compared to the forecast. The
2 temperature forecast was relatively accurate for the entire day.

3
4 Figure 35(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
5 was overestimated for the majority of the day; however, was underestimated at peak. The wind
6 speed was low and not expected to have had an impact on the total load. Figure 35(e) shows
7 the actual cloud cover in St. John’s compared to the forecast. The forecast was underestimated
8 at peak.

9
10 The discrepancy between actual and forecast utility load for September 8, 2018 was a result of
11 error in industrial load. An overestimate of the load results in more than enough reserve being
12 available. The forecast did not improve through the day.

13

14 **2.3.33 October 5, 2018**

15 On October 5, 2018, the 7:20 am peak forecast, as reported to the Board, was 875 MW; the
16 actual reported peak was 778 MW. The absolute difference was 97 MW, 12.4% of the actual
17 peak. Figure 36 includes an hourly plot of the load forecast for October 5, 2018 as well as
18 several plots to assist in determining the sources of the differences between actual and forecast
19 loads.

20

21 Figure 36(a) shows the hourly distribution of the load forecast compared to the actual load. The
22 hourly forecast predicted an 8:00 pm peak of 875 MW; the actual peak was 773 MW at
23 11:00 am.

24

25 Figure 36(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
26 with the industrial component removed. The error in the forecast of the utility load was
27 significantly less than the error in the forecast of total load. This means that the error in the
28 industrial load contributed to the error in the load forecast.

1 Figure 36(c) shows the actual temperature in St. John’s compared to the forecast. The load was
2 forecast to have two peaks on October 5, 2018, one in the late morning and one mid-evening.
3 The temperature was underestimated for much of the day. In the mid to late afternoon the
4 actual temperature was up to 8°C higher than forecast. This meant the second, higher load
5 peak in the evening did not occur, making the first peak of the day the daily peak.

6
7 Figure 36(d) shows the actual wind speed in St. John’s compared to the forecast. The actual
8 wind speed was lower than forecast all day, which would also have contributed to the forecast
9 error. Figure 36(e) shows the forecast and actual cloud cover. The forecast overestimated the
10 cloud cover for most of the day, which could also have contributed to the forecast error.

11
12 The discrepancy between actual and forecast utility load for October 5, 2018 was a result of
13 errors in the weather forecast. An overestimate of the load results in more than enough
14 reserve being available.

15

16 **2.3.34 October 30, 2018**

17 On October 30, 2018, the 7:20 am peak forecast, as reported to the Board, was 955 MW; the
18 actual reported peak was 864 MW. The absolute difference was 91 MW, 10.5% of the actual
19 peak. Figure 37 includes an hourly plot of the load forecast for October 30, 2018 as well as
20 several plots to assist in determining the sources of the differences between actual and forecast
21 loads.

22

23 Figure 37(a) shows the hourly distribution of the load forecast compared to the actual load. The
24 hourly forecast predicted a 5:00 pm peak of 953 MW; the actual peak was 862 MW and
25 occurred at 6:00 pm.

26

27 Figure 37(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
28 with the industrial component removed. The error in the forecast of the utility load was lower

1 than the error in the forecast of total load, meaning that error in the industrial load contributed
2 to the error in the total load forecast.

3

4 Figure 37(c) shows the actual temperature in St. John’s compared to the forecast. The
5 temperature forecast was underestimated for the entire day. This likely contributed to the
6 overestimate of load.

7

8 Figure 37(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
9 was relatively accurate until peak where the forecast wind speed was underestimated. Figure
10 37(e) shows the actual cloud cover in St. John’s compared to the forecast. The forecast was
11 accurate during daylight hours.

12

13 The discrepancy between actual and forecast utility load for October 30, 2018 was primarily a
14 result of errors in the temperature forecast and industrial load. An overestimate of the load
15 results in more than enough reserve being available. The forecast did not improve throughout
16 the day.

17

18 **2.3.35 October 31, 2018**

19 On October 31, 2018, the 7:20 am peak forecast, as reported to the Board, was 1045 MW; the
20 actual reported peak was 971 MW. The absolute difference was 74 MW, 7.6% of the actual
21 peak. Figure 38 includes an hourly plot of the load forecast for October 31, 2018 as well as
22 several plots to assist in determining the sources of the differences between actual and forecast
23 loads.

24

25 Figure 38(a) shows the hourly distribution of the load forecast compared to the actual load. The
26 hourly forecast predicted a 7:00 pm peak of 1045 MW; the actual peak was 966 MW at
27 occurred at 6:00 pm.

1 Figure 38(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
2 with the industrial component removed. The error in the forecast of the utility load was lower
3 than the error in the forecast of total load, meaning that error in the industrial load contributed
4 to the error in the total load forecast.

5
6 Figure 38(c) shows the actual temperature in St. John's compared to the forecast. The
7 temperature forecast was relatively accurate until 1:00 pm where it was overestimated for the
8 remainder of the day.

9
10 Figure 38(d) shows the actual wind speed in St. John's compared to the forecast. The forecast
11 was overestimated for the majority of the day. This could have contributed to the overestimate
12 of the load forecast. Figure 38(e) shows the actual cloud cover in St. John's compared to the
13 forecast. The forecast was accurate at peak.

14
15 The discrepancy between actual and forecast utility load for October 31, 2018 was primarily a
16 result of errors in the wind speed forecast and industrial load. An overestimate of the load
17 results in more than enough reserve being available. The forecast did improve throughout the
18 day; however, not until after peak.

19
20 **2.3.36 November 6, 2018**

21 On November 6, 2018, the 7:20 am peak forecast, as reported to the Board, was 1275 MW; the
22 actual reported peak was 1051 MW. The absolute difference was 224 MW, 21.3% of the actual
23 peak. Figure 39 includes an hourly plot of the load forecast for November 6 as well as several
24 plots to assist in determining the sources of the differences between actual and forecast loads.

25
26 Figure 39(a) shows the hourly distribution of the load forecast compared to the actual load. The
27 hourly forecast predicted a 5:00 pm peak of 1273 MW; the actual peak was 1033 MW.

1 Figure 39(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
2 with the industrial component removed. The error in the forecast of the utility load was
3 significantly lower than the error in the forecast of total load. The hourly forecast predicted a
4 utility peak at 5:00 pm of 1085 MW; the actual peak was 968 MW.

5
6 Figure 39(c) shows the actual temperature in St. John's compared to the forecast. The actual
7 temperature was below forecast most of the day with a difference of up to 2°C in the early to
8 mid-afternoon. This typically would result in load being higher than forecast so errors in the
9 temperature forecast would not have contributed to the error in the load forecast.

10
11 In addition, the shape of the temperature profile was unusual with forecast and actual
12 temperatures rising into overnight.

13
14 Figure 39(d) shows the actual wind speed in St. John's compared to the forecast. The actual
15 wind speed was below forecast for most of the day but both forecast and actual wind speeds
16 were low so the error should not have had a significant impact on the load. Figure 39(e) shows
17 the forecast and actual cloud cover. The actual cloud cover was greater than forecast for most
18 of the day, however this would have suggested an increase in load, not a decrease in load.

19
20 The discrepancy between actual and forecast load for November 6, 2018 was likely a result of
21 errors in the industrial load. The forecast improved as the day went on. An overestimate of the
22 load results in more than enough reserve being available.

23 24 **2.3.37 November 7, 2018**

25 On November 7, 2018, the 7:20 am peak forecast, as reported to the Board, was 1130 MW; the
26 actual reported peak was 962 MW. The absolute difference was 168 MW, 17.5% of the actual
27 peak. Figure 40 includes an hourly plot of the load forecast for November 7, 2018 as well as
28 several plots to assist in determining the sources of the differences between actual and forecast
29 loads.

1 Figure 40(a) shows the hourly distribution of the load forecast compared to the actual load. The
2 hourly forecast predicted a 5:00 pm peak of 1128 MW; the actual peak was 954 MW and
3 occurred at 9:00 am.

4
5 Figure 40(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
6 with the industrial component removed. The error in the forecast of the utility load was
7 significantly lower than the error in the forecast of total load, meaning that error in the
8 industrial load was a large contributor to the error in the total load forecast.

9
10 Figure 40(c) shows the actual temperature in St. John’s compared to the forecast. The
11 temperature forecast was relatively accurate for most of the day.

12
13 Figure 40(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
14 was overestimated for most of the day. This could have contributed to the overestimate of
15 load. Figure 40(e) shows the actual cloud cover in St. John’s compared to the forecast. The
16 forecast was overestimated during most of the day, which could have also contributed to the
17 overestimate of load.

18
19 The discrepancy between actual and forecast load for November 7, 2018 was likely a result of
20 errors in the industrial load, as well as wind speed and cloud cover forecast. An overestimate of
21 the load results in more than enough reserve being available. The forecast did not improve
22 throughout the day.

23
24 **2.3.38 November 8, 2018**

25 On November 8, 2018, the 7:20 am peak forecast, as reported to the Board, was 1090 MW; the
26 actual reported peak was 938 MW. The absolute difference was 152 MW, 16.2% of the actual
27 peak. Figure 41 includes an hourly plot of the load forecast for November 8, 2018 as well as
28 several plots to assist in determining the sources of the differences between actual and forecast
29 loads.

1 Figure 41(a) shows the hourly distribution of the load forecast compared to the actual load. The
2 hourly forecast predicted a 7:00 pm peak of 1042 MW; the actual peak was 930 MW and
3 occurred at 5:00 pm.

4
5 Figure 41(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
6 with the industrial component removed. The error in the forecast of the utility load was
7 negligible. This suggests the error in the industrial load significantly contributed to the error in
8 the total load forecast.

9
10 Figure 41(c) shows the actual temperature in St. John’s compared to the forecast. The
11 temperature forecast was relatively accurate throughout the day.

12
13 Figure 41(d) shows the actual wind speed in St. John’s compared to the forecast. The forecast
14 was accurate throughout the day. Figure 41(e) shows the actual cloud cover in St. John’s
15 compared to the forecast. The forecast was underestimated during most of the day; however,
16 this could not have contributed to the overestimation of load.

17
18 The discrepancy between actual and forecast load for November 8, 2018 was likely a result of
19 errors in the industrial load. An overestimate of the load results in more than enough reserve
20 being available. The forecast did not improve throughout the day.

21
22 **2.3.39 December 7, 2018**

23 On December 7, 2018, the 7:20 am peak forecast, as reported to the Board, was 1470 MW; the
24 actual reported peak was 1393 MW. The absolute difference was 77 MW, 5.5% of the actual
25 peak. Figure 42 includes an hourly plot of the load forecast for December 7, 2018 as well as
26 several plots to assist in determining the sources of the differences between actual and forecast
27 loads.

1 Figure 42(a) shows the hourly distribution of the load forecast compared to the actual load. The
2 hourly forecast predicted a 5:00 pm peak of 1470 MW; the actual peak was 1383 MW.

3

4 Figure 42(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
5 with the industrial component removed. The error in the forecast of the utility load was lower
6 than the error in the forecast of total load, meaning that error in the industrial load contributed
7 to the error in the total load forecast.

8

9 Figure 42(c) shows the actual temperature in St. John's compared to the forecast. The
10 temperature forecast was overestimated for the majority of the day; however, was accurate at
11 peak.

12

13 Figure 42(d) shows the actual wind speed in St. John's compared to the forecast. The forecast
14 was overestimated throughout the day. The reduction in wind speed could have contributed to
15 the overestimation of load. Figure 42(e) shows the actual cloud cover in St. John's compared to
16 the forecast. The forecast was underestimated during daylight hours; however, this would not
17 have contributed to the overestimation of load.

18

19 The discrepancy between actual and forecast load for December 7, 2018 was likely a result of
20 errors in the industrial load and wind speed forecast. An overestimate of the load results in
21 more than enough reserve being available. The forecast did improve throughout the day.

22

23 **2.3.40 December 8, 2018**

24 On December 8, 2018, the 7:20 am peak forecast, as reported to the Board, was 1330 MW; the
25 actual reported peak was 1410 MW. The absolute difference was 80 MW, 5.7% of the actual
26 peak. Figure 43 includes an hourly plot of the load forecast for December 8, 2018 as well as
27 several plots to assist in determining the sources of the differences between actual and forecast
28 loads.

1 Figure 43(a) shows the hourly distribution of the load forecast compared to the actual load. The
2 hourly forecast predicted a 6:00 pm peak of 1329 MW; the actual peak was 1405 MW at 5:00
3 pm.

4
5 Figure 43(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
6 with the industrial component removed. The error in the forecast of the utility load was slightly
7 higher than the error in the forecast of total load. This means that the error in the industrial
8 load masked some of the error in the utility load. The hourly forecast predicted a utility peak at
9 6:00 pm of 1142 MW; the actual peak was 1227 MW at 5:00 pm.

10
11 Figure 43(c) shows the actual temperature in St. John's compared to the forecast. The actual
12 temperature was lower than forecast during the morning; however, the forecast was improved
13 at time of peak.

14
15 Figure 43(d) shows the actual wind speed in St. John's compared to the forecast. The actual
16 wind speed was below forecast for most of the day, but both forecast and actual wind speeds
17 were low so the error should not have contributed to the forecast error. Figure 43(e) shows the
18 forecast and actual cloud cover. The actual cloud cover was greater than forecast for most of
19 the day.

20
21 The discrepancy between actual and forecast load for December 8, 2018 was likely a result of
22 errors in the weather forecast and non-uniform customer behaviour. The forecast did improve
23 as the day went on; however, the load remained underestimated. Energy Control Centre
24 operators were aware of the error and responded accordingly to maintain sufficient reserves
25 throughout the peak period.

26

27 **2.3.41 December 18, 2018**

28 On December 18, 2018, the 7:20 am peak forecast, as reported to the Board, was 1425 MW;
29 the actual reported peak was 1293 MW. The absolute difference was 132 MW, 10.2% of the

1 actual peak. Figure 44 includes an hourly plot of the load forecast for December 18, 2018 as
2 well as several plots to assist in determining the sources of the differences between actual and
3 forecast loads.

4
5 Figure 44(a) shows the hourly distribution of the load forecast compared to the actual load. The
6 hourly forecast predicted a 5:00 pm peak of 1425 MW; the actual peak was 1288 MW.

7
8 Figure 44(b) shows the hourly distribution of the utility load forecast only, i.e., the load forecast
9 with the industrial component removed. The error in the forecast of the utility load was lower
10 than the error in the forecast of total load. This means that the error in the industrial load
11 masked some of the error in the utility load. The hourly forecast predicted a utility peak at 5:00
12 pm of 1237 MW; the actual peak was 1117 MW.

13
14 Figure 44(c) shows the actual temperature in St. John's compared to the forecast. The
15 temperatures were lower than forecast until noon, at which point temperatures continued to
16 increase through the afternoon before dropping similar to the forecast by peak.

17
18 Figure 44(d) shows the actual wind speed in St. John's compared to the forecast. The actual
19 wind speed was below forecast for most of the day, which could have contributed to the
20 forecast error. Figure 44(e) shows the forecast and actual cloud cover. The actual cloud cover
21 was lower than forecast so that could have also contributed to the forecast error.

22
23 The discrepancy between actual and forecast load for December 18, 2018 was likely a result of
24 errors in the weather forecast. An overestimate of the load results in more than enough reserve
25 being available.

26

27 **3 Forecast Accuracy Review**

28 Tables 4 and 5 summarize the average and maximum errors in the peak of the utility load
29 forecast by month for the fourteen months of the reporting period. The absolute percent error

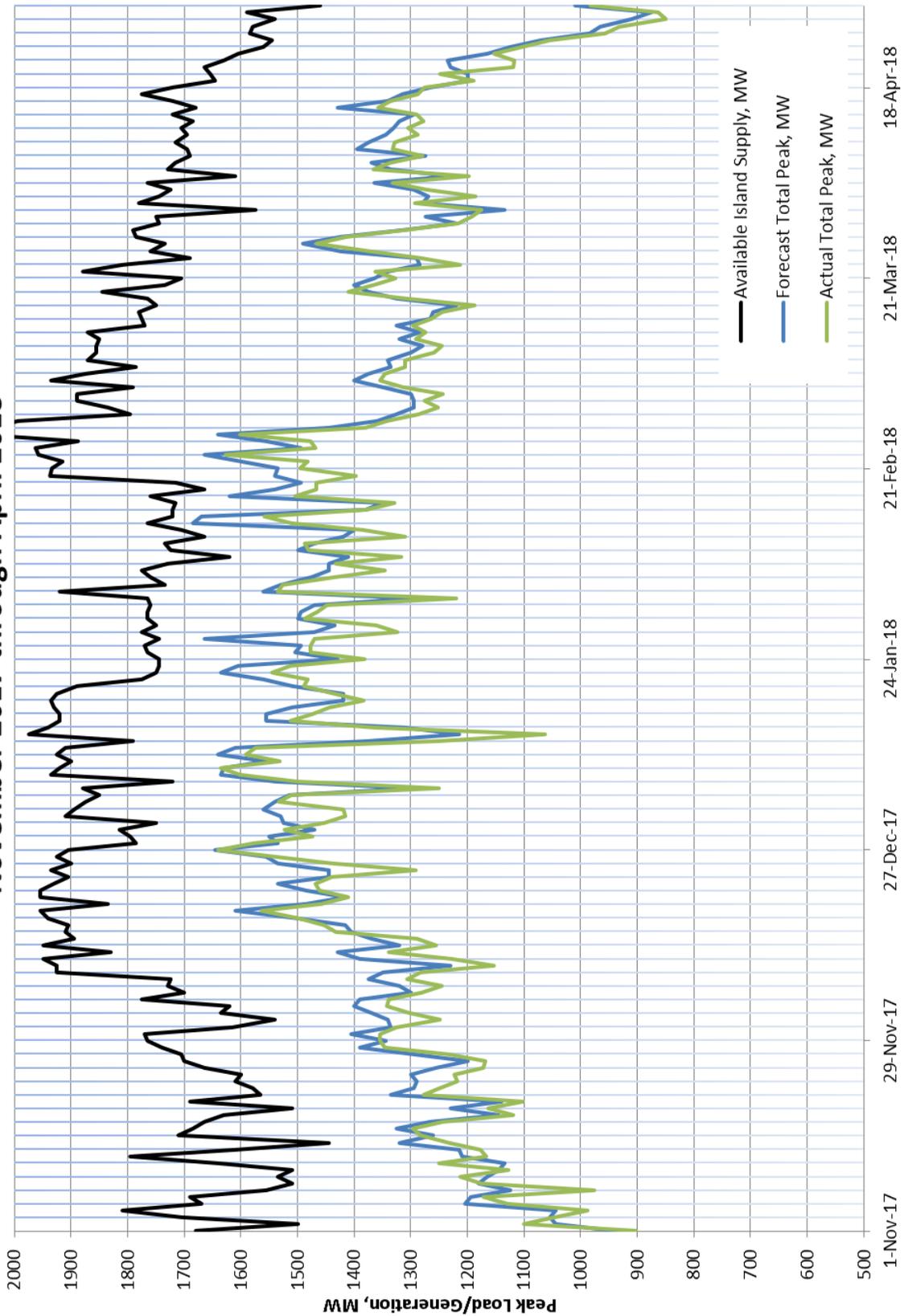
1 varied between 1.8% and 3.8% with an average of 2.9%. There does not appear to be any
2 seasonal correlation. The maximum absolute error varied between 6.6% and 13.9%. Again,
3 there does not appear to be any seasonal correlation. The average and maximum errors were
4 positive in all but three months, i.e., the forecast typically overestimates, rather than
5 underestimates, the load.

6
7 Table 6 summarizes the error at the ten highest loads during the reporting period. The highest
8 loads in this reporting period occurred in December (three instances, with one in 2017 and two
9 in 2018), January (four instances) and February (three instances). Four of the ten maximum
10 loads were overestimated; six were underestimated. The average error varied from -4.1% to
11 2.2%; the overall average was -0.9%. The absolute percent error varied from 0.3% to 4.1%, with
12 an average of 1.8%. These statistics confirm that there is no correlation between high load and
13 high error in the load forecast.

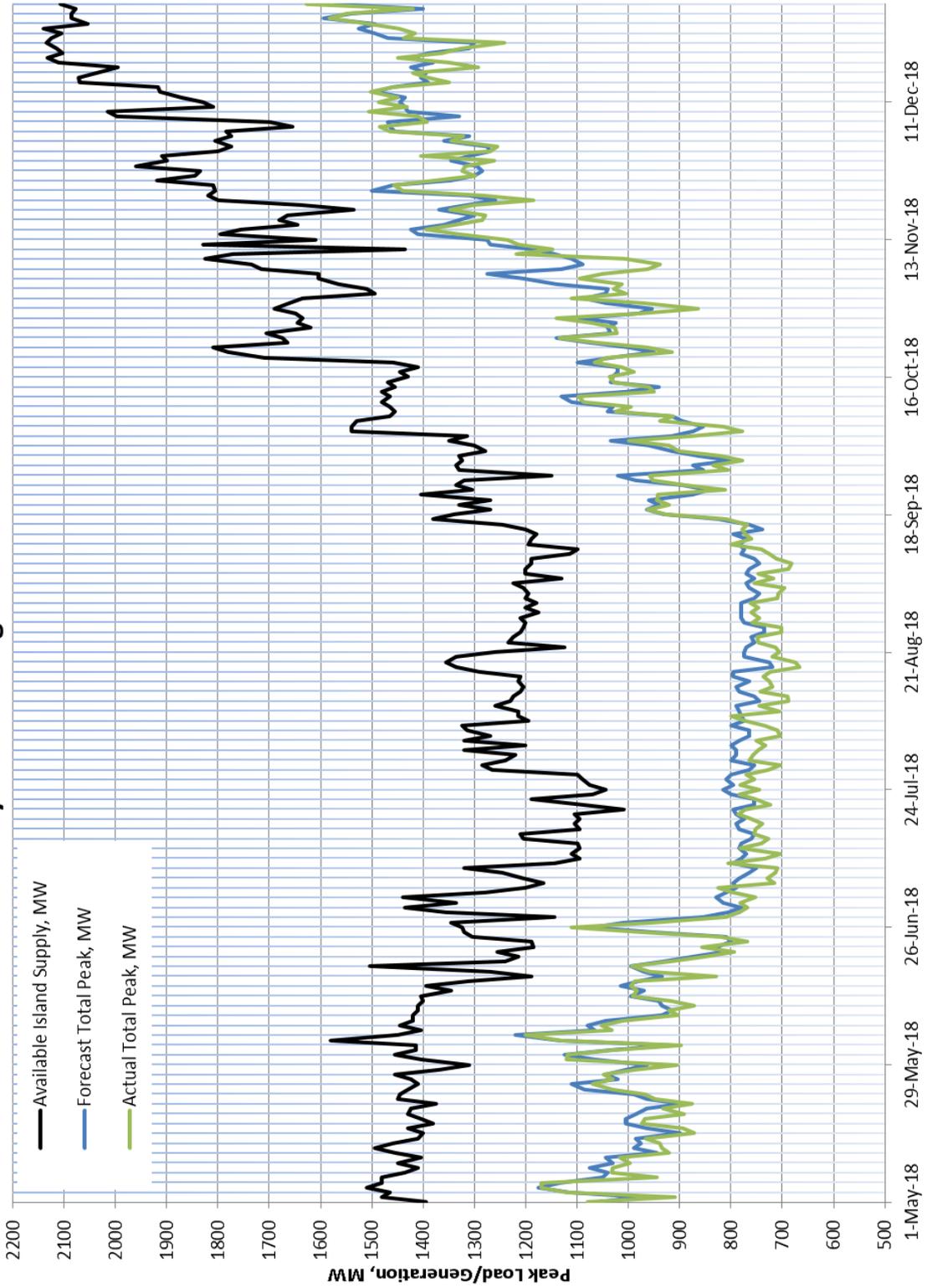
14
15 Table 7 summarizes the result of the investigations into instances of high forecast error. Most
16 errors occur as a result of errors in the industrial forecast and errors in the weather forecast,
17 largely driven by errors in temperature and wind speed forecasting. As noted above, the
18 absolute percent errors appear to be greater on weekends and holidays. Hydro observes that
19 unseasonable temperatures and unusual temperature profiles lead to errors in load forecasts.
20 Some errors remain unexplained; they result from unpredictable customer behavior that is not
21 modelled by Nostradamus.

Appendix A
Tables and Figures

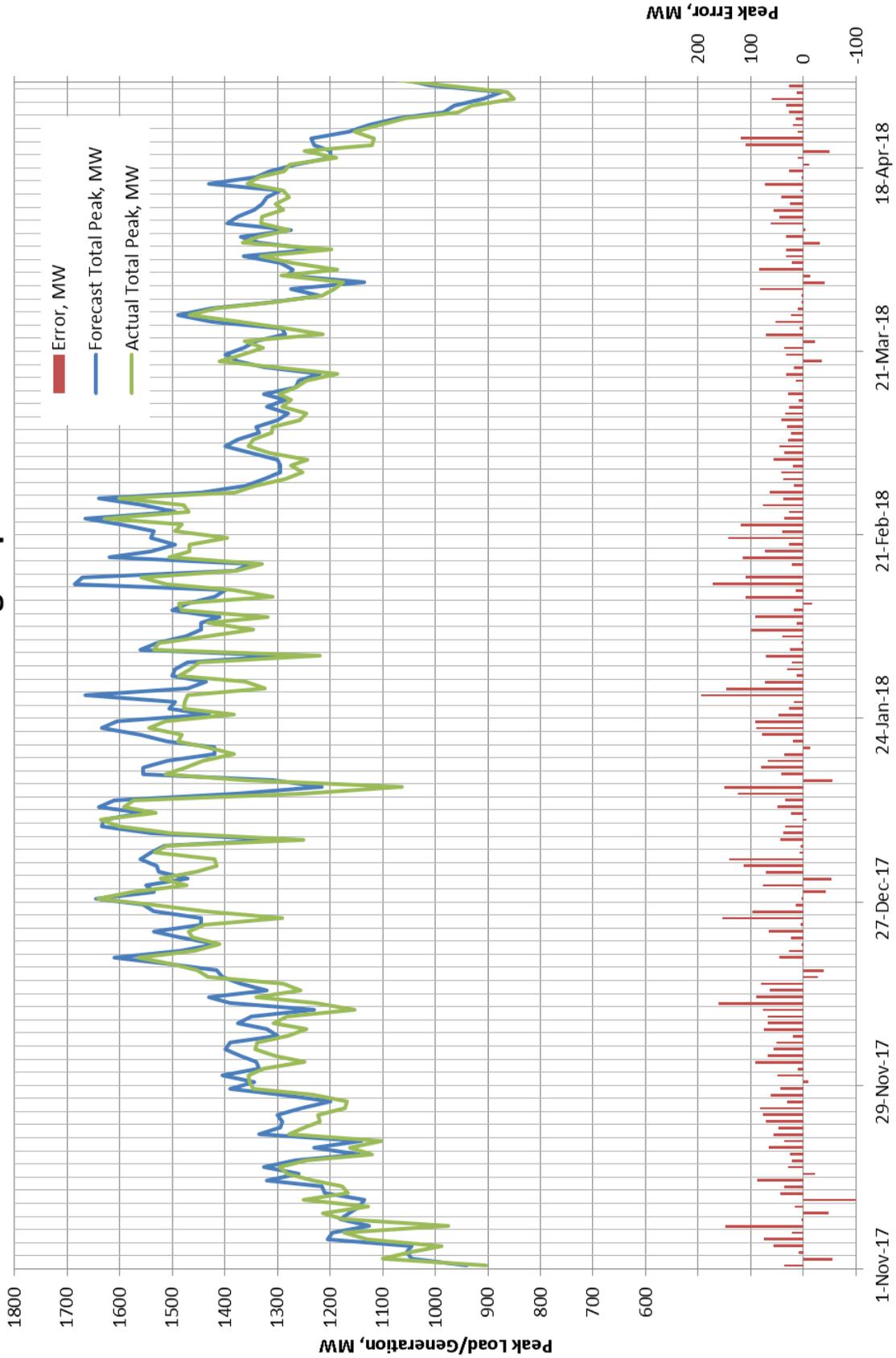
Figure 1(a): Peak Forecast, Total Load and Available Supply
November 2017 through April 2018



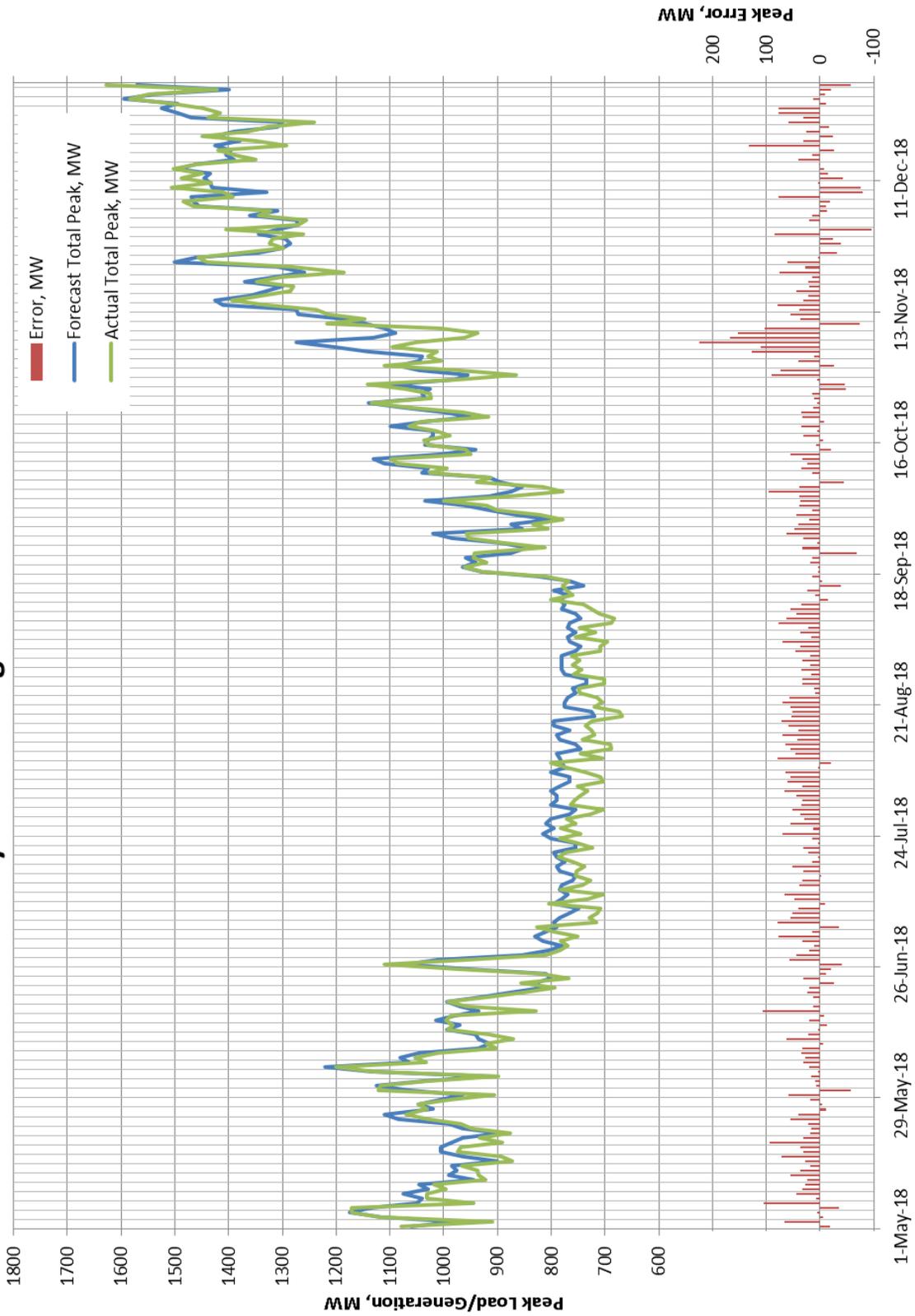
**Figure 1(b): Peak Forecast, Total Load and Available Supply
May 2018 through December 2018**



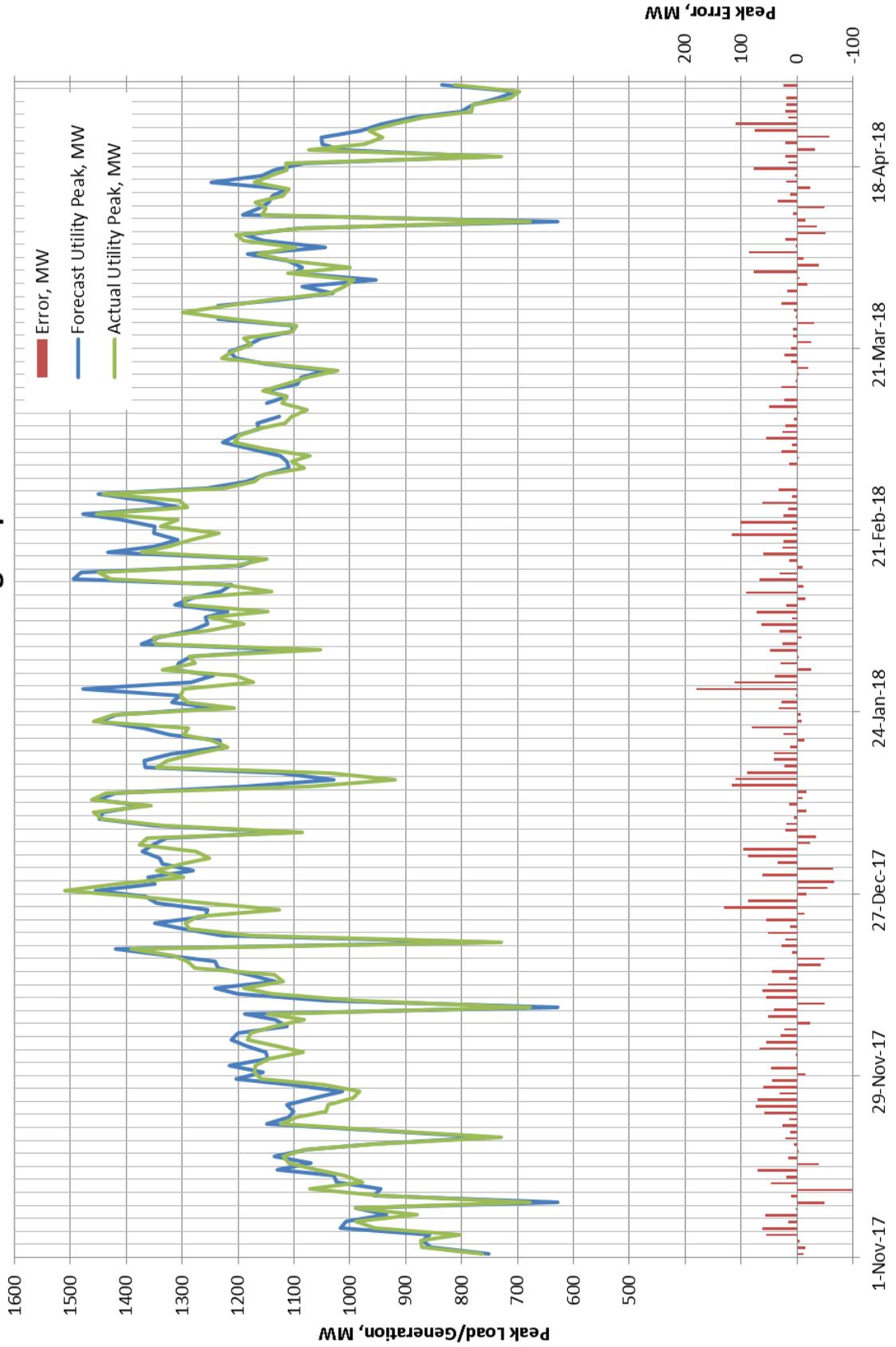
**Figure 2(a): Peak Forecast, Total Load and Error
November 2017 through April 2018**



**Figure 2(b): Peak Forecast, Total Load and Error
May 2018 through December 2018**



**Figure 3(a): Peak Forecast , Utility Load and Error
November 2017 through April 2018**



**Figure 3(b): Peak Forecast, Utility Load and Error
May 2018 through December 2018**

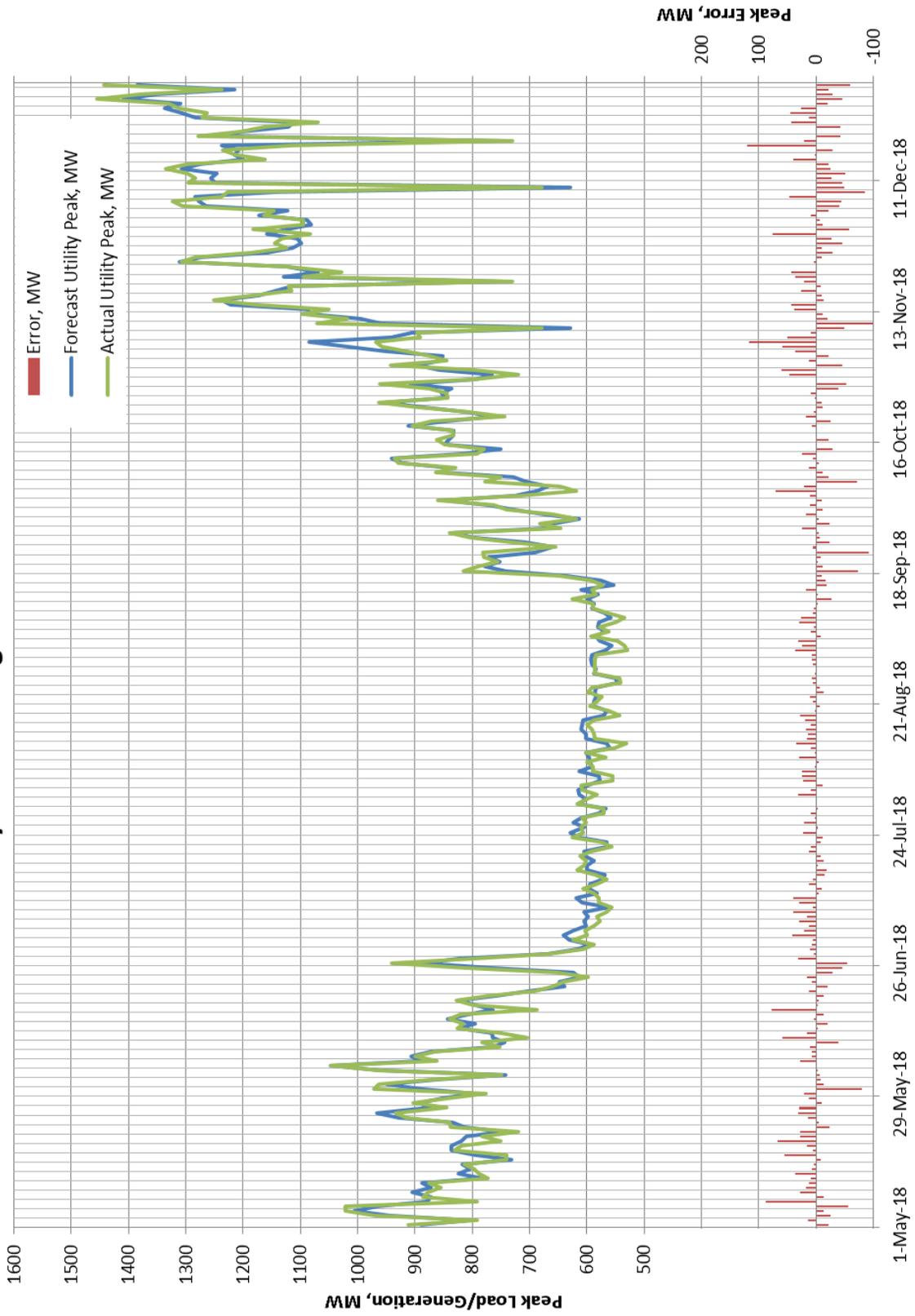


Figure 4 Accuracy Analysis - Nov 07, 2017

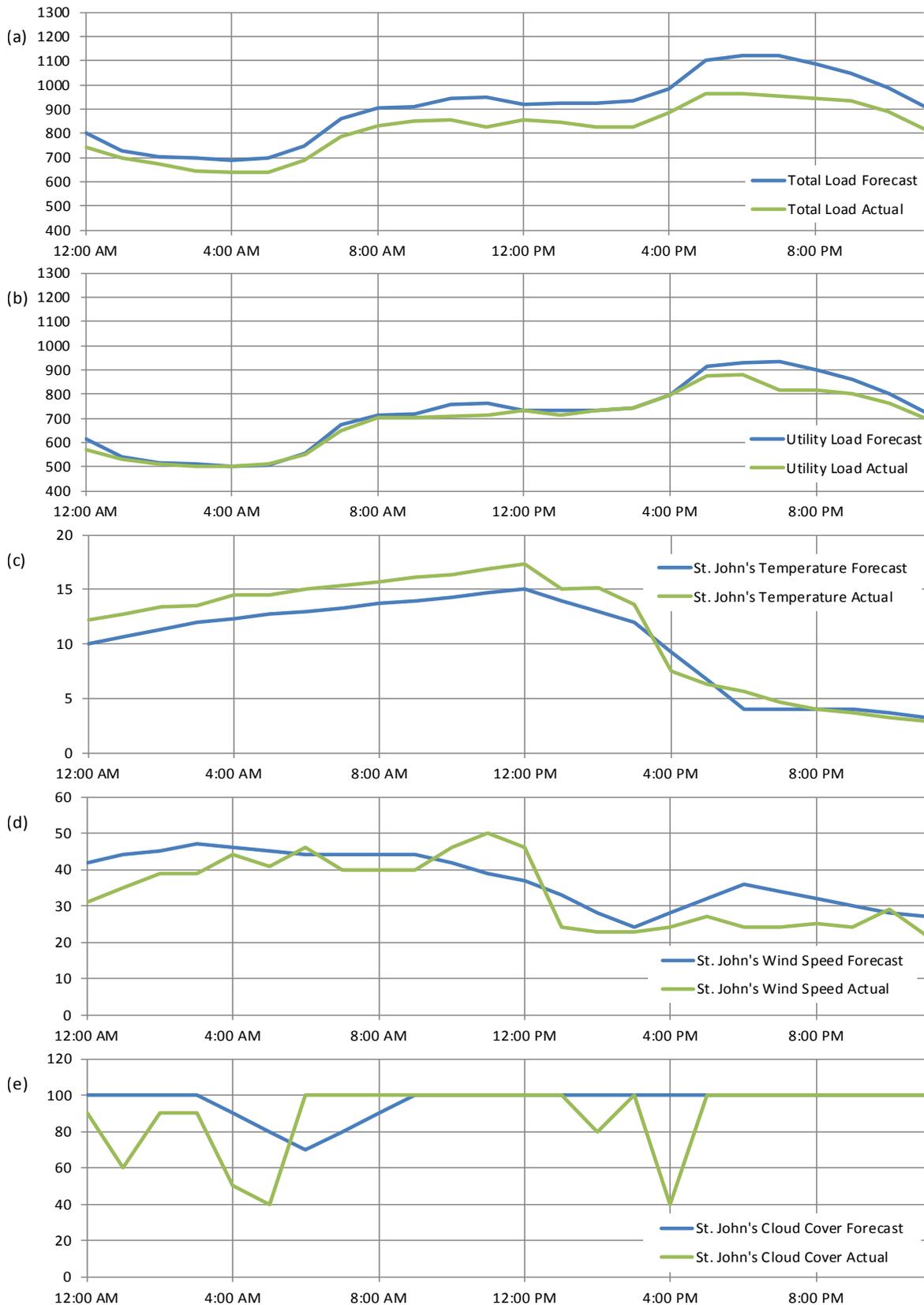


Figure 5 Accuracy Analysis - Nov 11, 2017

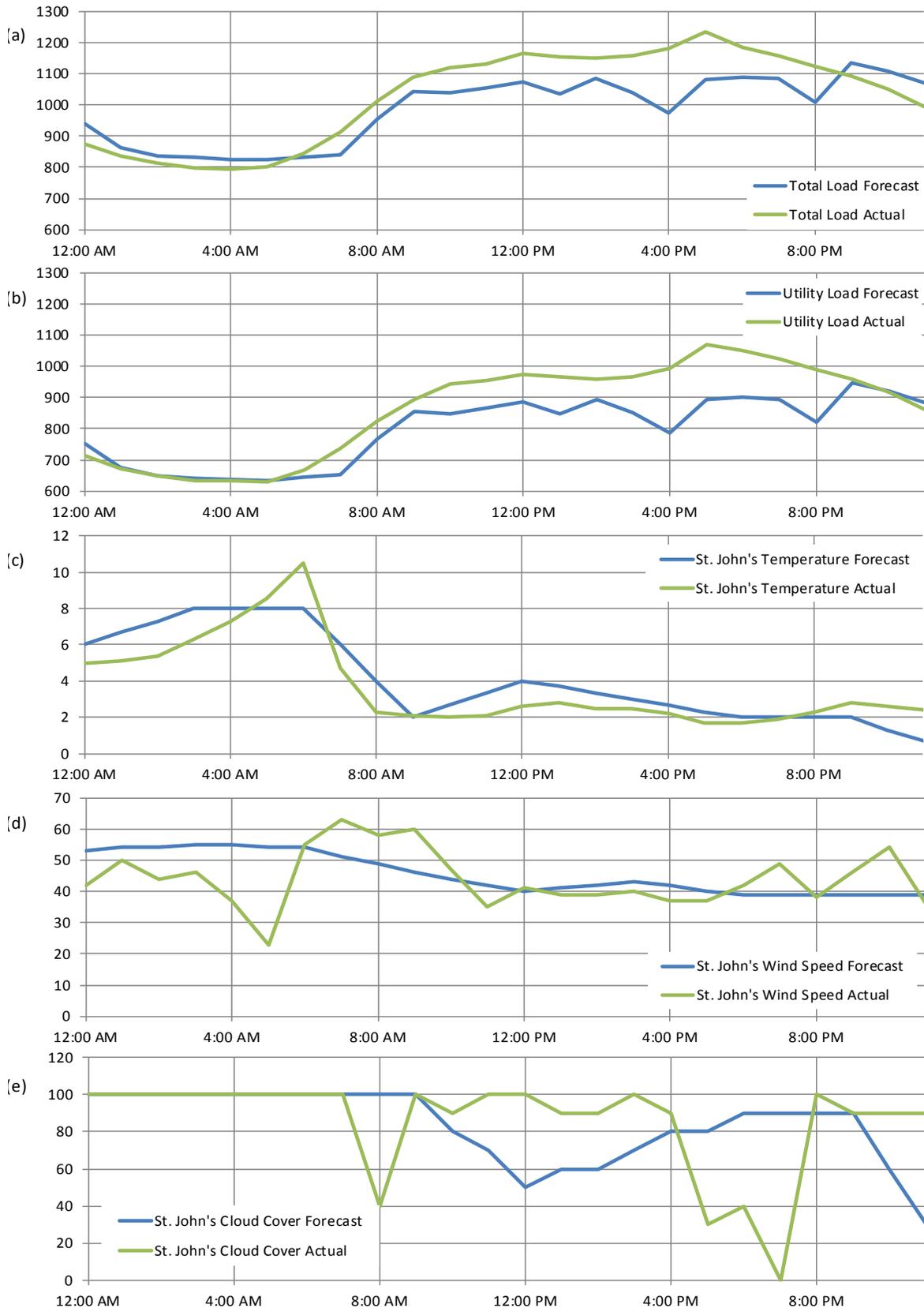


Figure 6 Accuracy Analysis - Nov 25, 2017

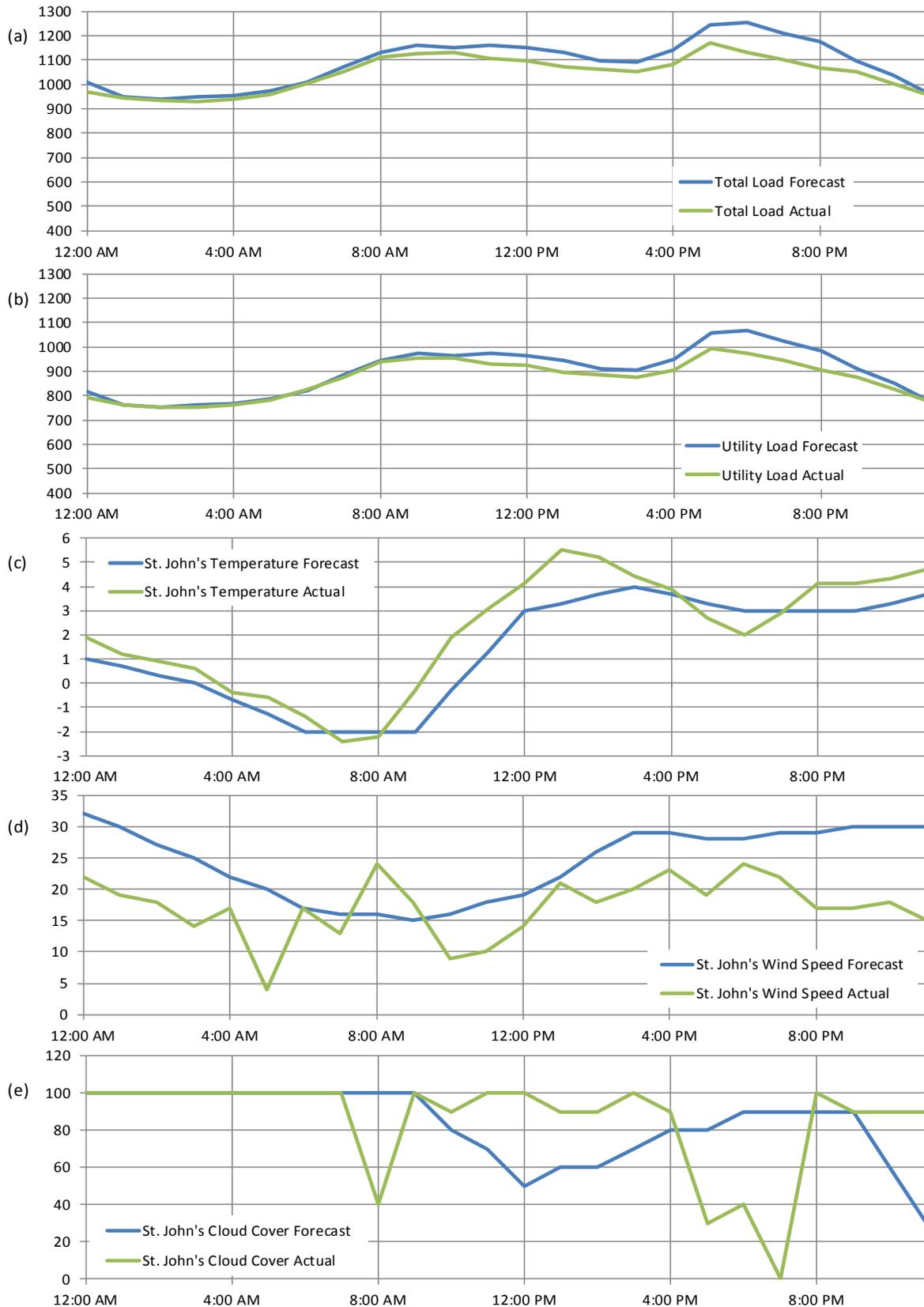


Figure 7 Accuracy Analysis - Dec 02, 2017

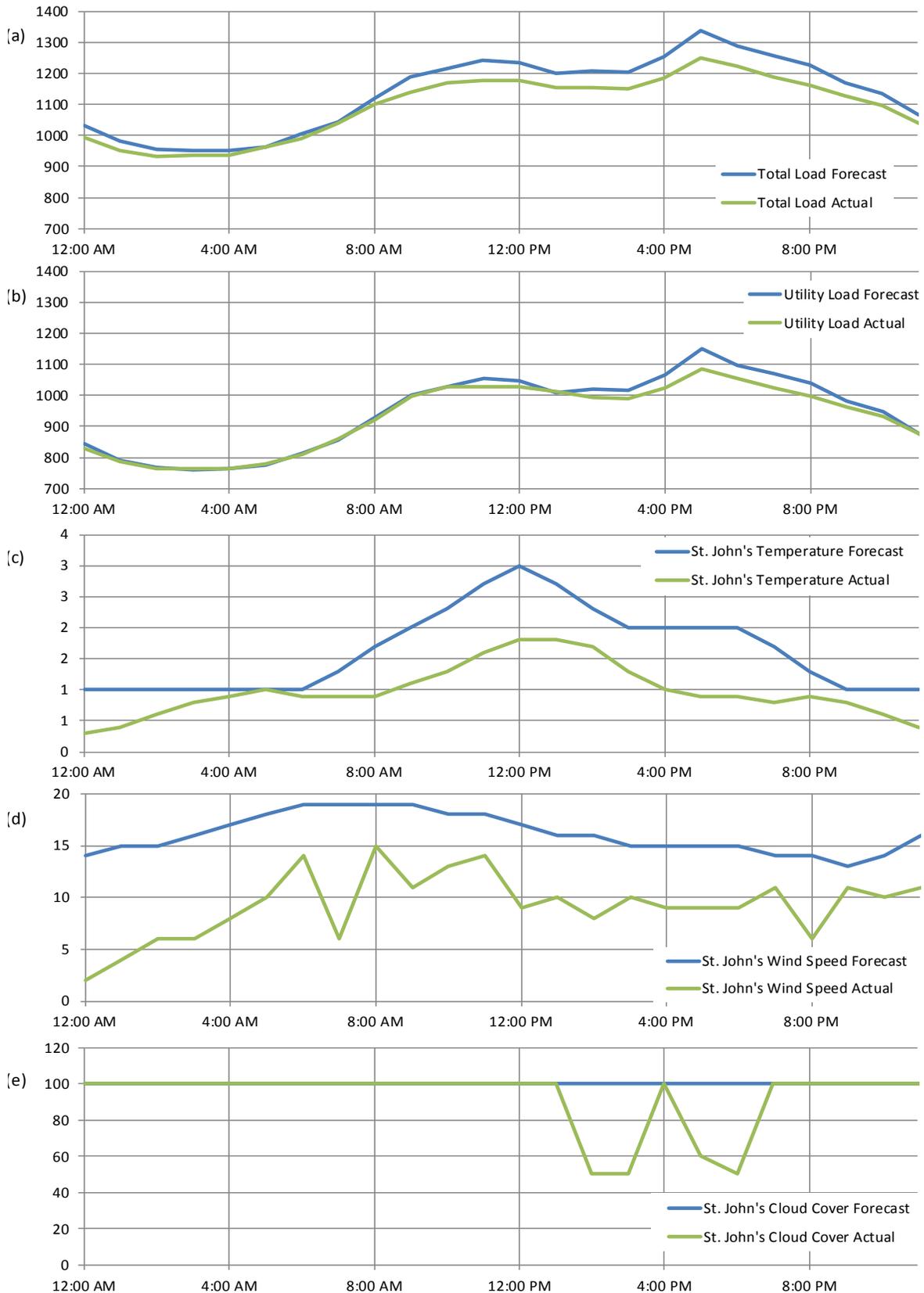


Figure 8 Accuracy Analysis - Dec 11, 2017

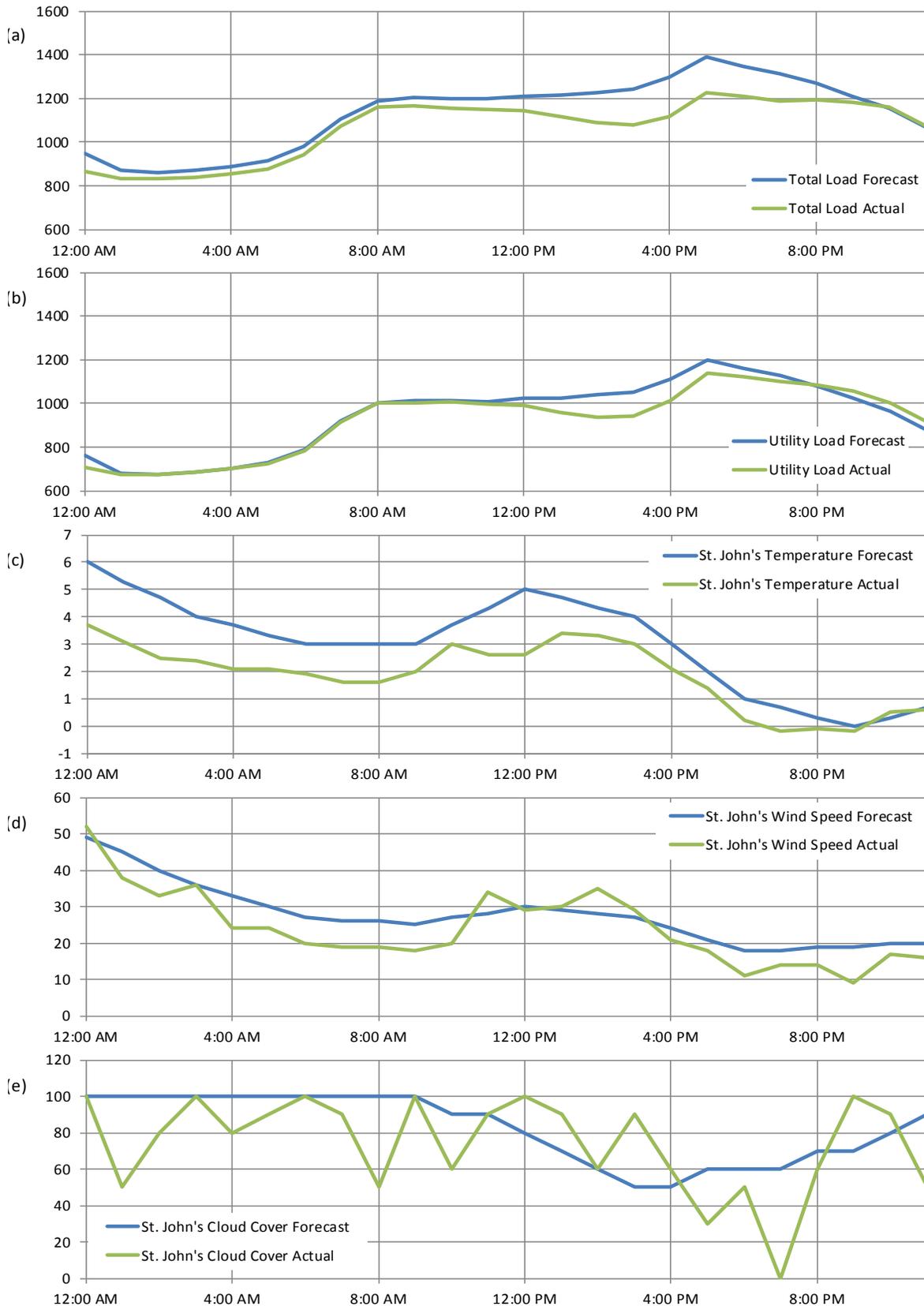


Figure 9 Accuracy Analysis - Dec 24, 2017

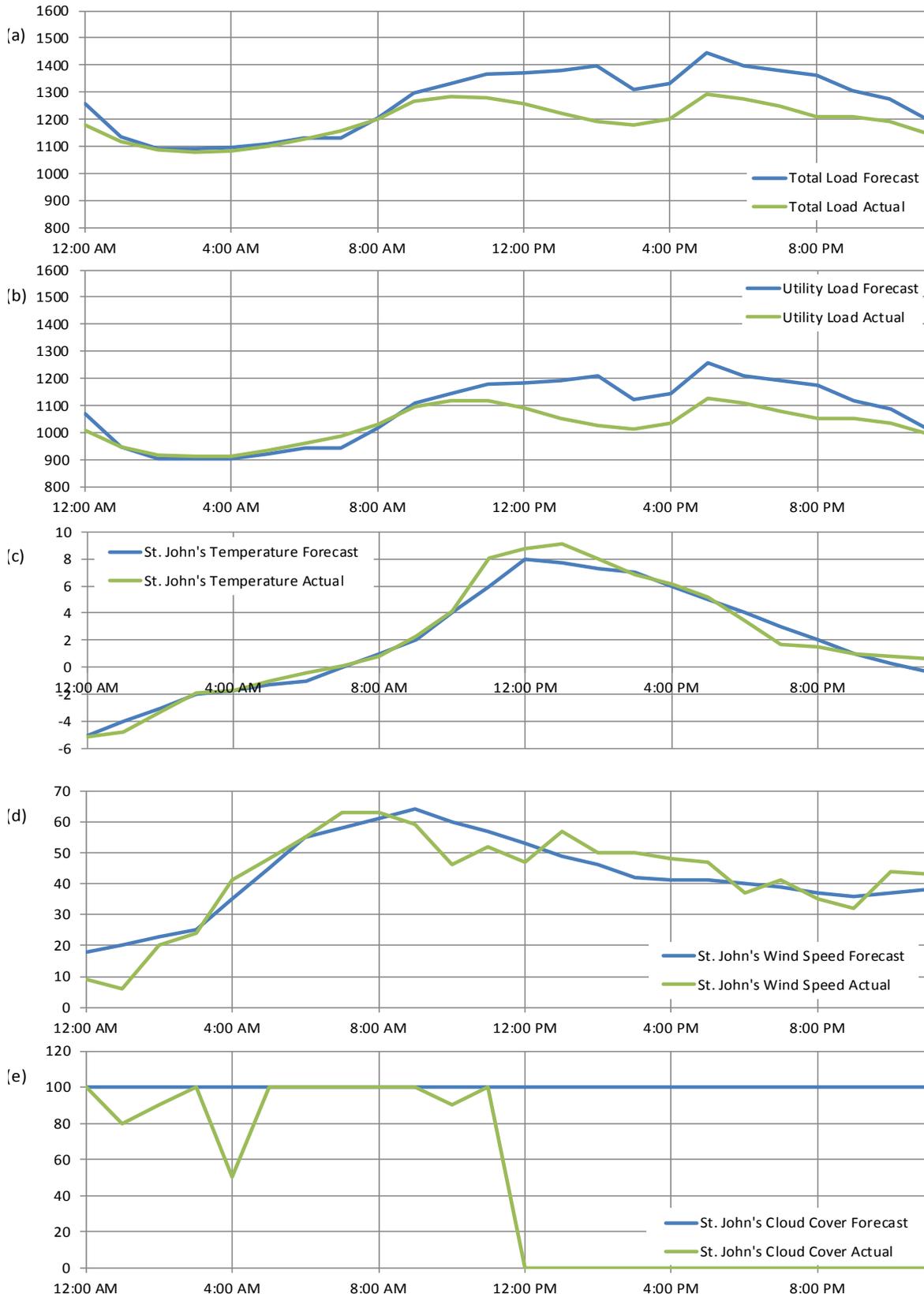


Figure 10 Accuracy Analysis - Jan 13, 2018

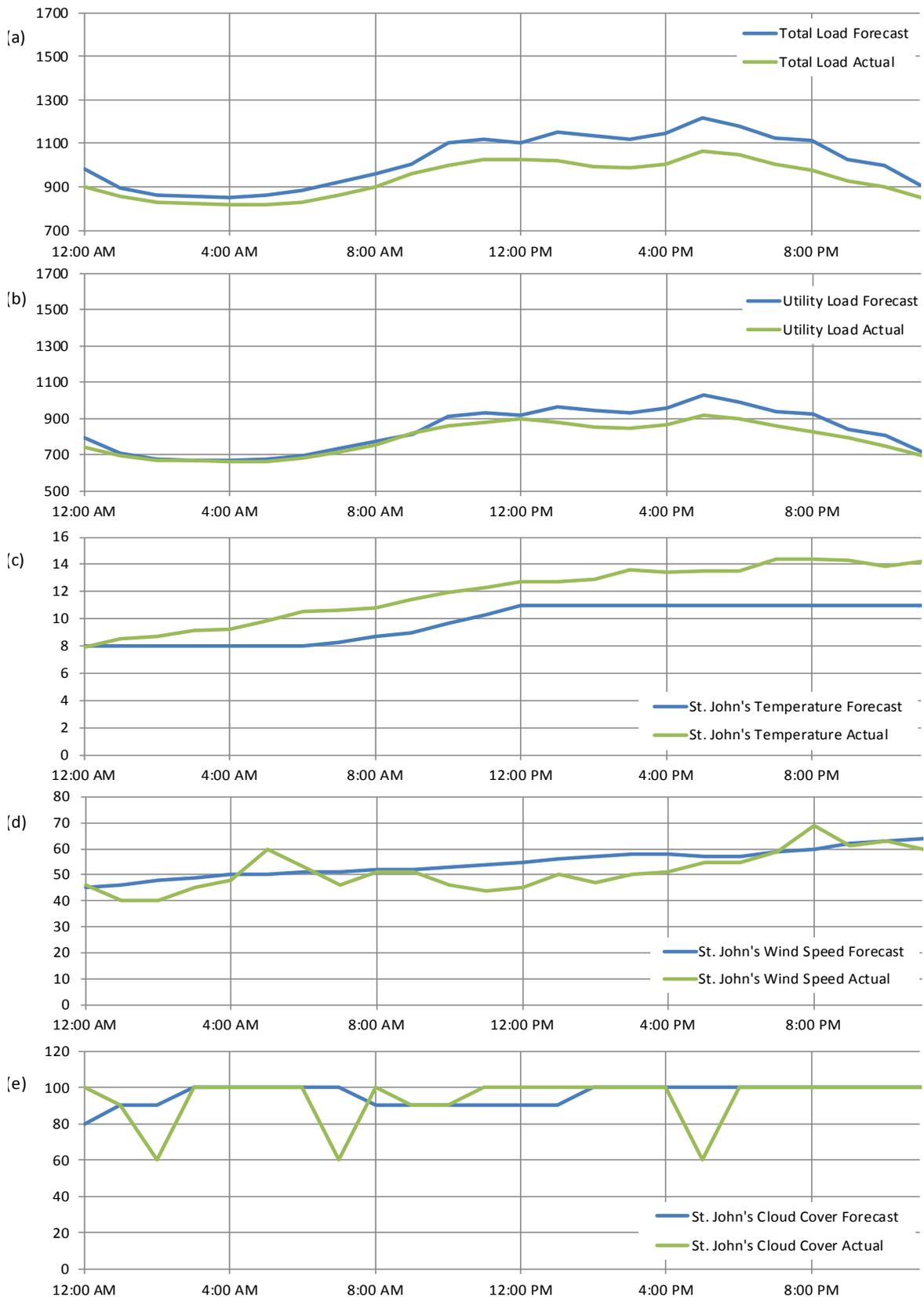


Figure 11 Accuracy Analysis - Jan 27, 2018

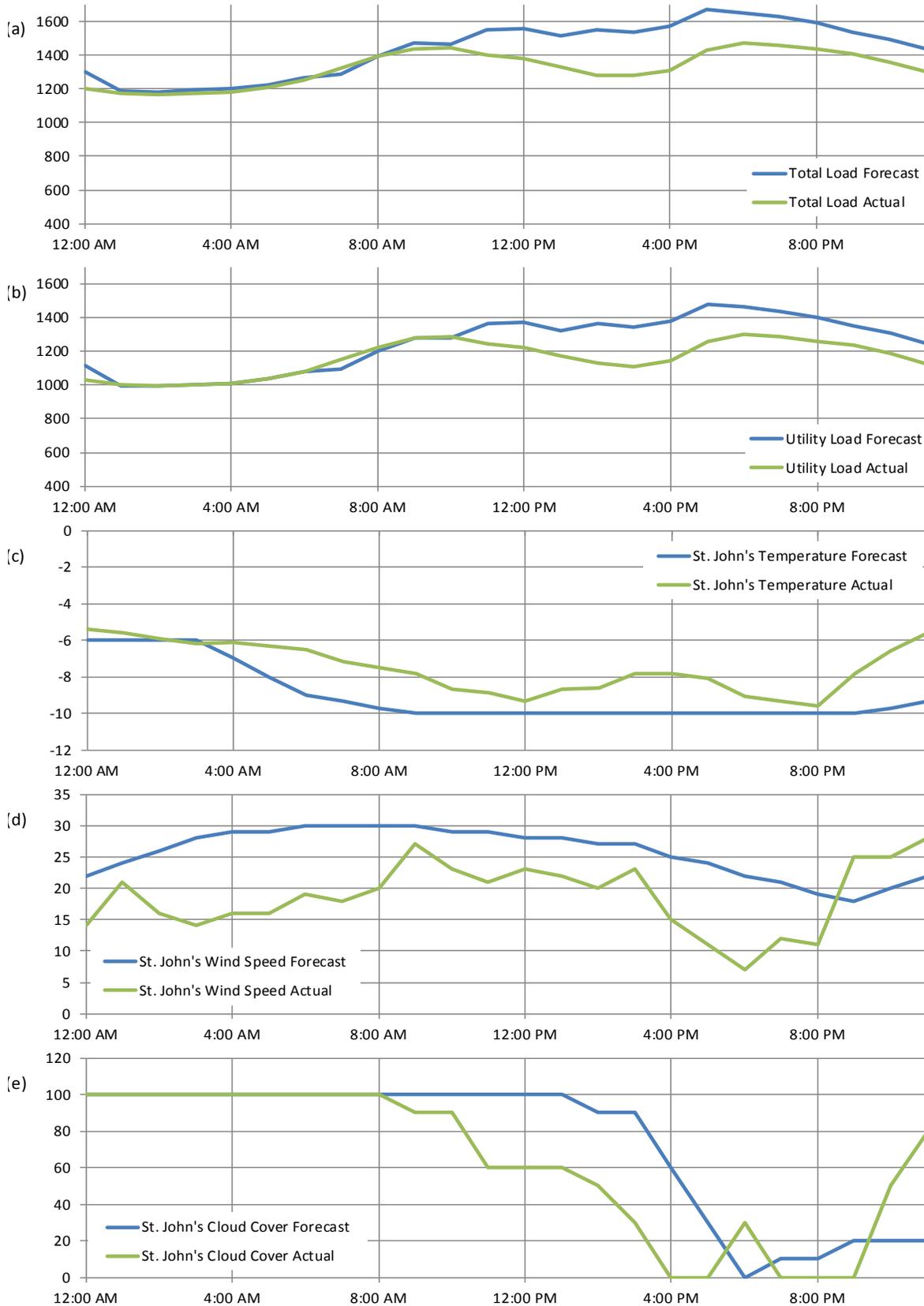


Figure 12 Accuracy Analysis - Jan 28, 2018

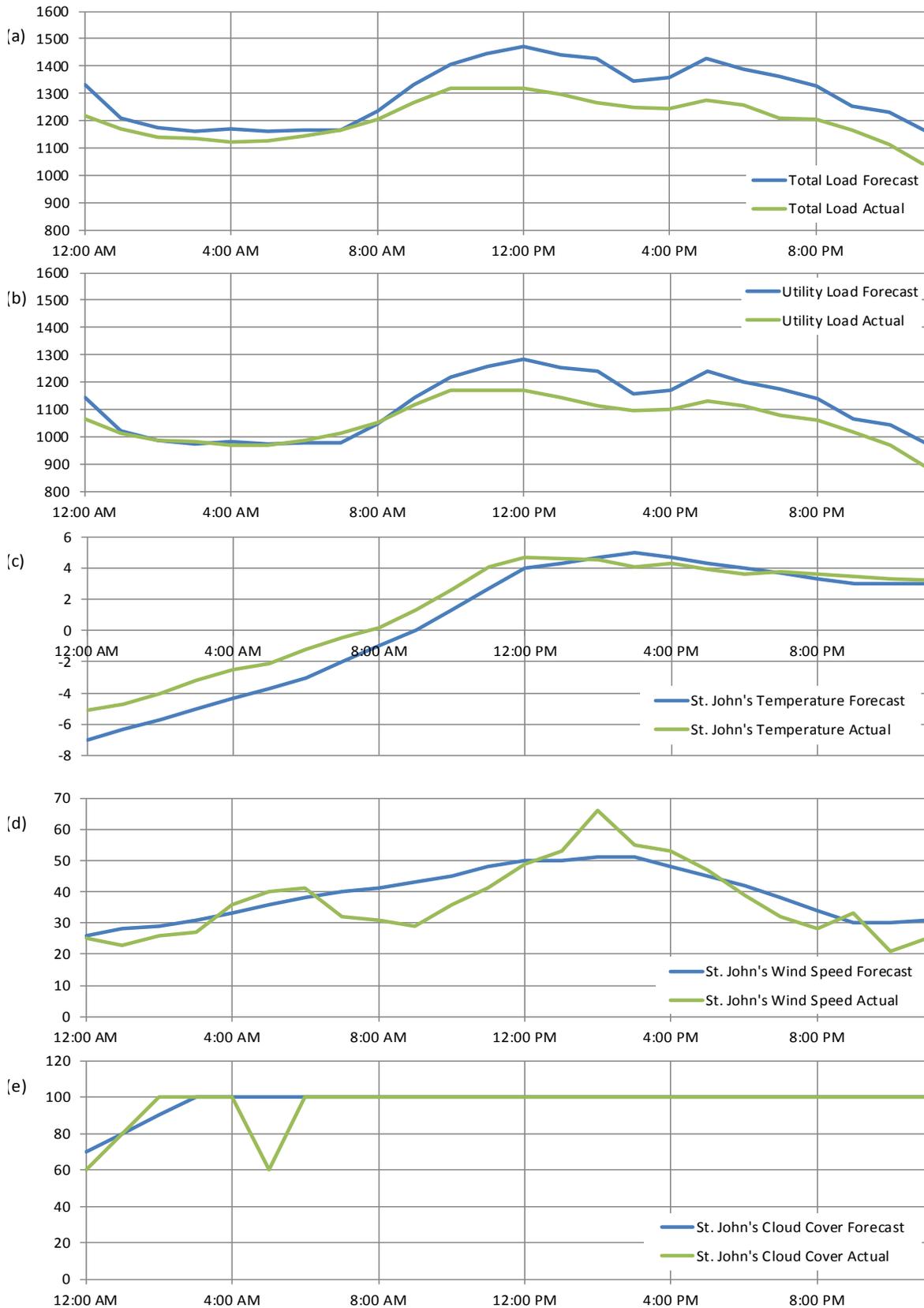


Figure 13 Accuracy Analysis - Feb 11, 2018

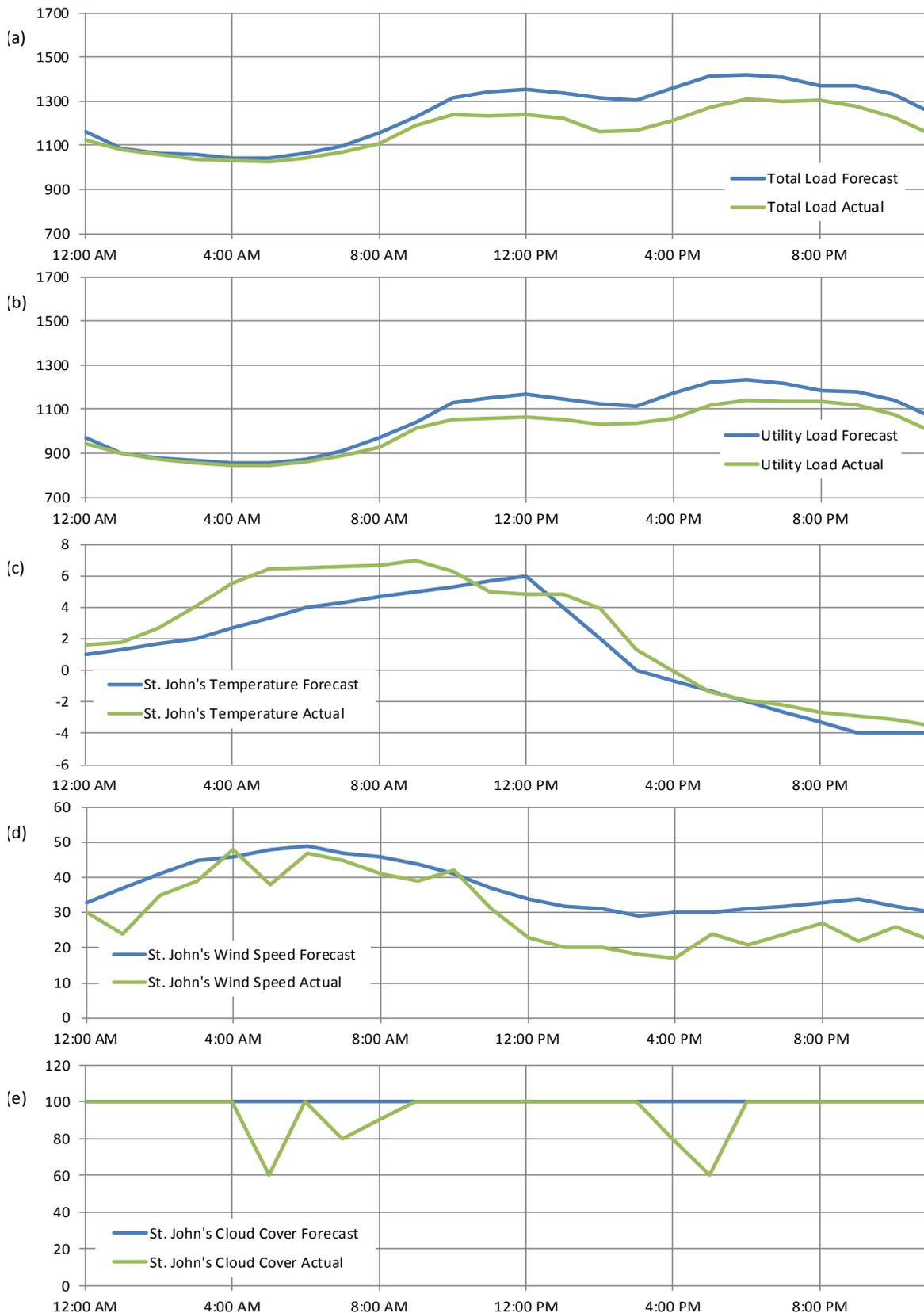


Figure 14 Accuracy Analysis - Feb 13, 2018

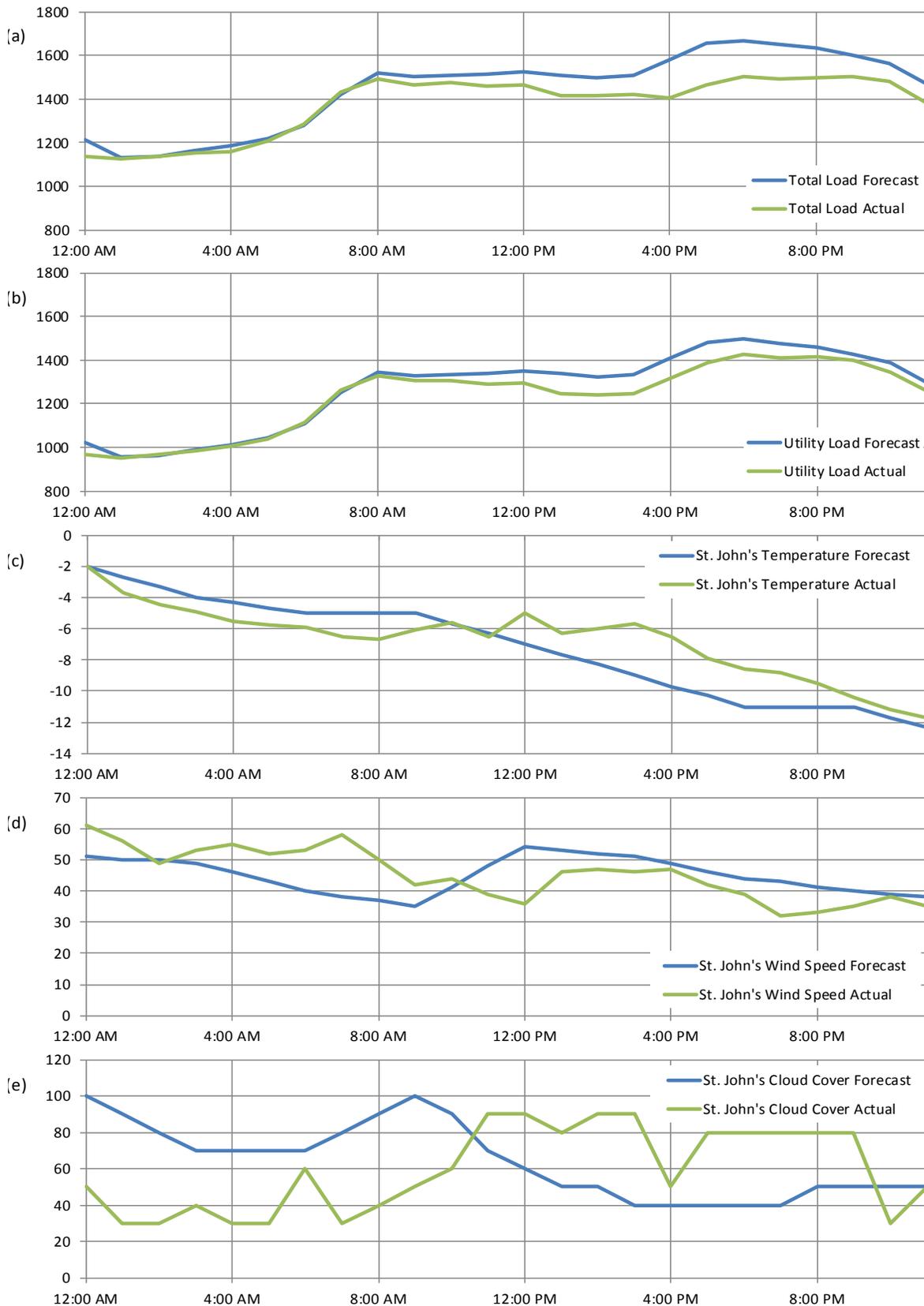


Figure 15 Accuracy Analysis - Feb 20, 2018

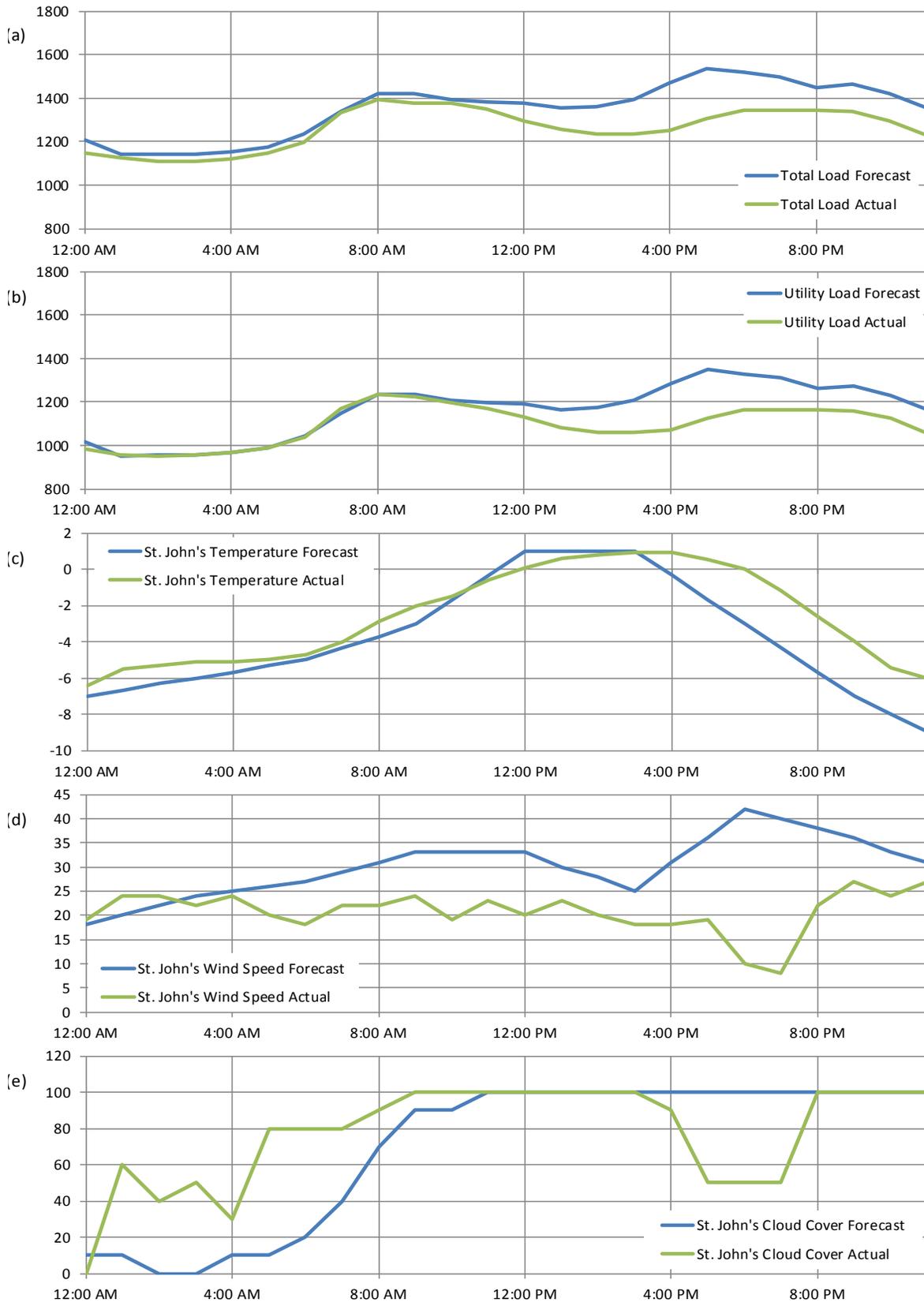


Figure 16 Accuracy Analysis - Mar 23, 2018

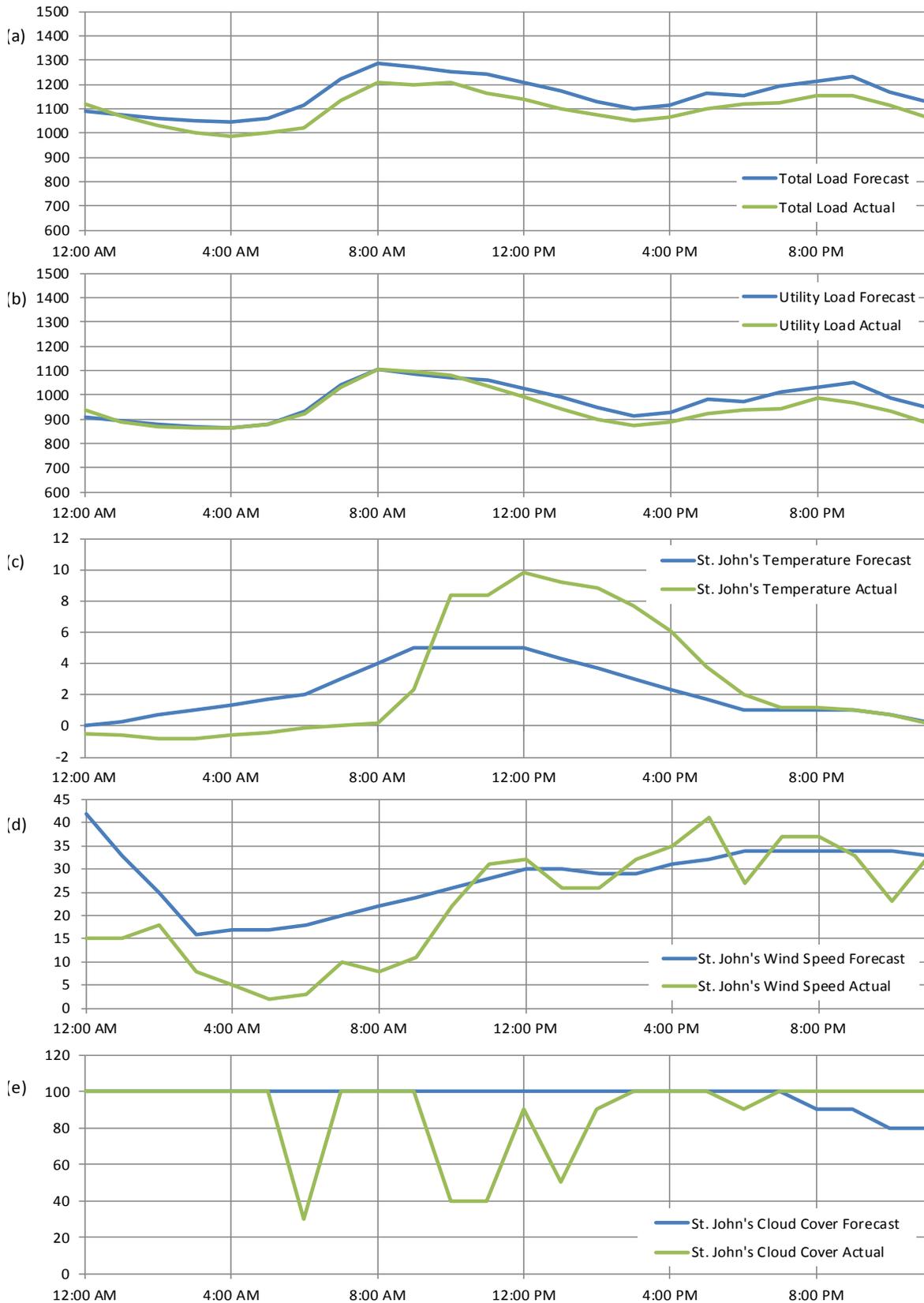


Figure 17 Accuracy Analysis - Mar 30, 2018

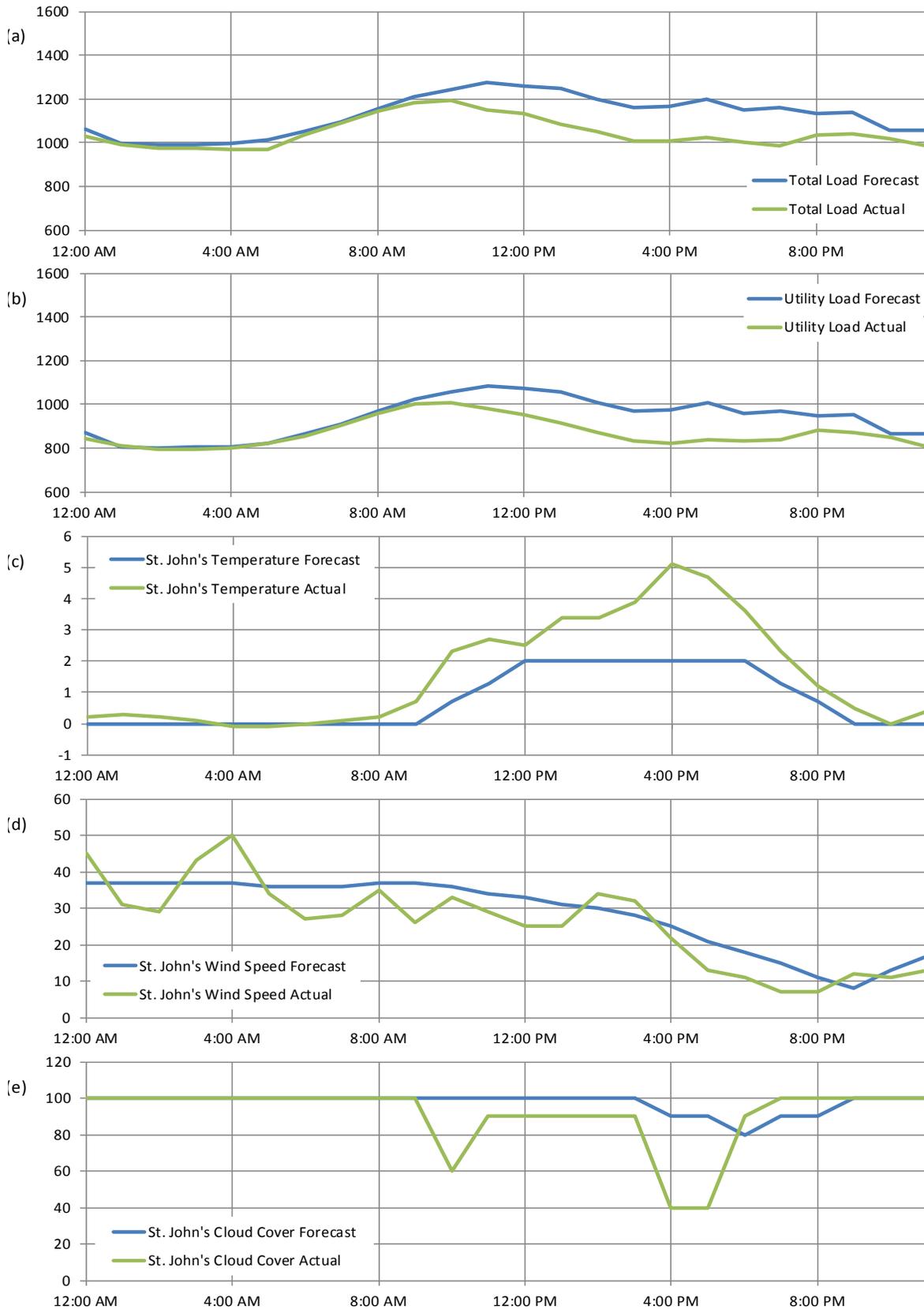


Figure 18 Accuracy Analysis - Apr 02, 2018

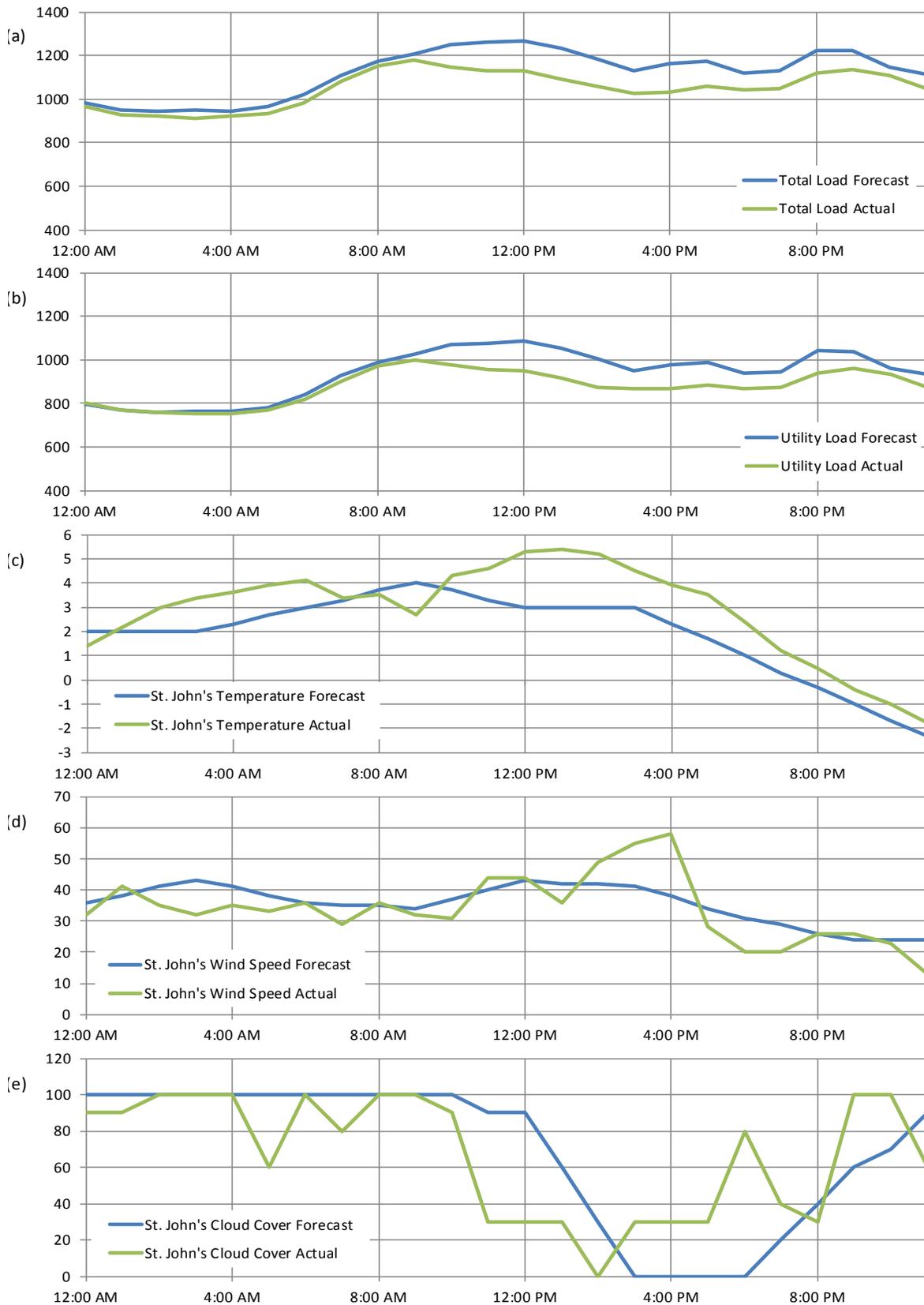


Figure 19 Accuracy Analysis - Apr 21, 2018

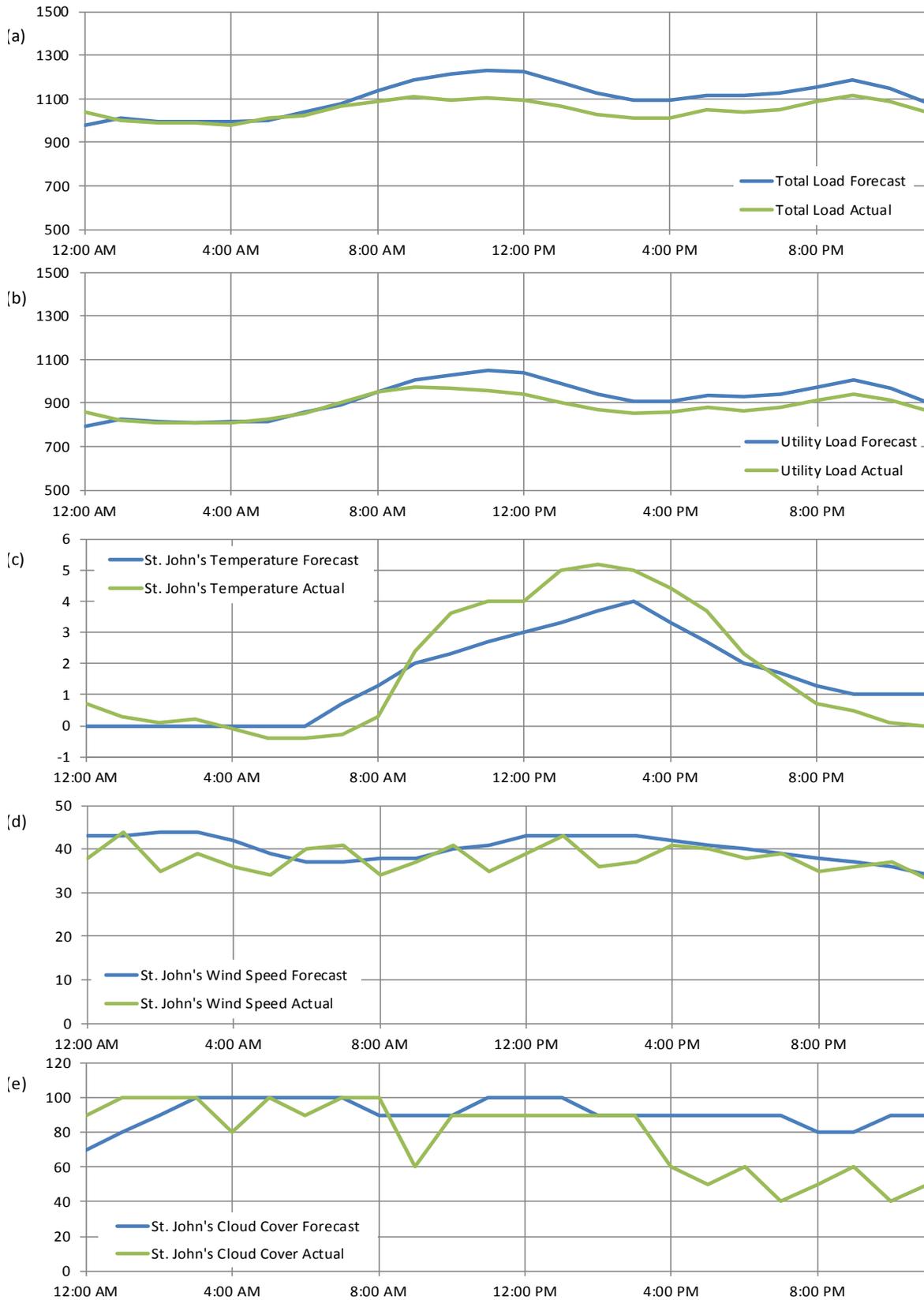


Figure 20 Accuracy Analysis - Apr 22, 2018

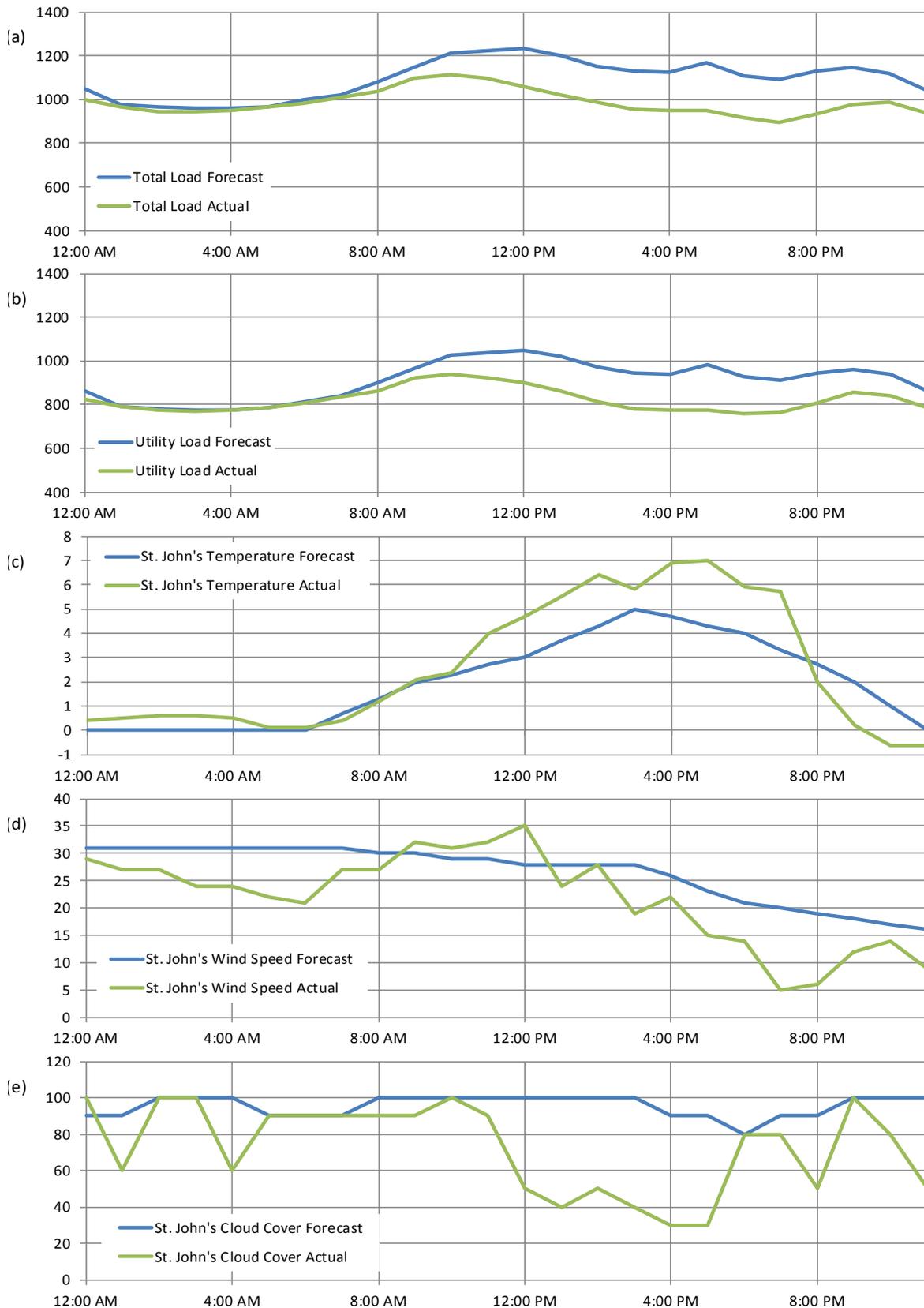


Figure 21 Accuracy Analysis - May 06, 2018

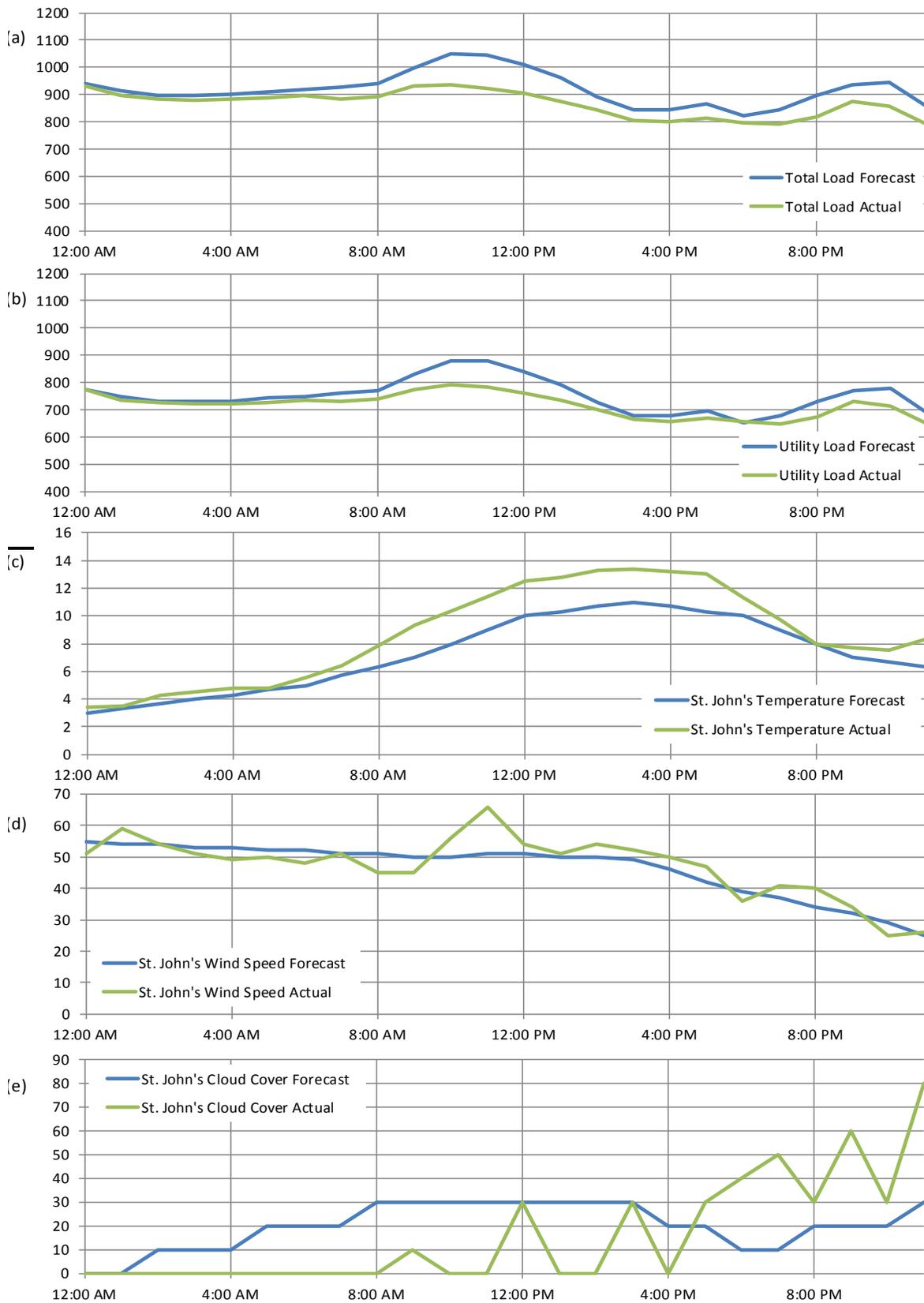


Figure 22 Accuracy Analysis - May 16, 2018

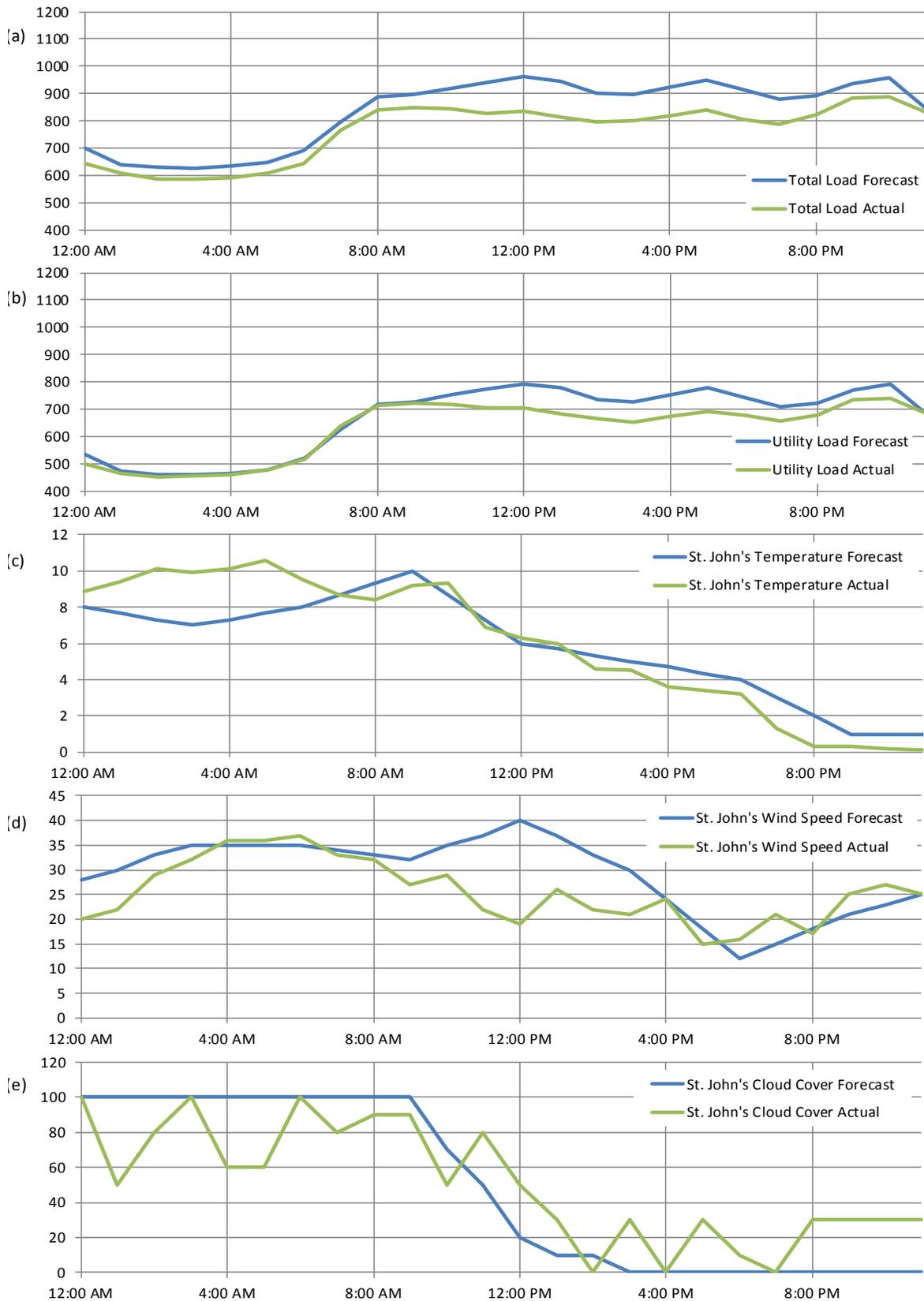


Figure 23 Accuracy Analysis - May 19, 2018

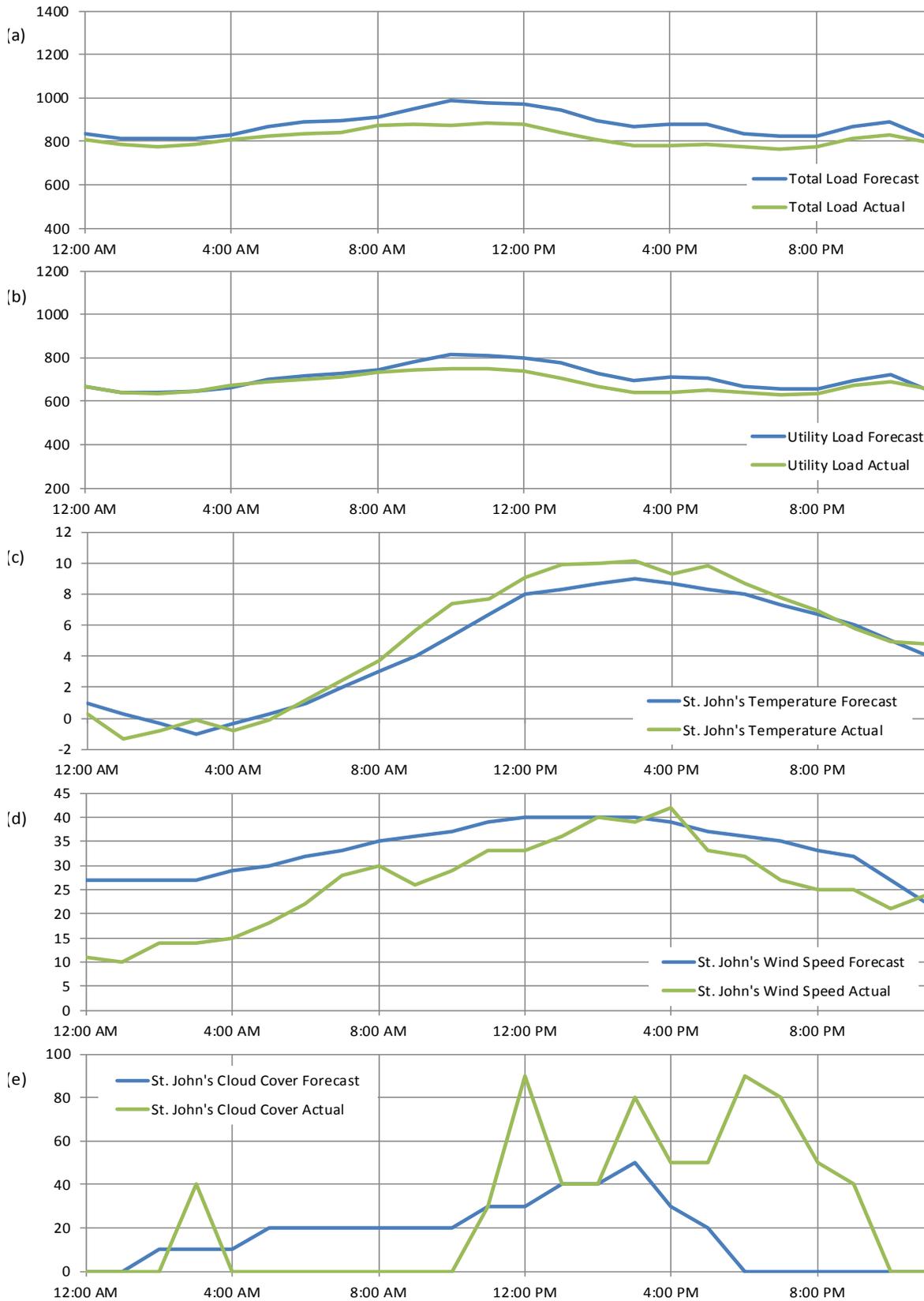


Figure 24 Accuracy Analysis - Jun 10, 2018

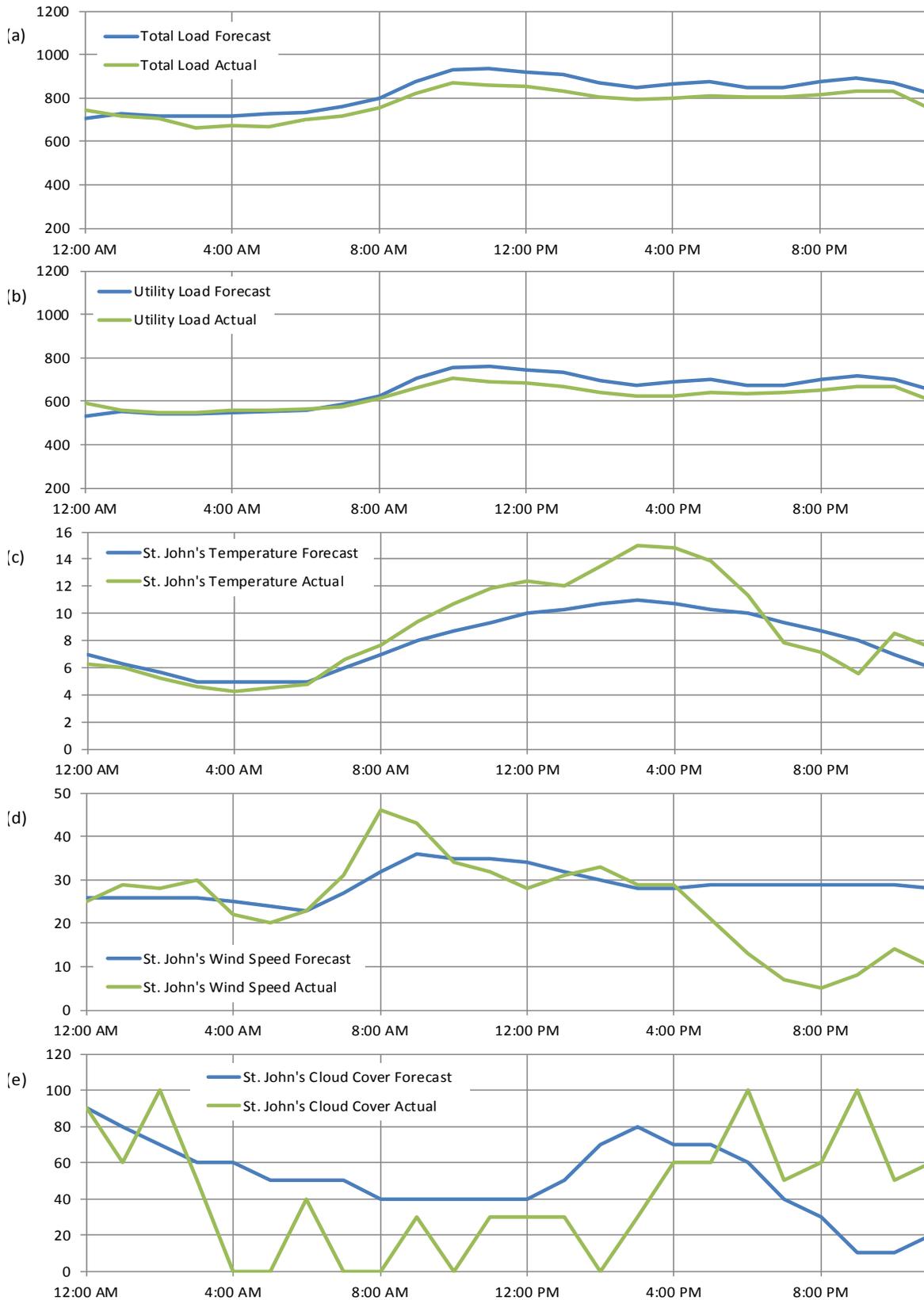


Figure 25 Accuracy Analysis - Jun 16, 2018

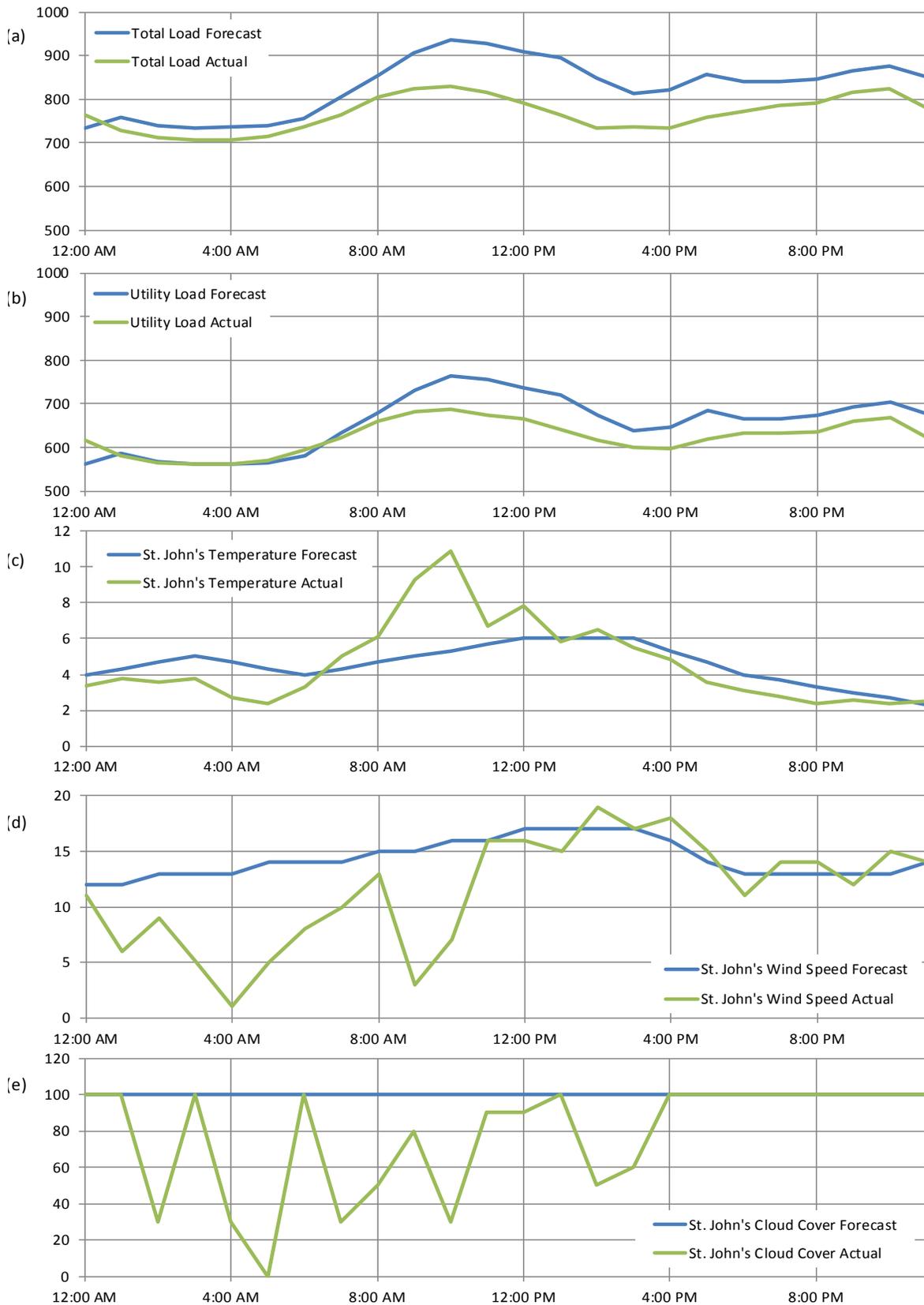


Figure 26 Accuracy Analysis - Jun 27, 2018

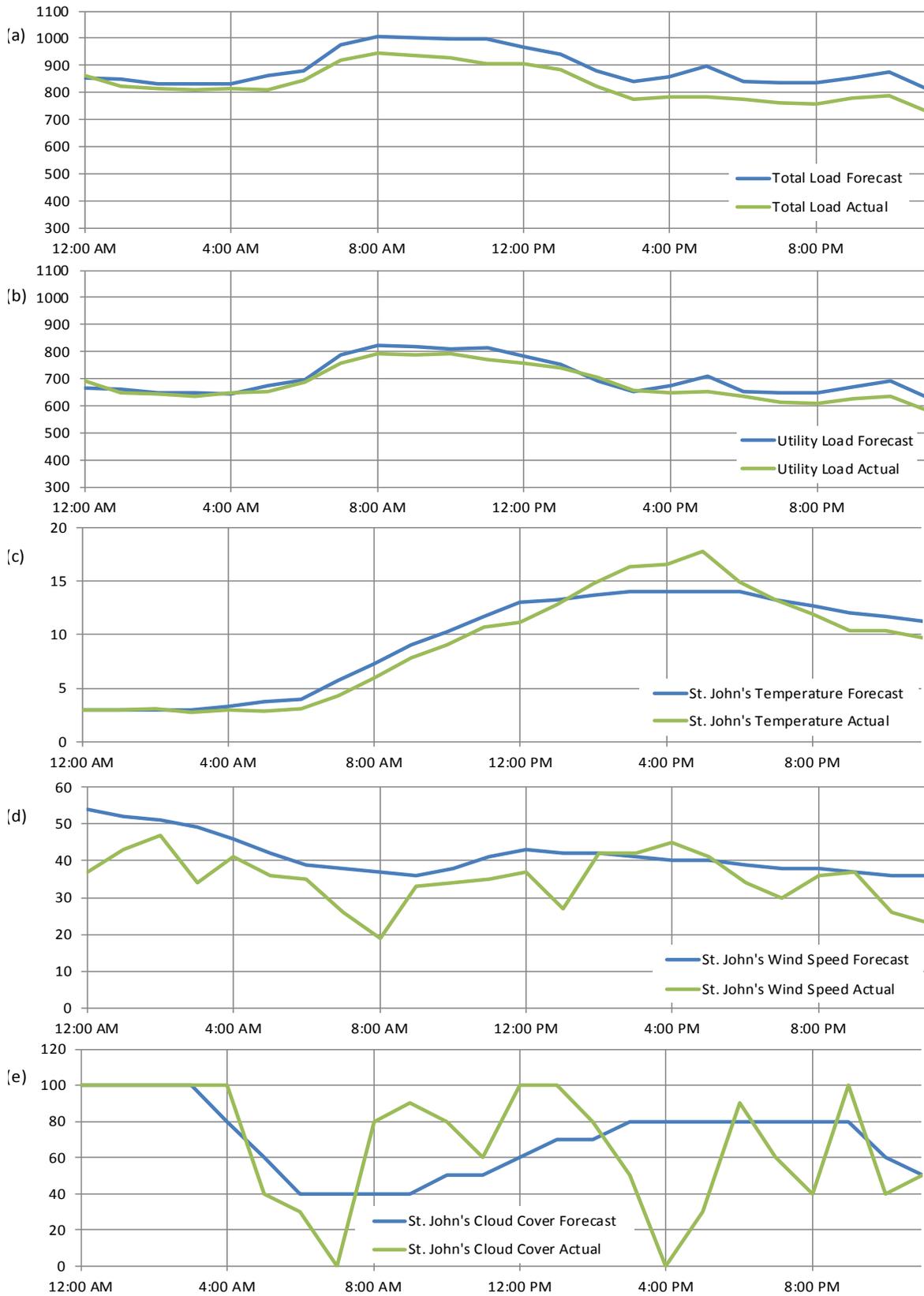


Figure 27 Accuracy Analysis - Jul 02, 2018

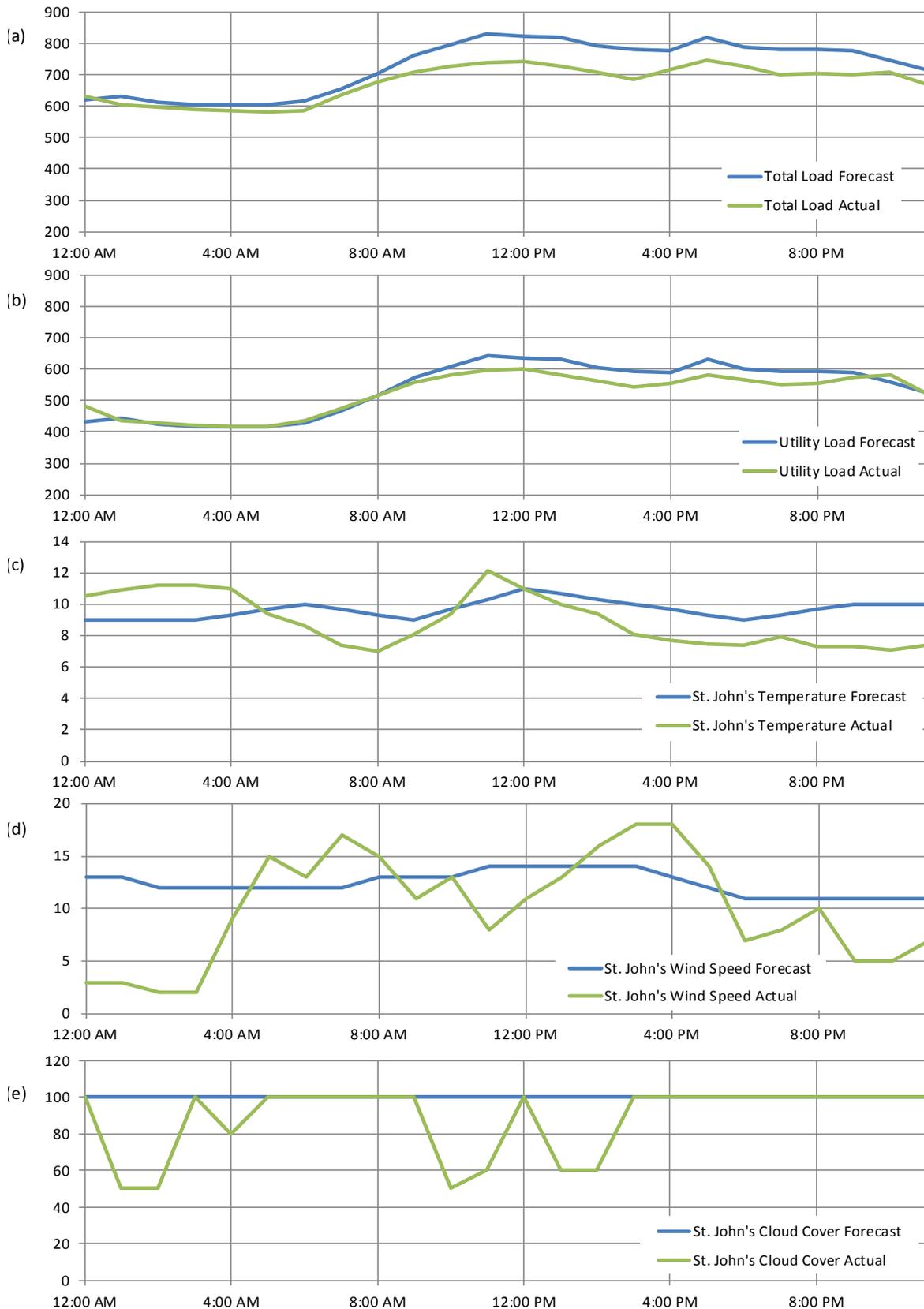


Figure 28 Accuracy Analysis - Jul 05, 2018

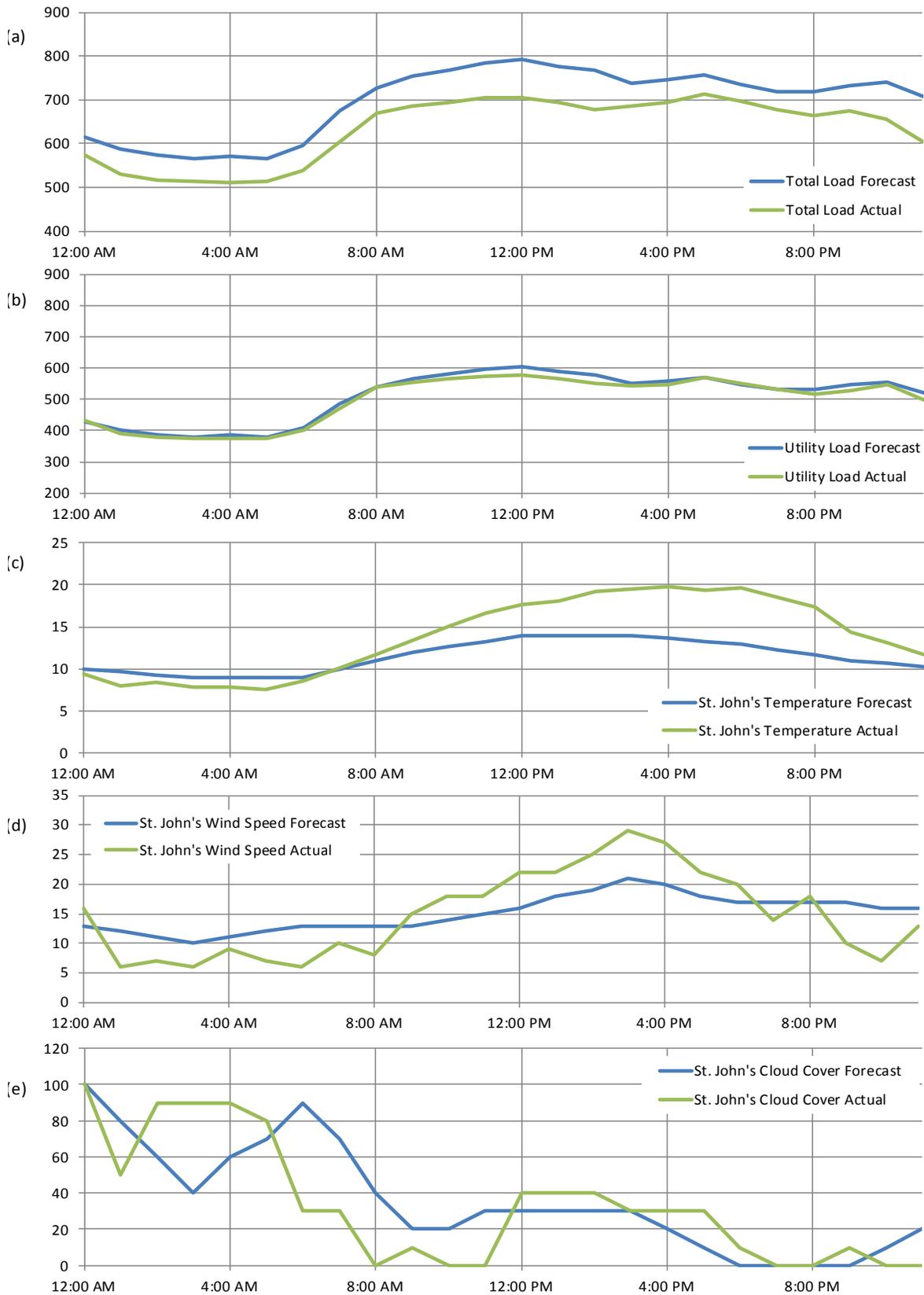


Figure 29 Accuracy Analysis - Jul 11, 2018

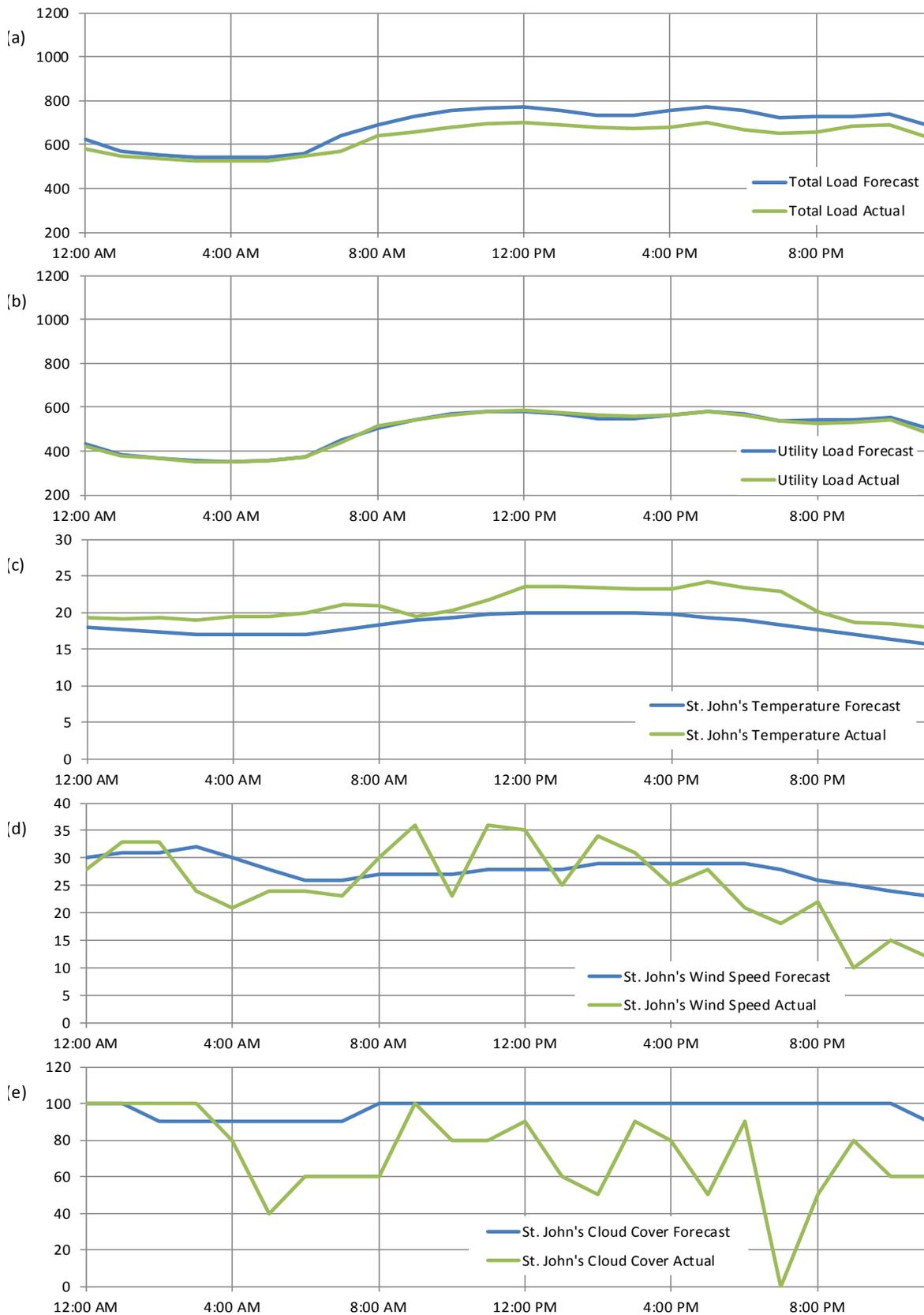


Figure 30 Accuracy Analysis - Aug 09, 2018

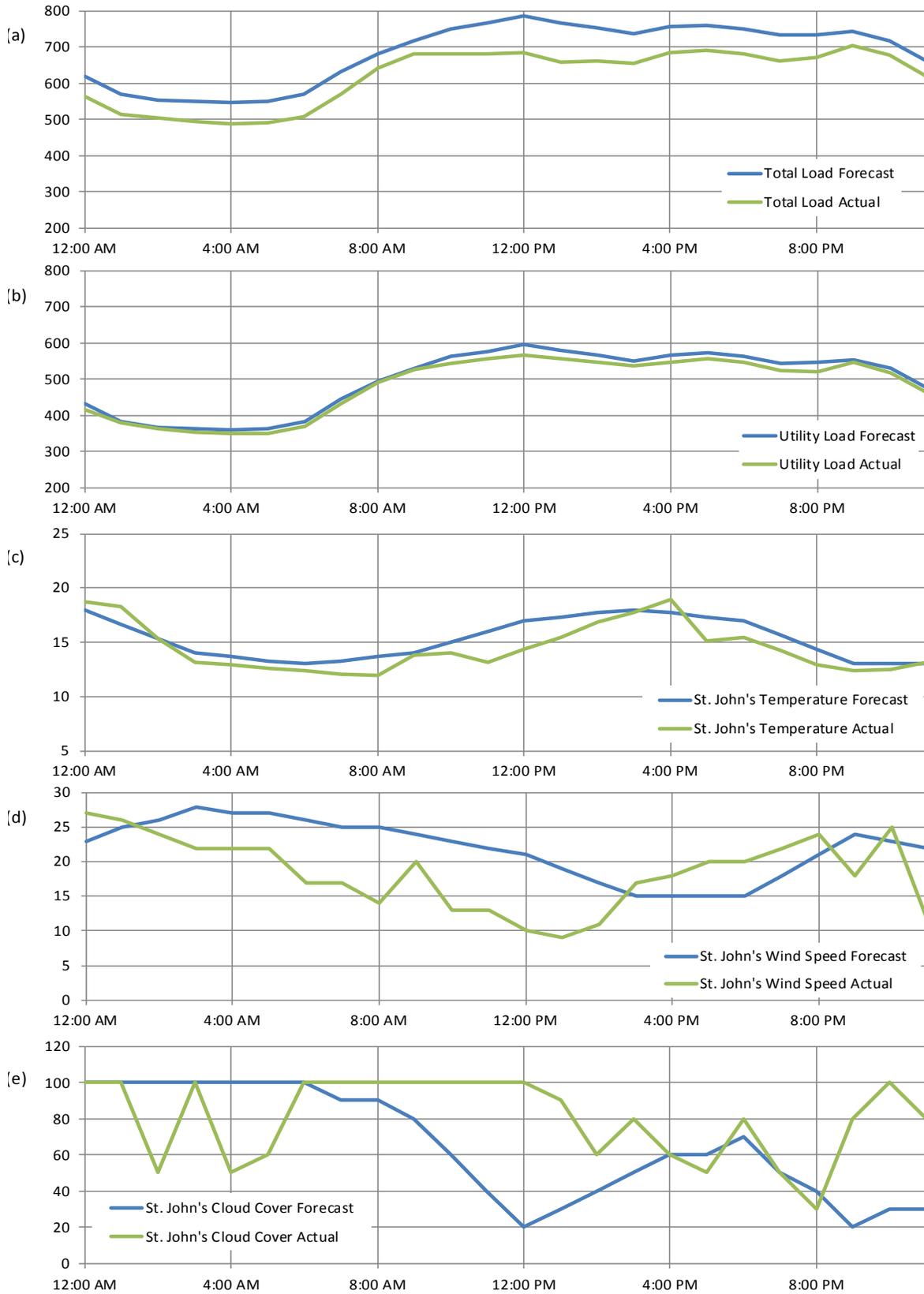


Figure 31 Accuracy Analysis - Aug 17, 2018

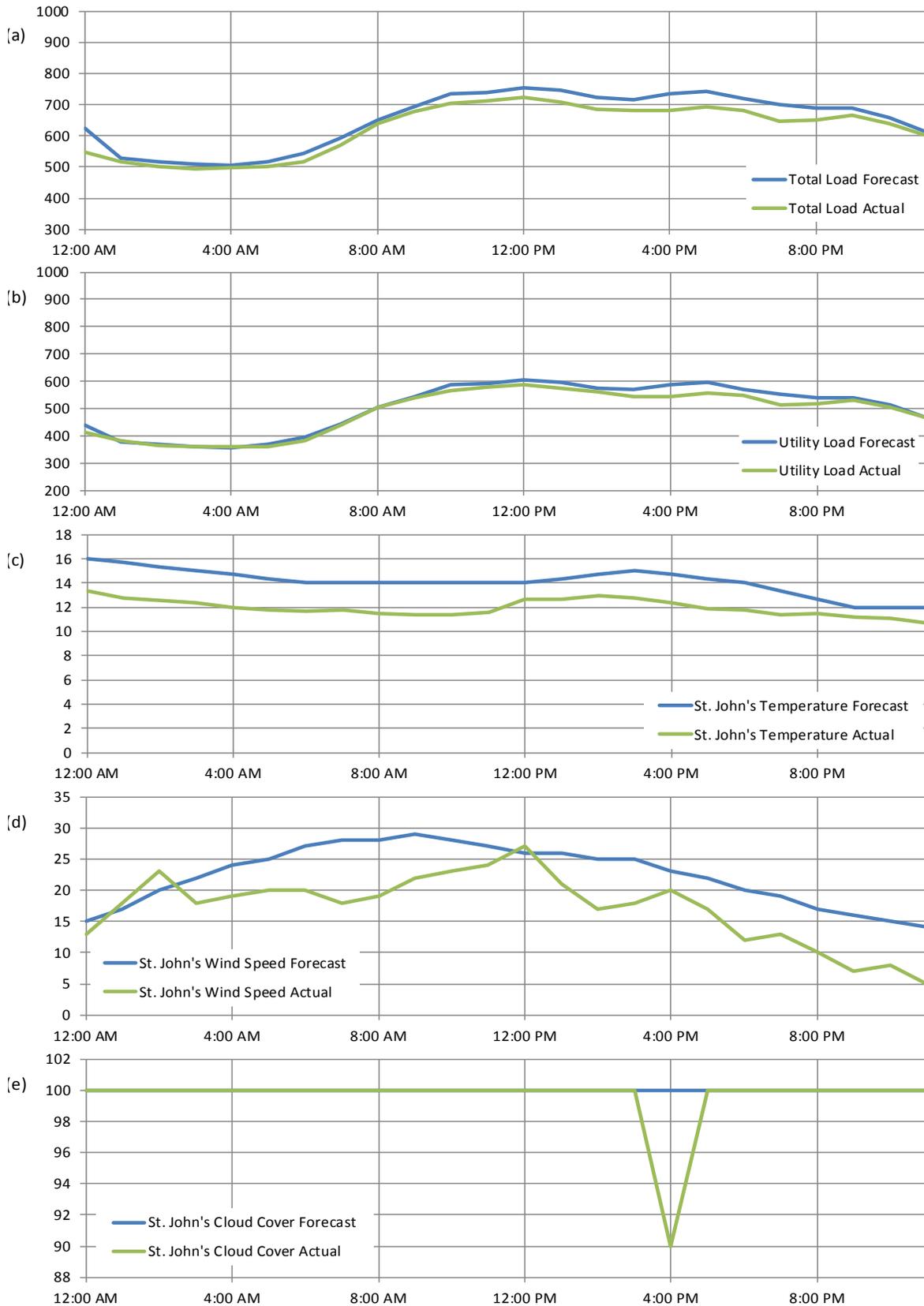


Figure 32 Accuracy Analysis - Aug 21, 2018

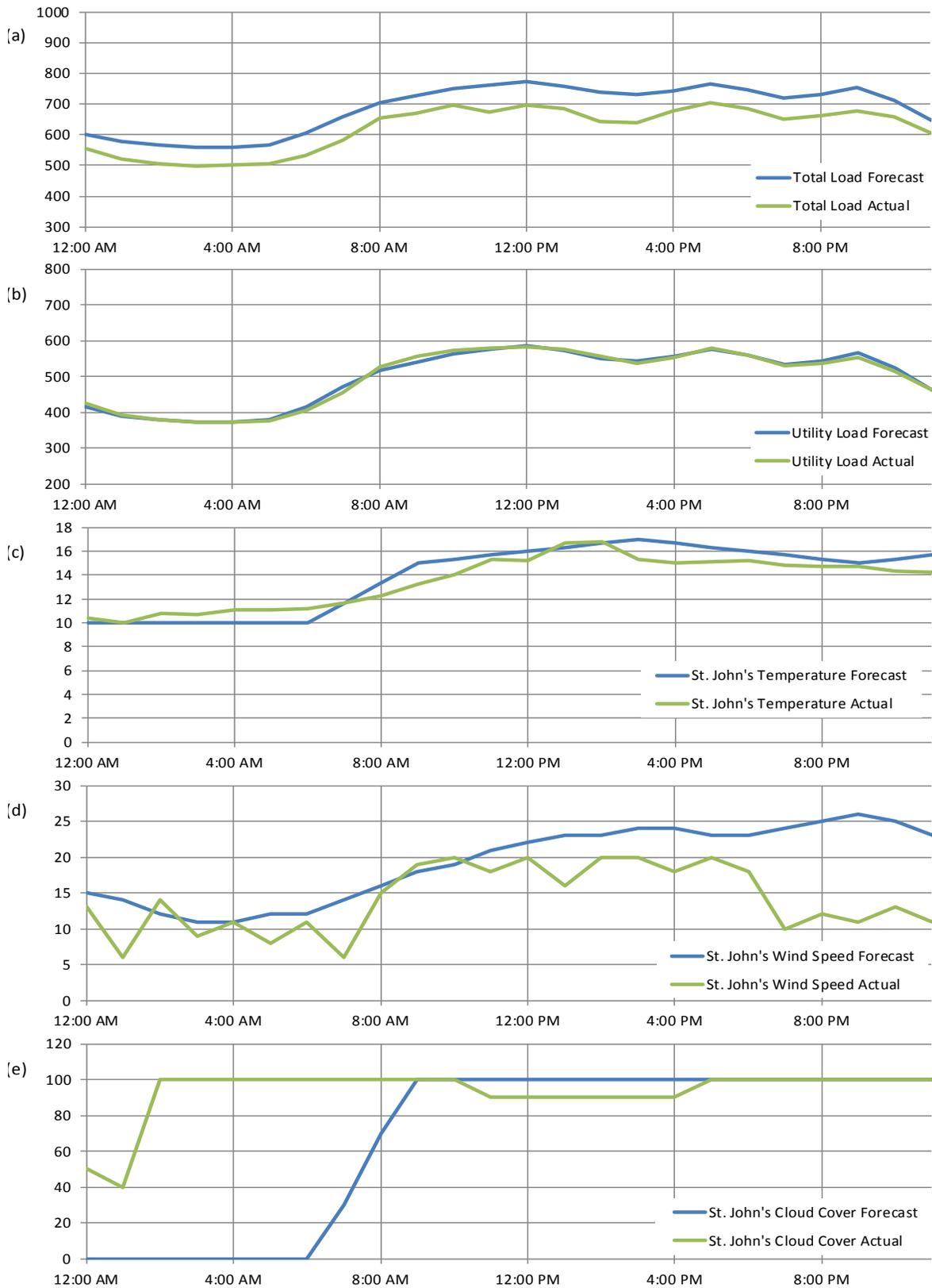


Figure 33 Accuracy Analysis - Sep 03, 2018

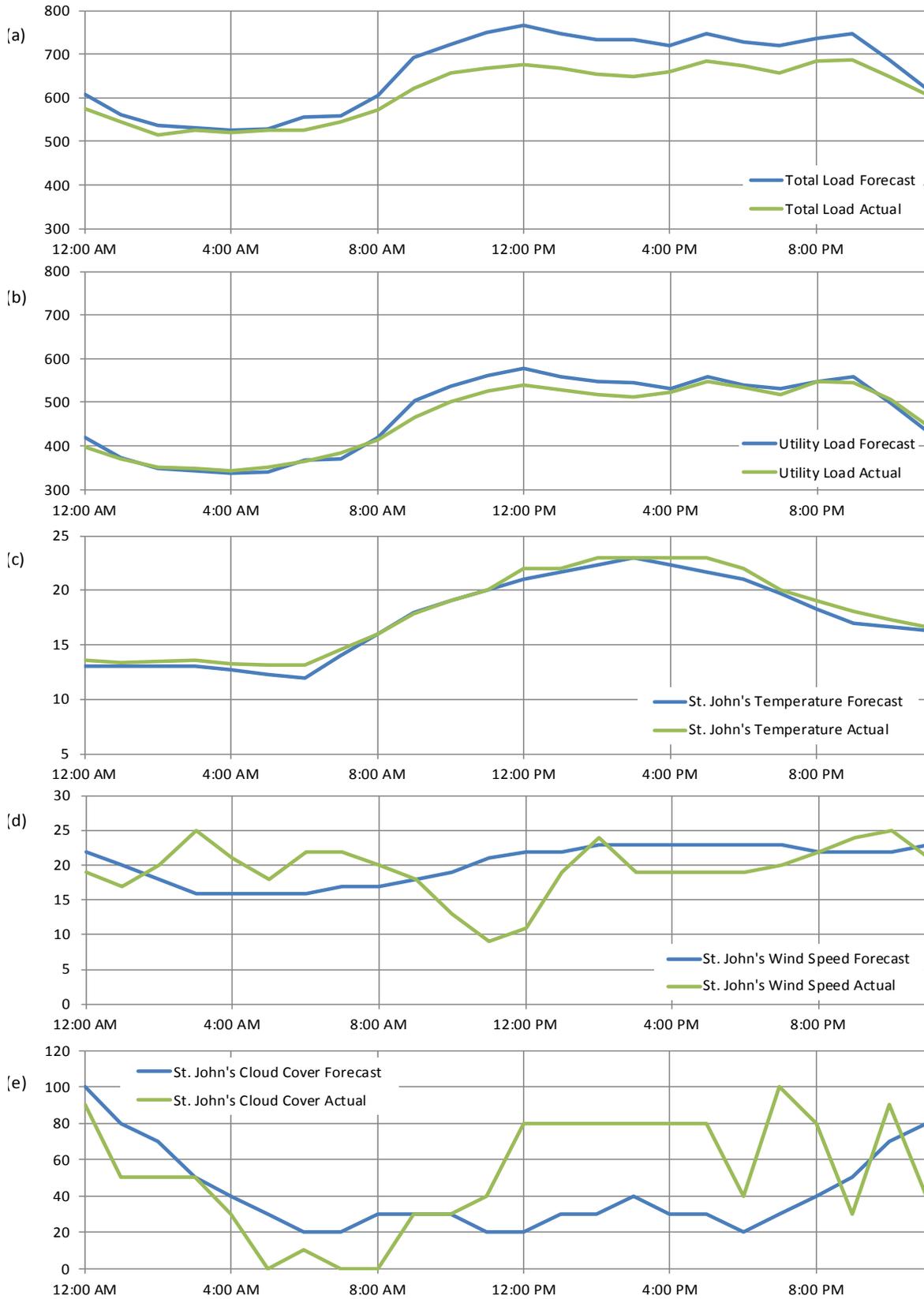


Figure 34 Accuracy Analysis - Sep 07, 2018

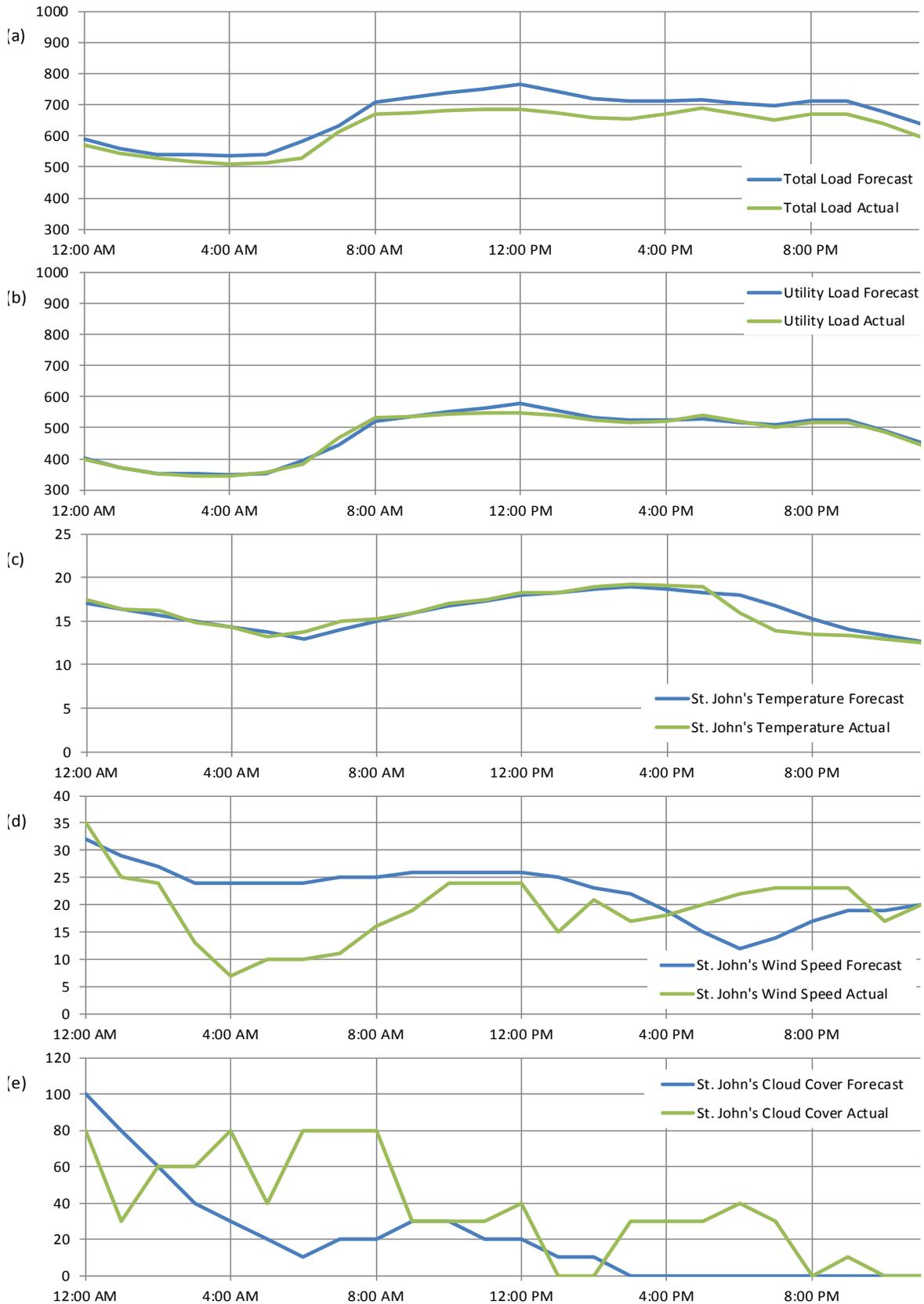


Figure 35 Accuracy Analysis - Sep 08, 2018

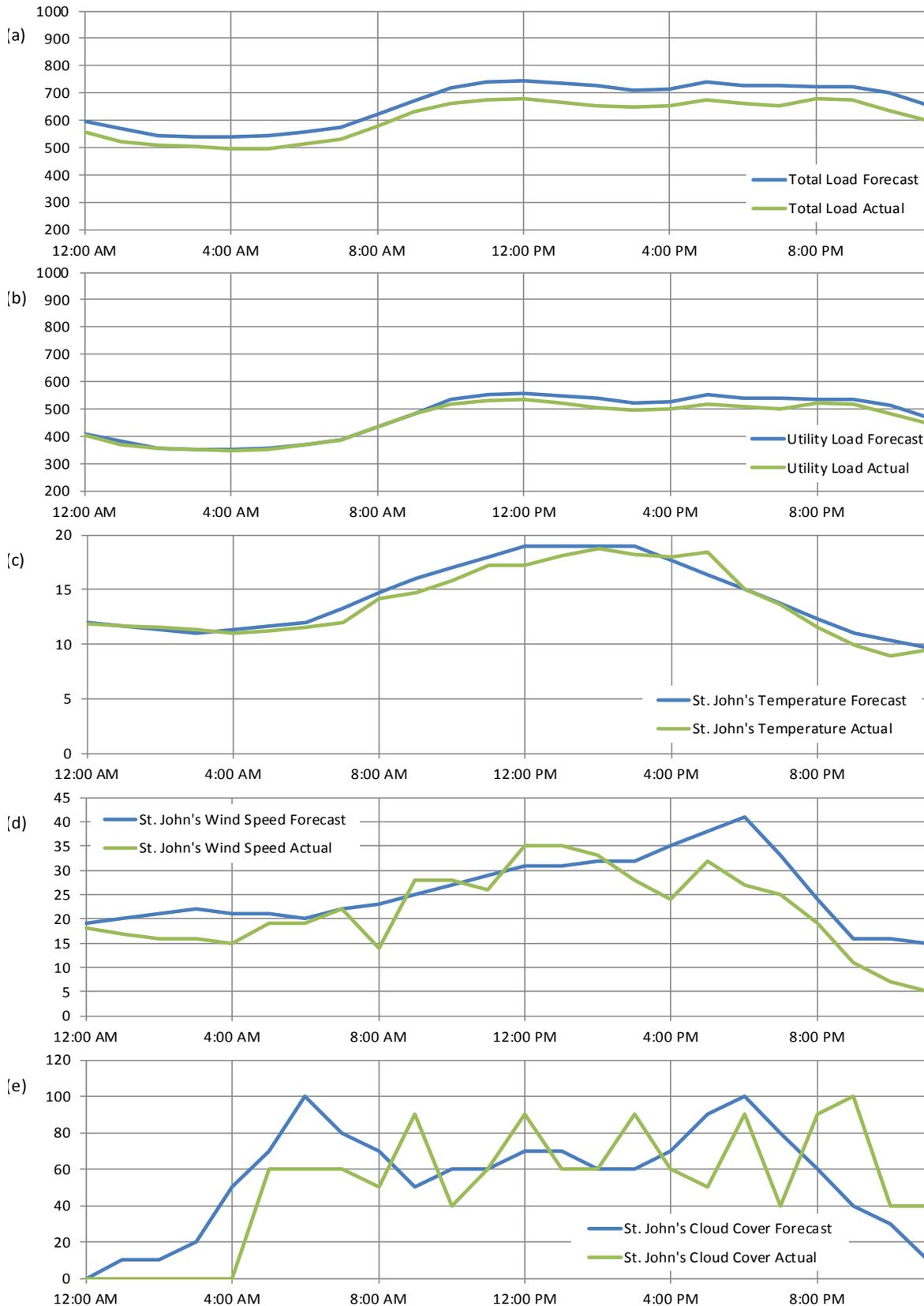


Figure 36 Accuracy Analysis - Oct 05, 2018

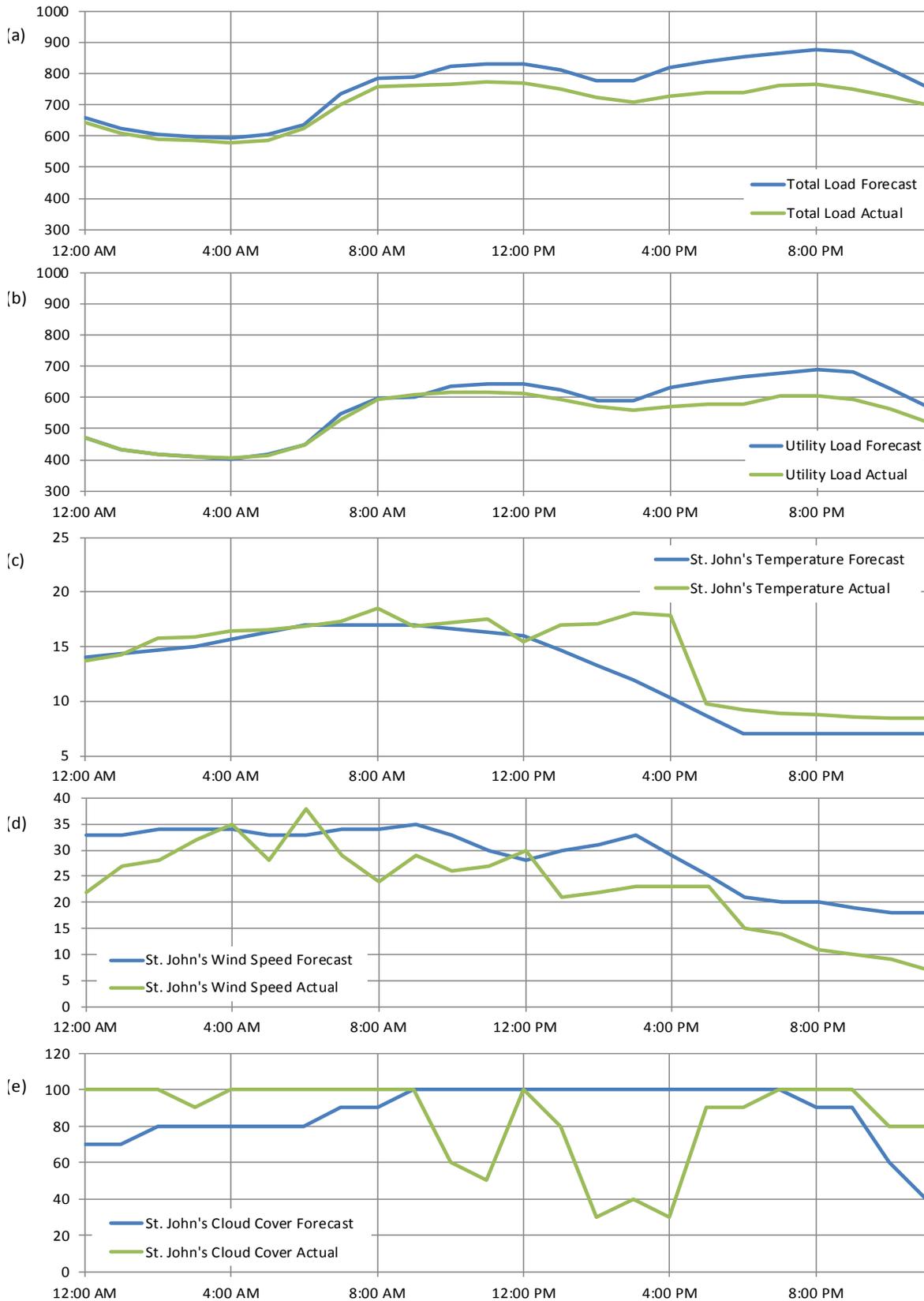


Figure 37 Accuracy Analysis - Oct 30, 2018

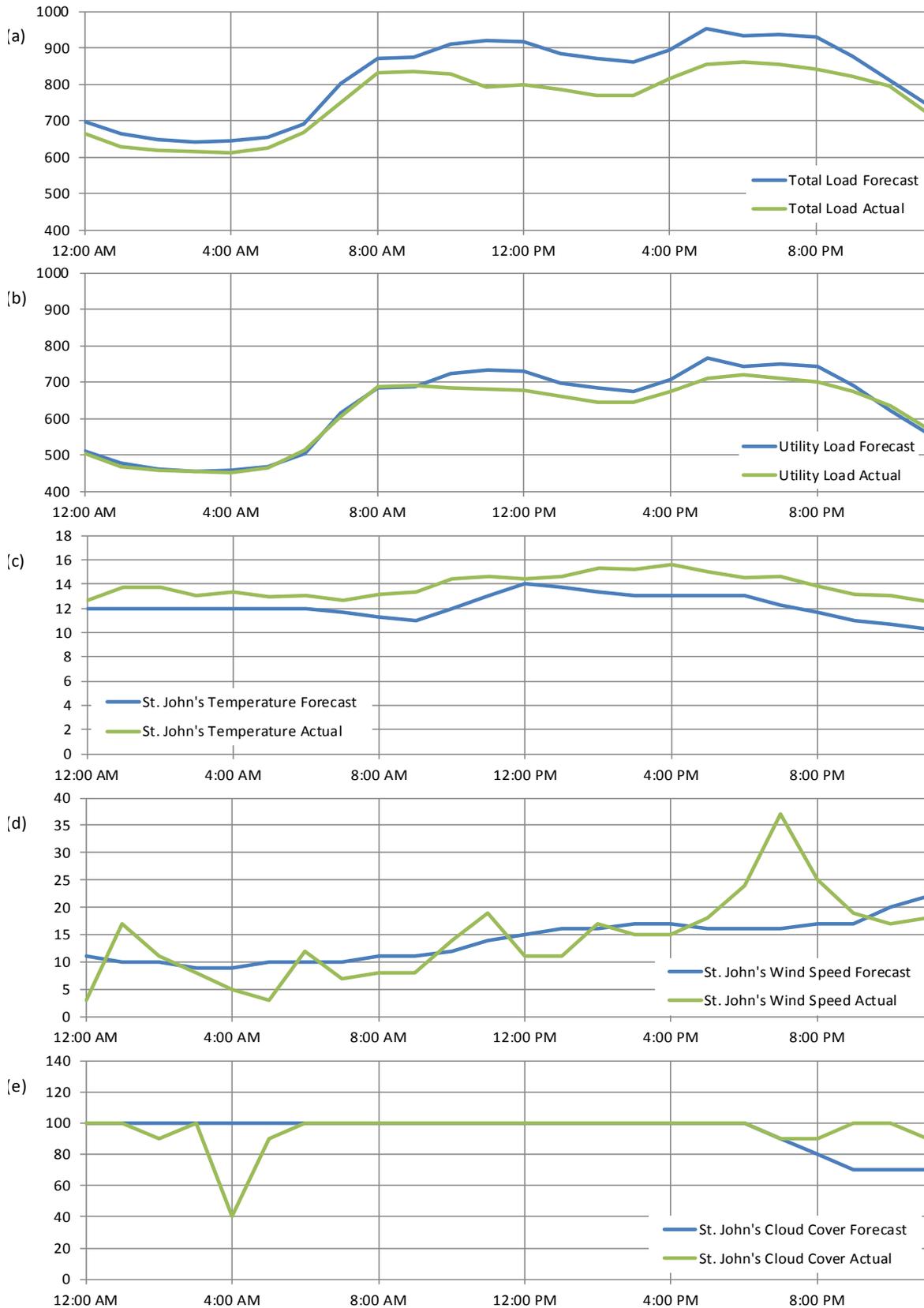


Figure 38 Accuracy Analysis - Oct 31, 2018

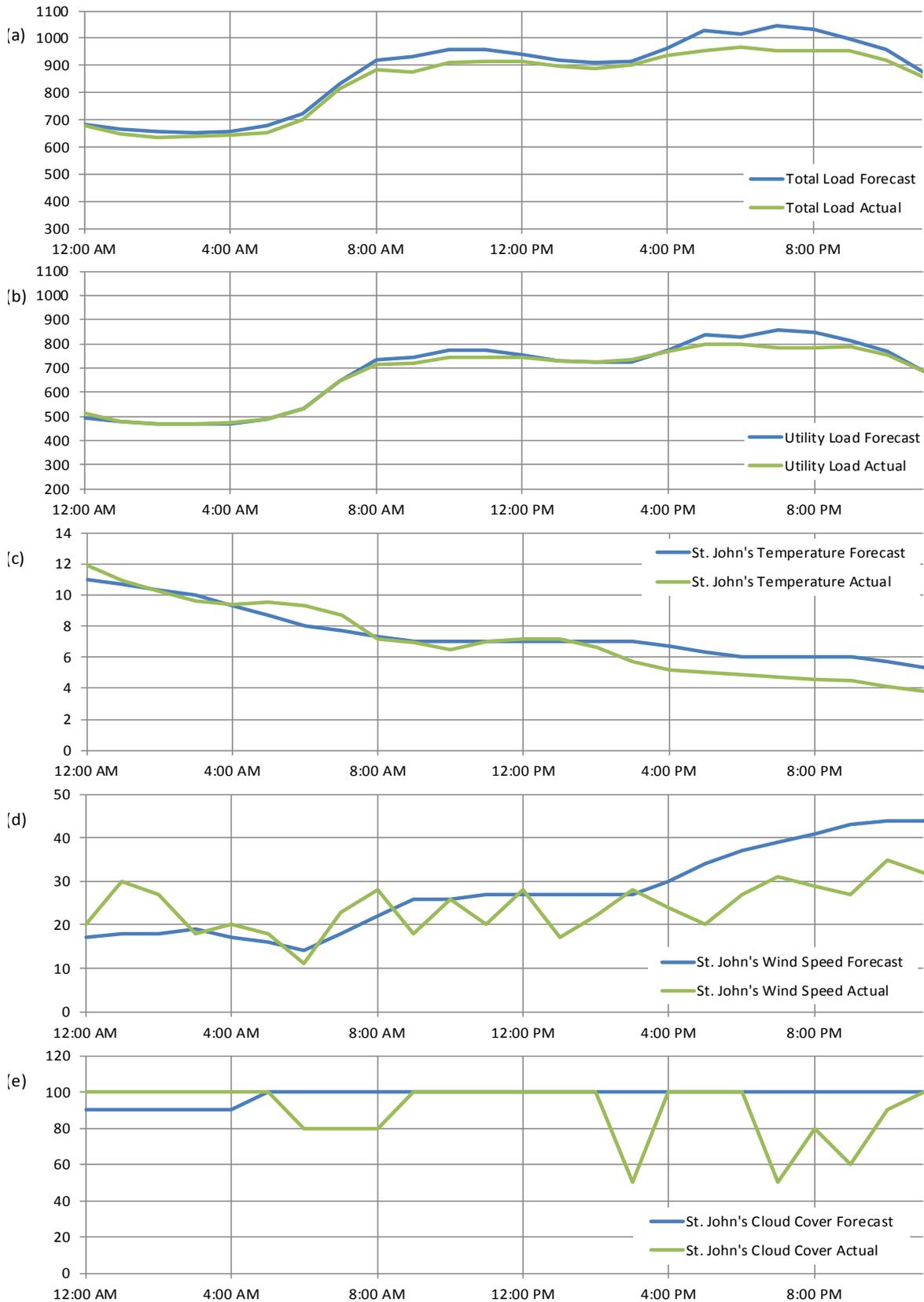


Figure 39 Accuracy Analysis - Nov 06, 2018

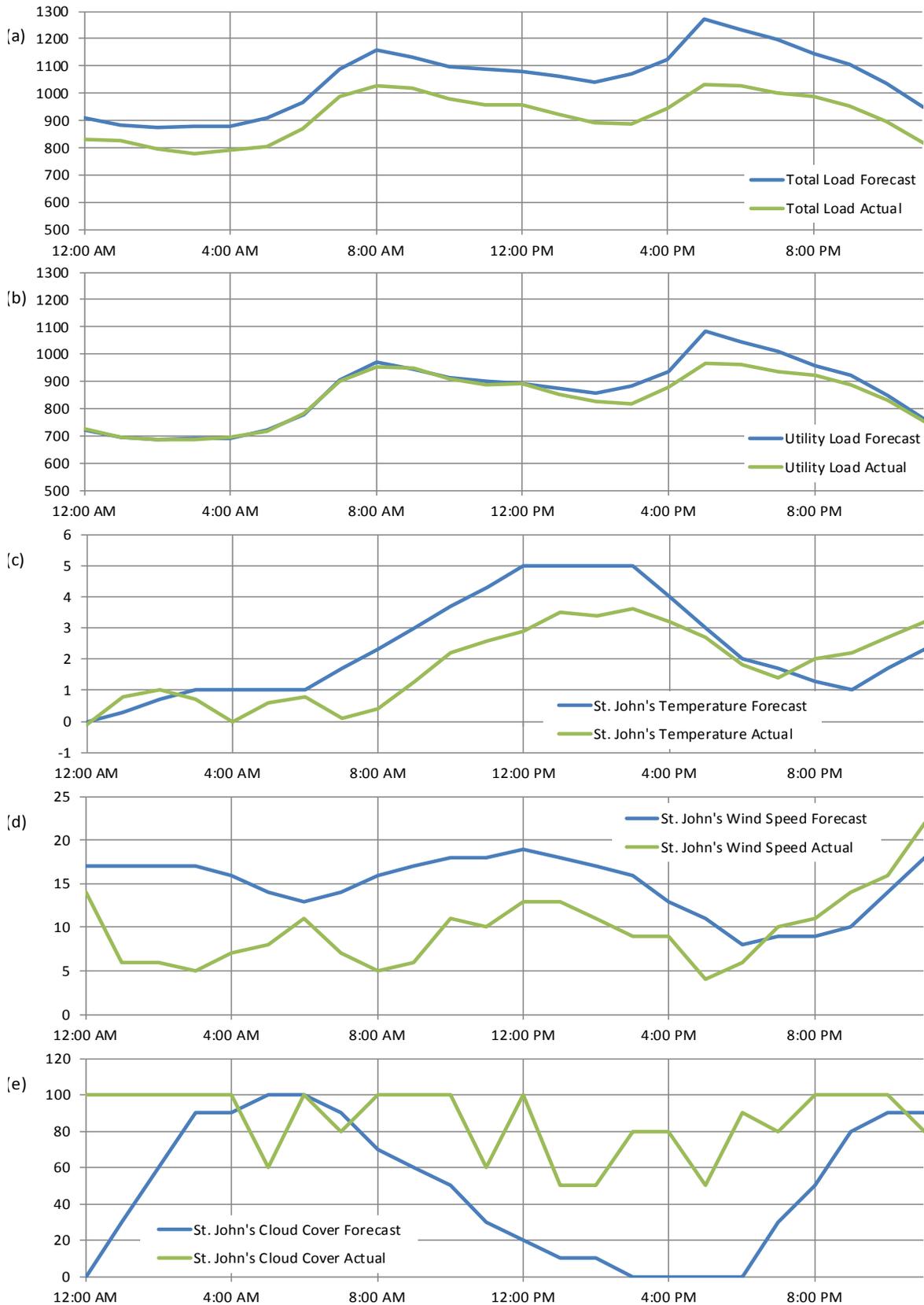


Figure 40 Accuracy Analysis - Nov 07, 2018

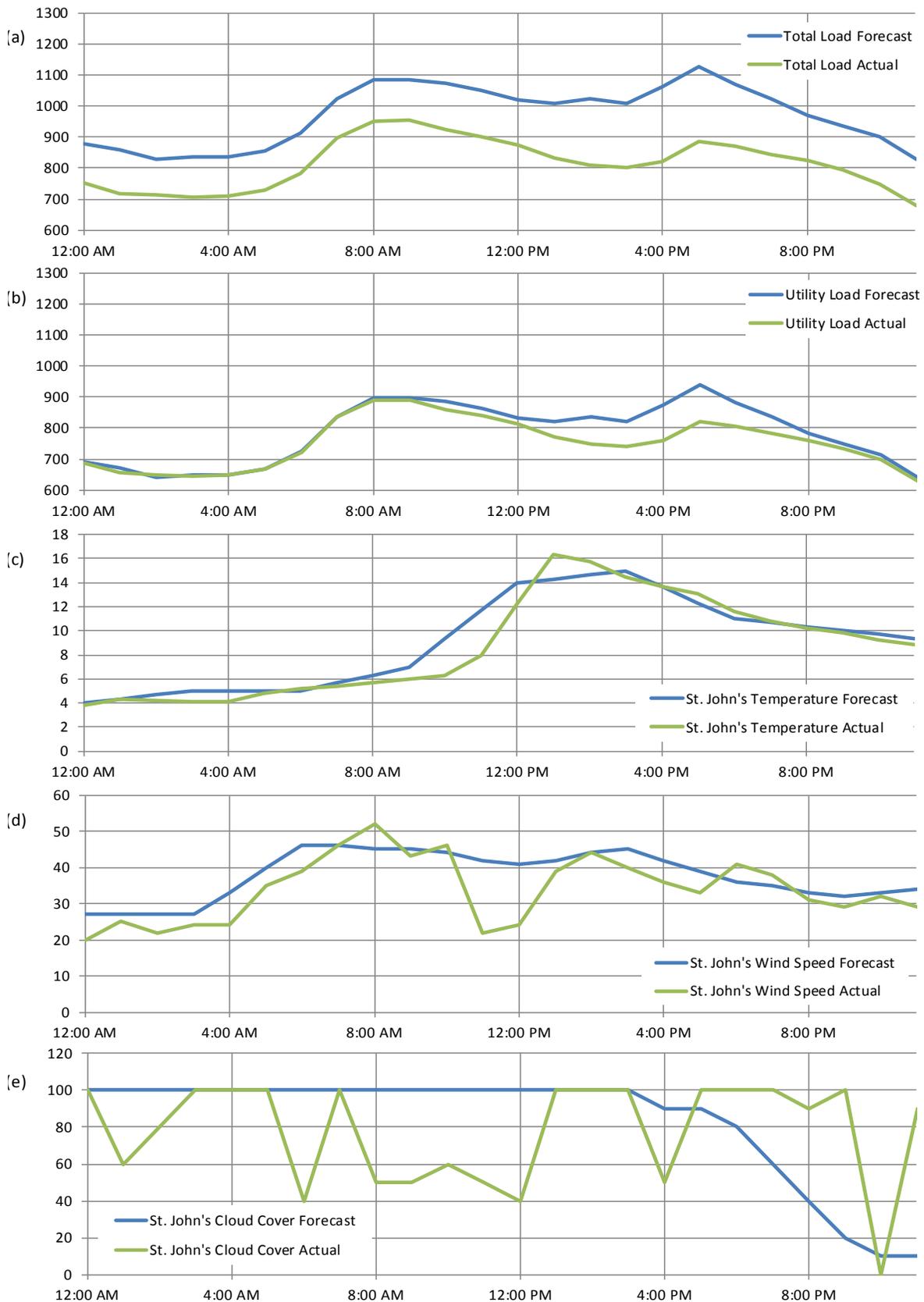


Figure 41 Accuracy Analysis - Nov 08, 2018

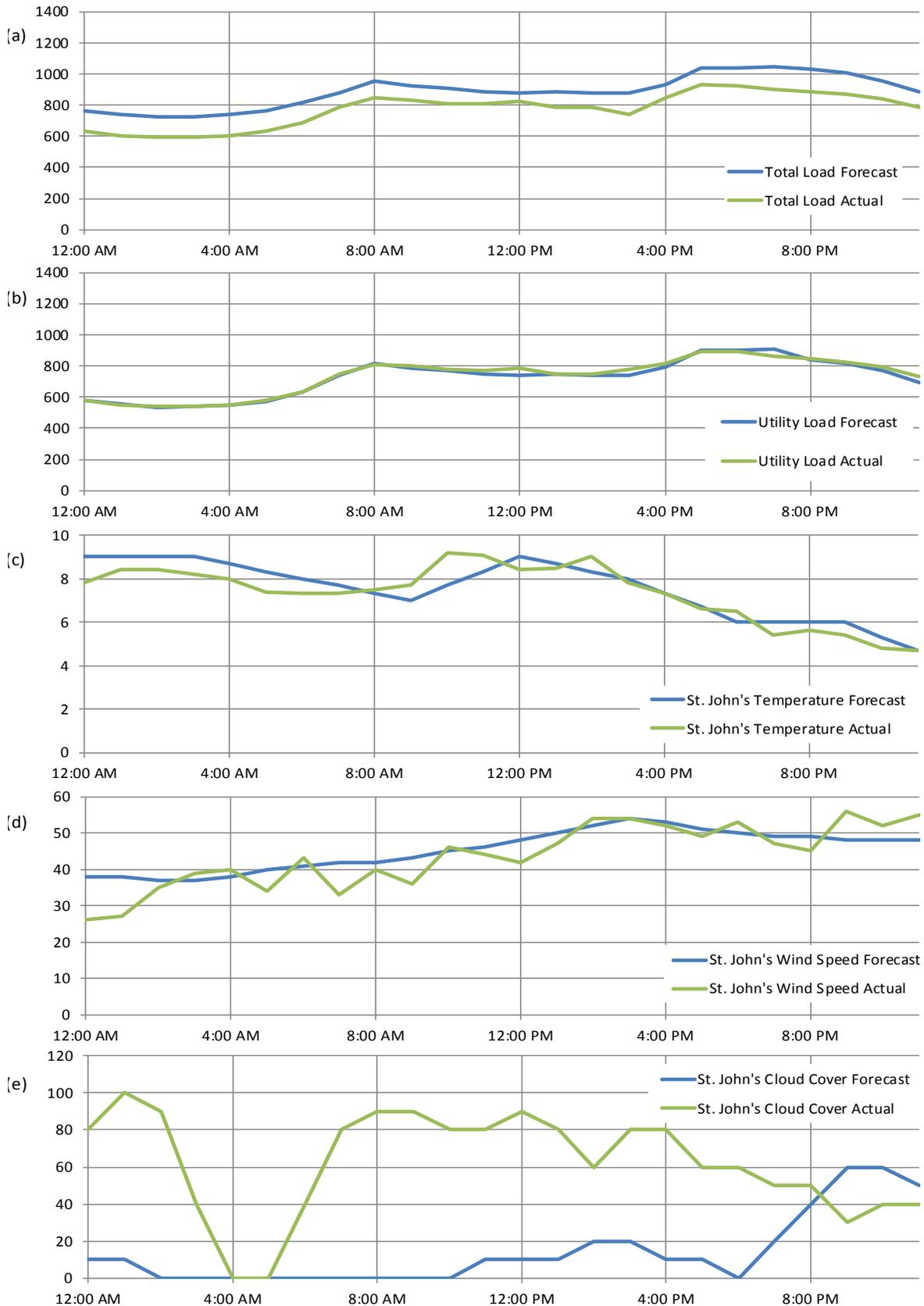


Figure 42 Accuracy Analysis - Dec 07, 2018

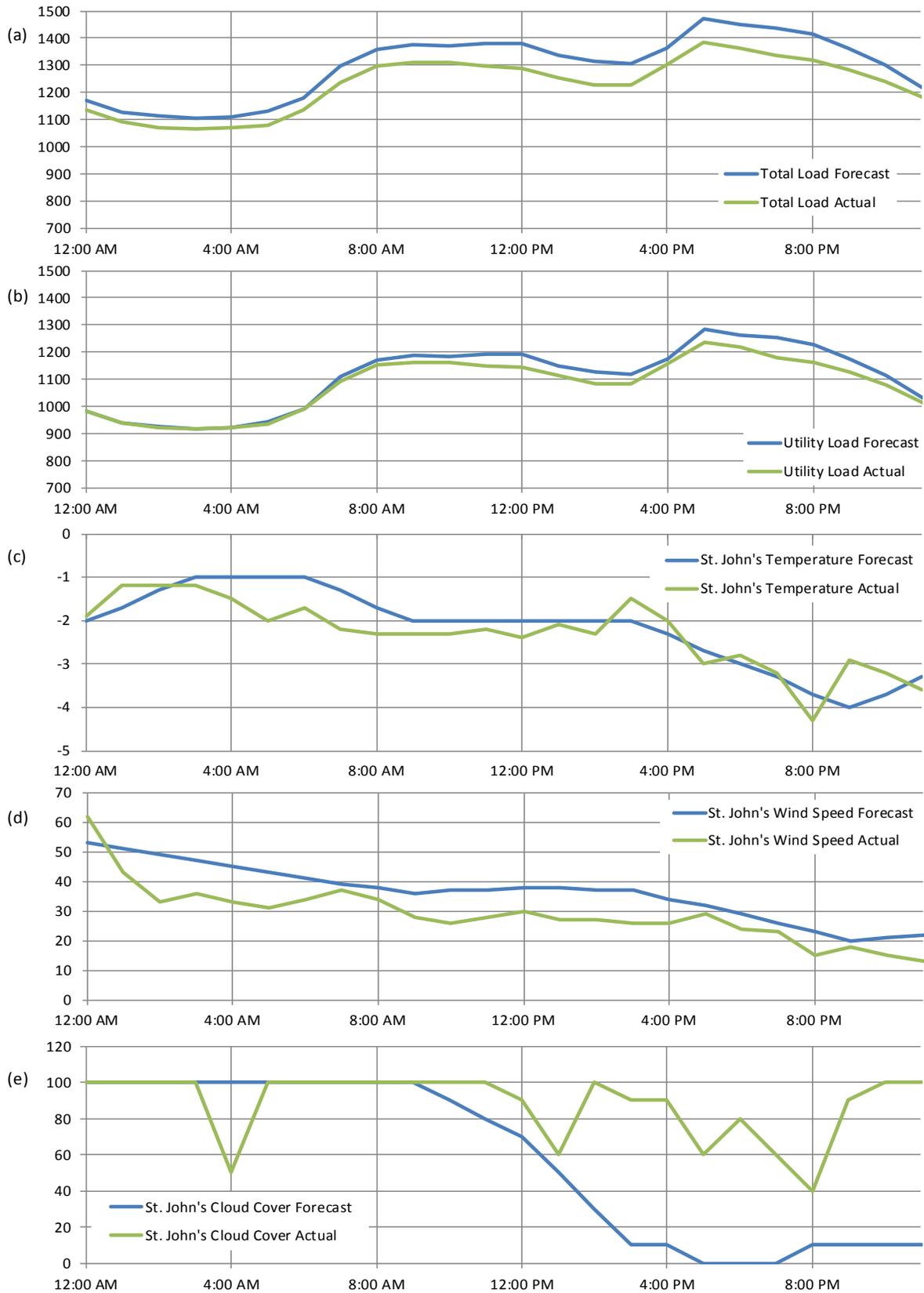


Figure 43 Accuracy Analysis - Dec 08, 2018

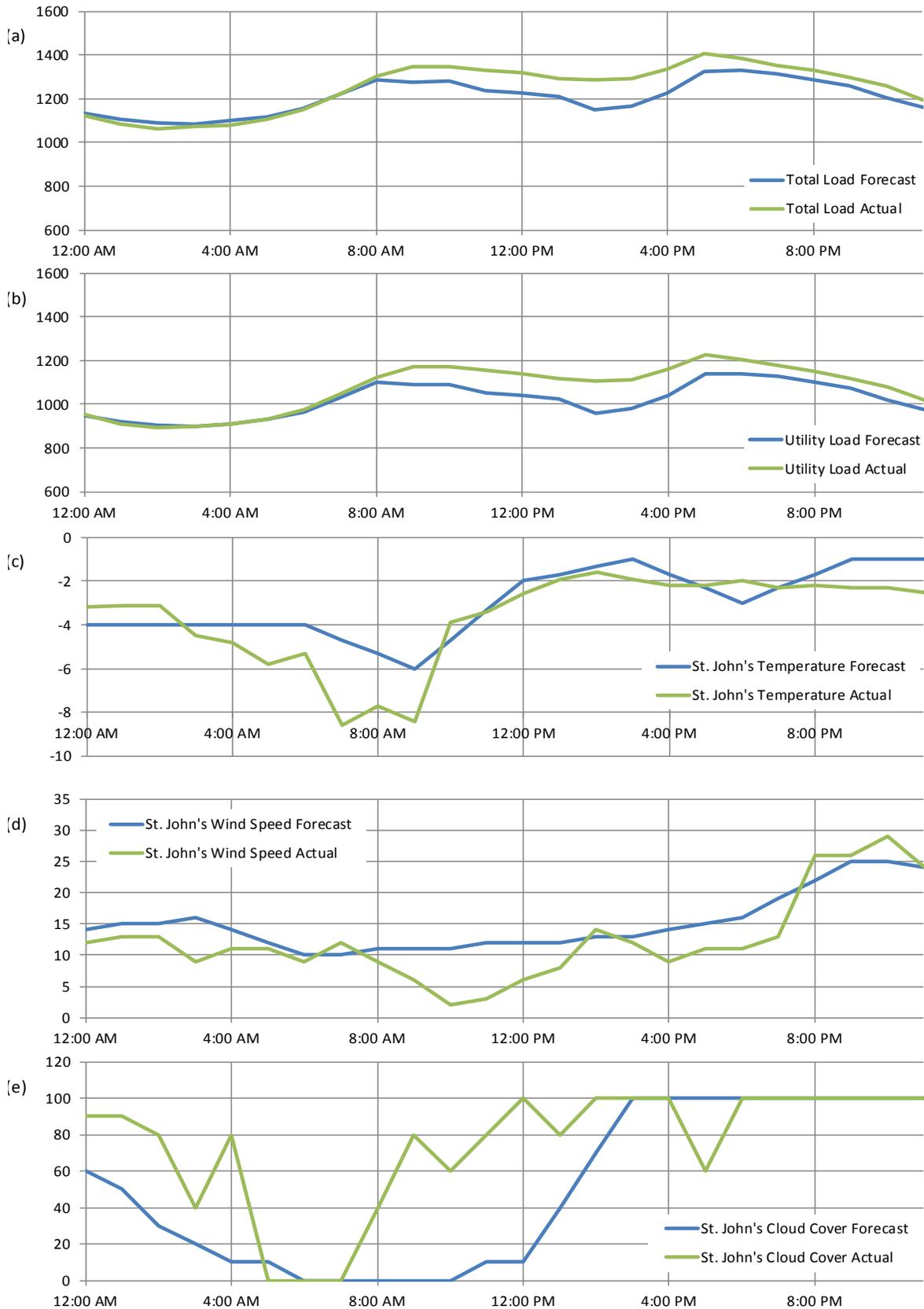


Figure 44 Accuracy Analysis - Dec 18, 2018

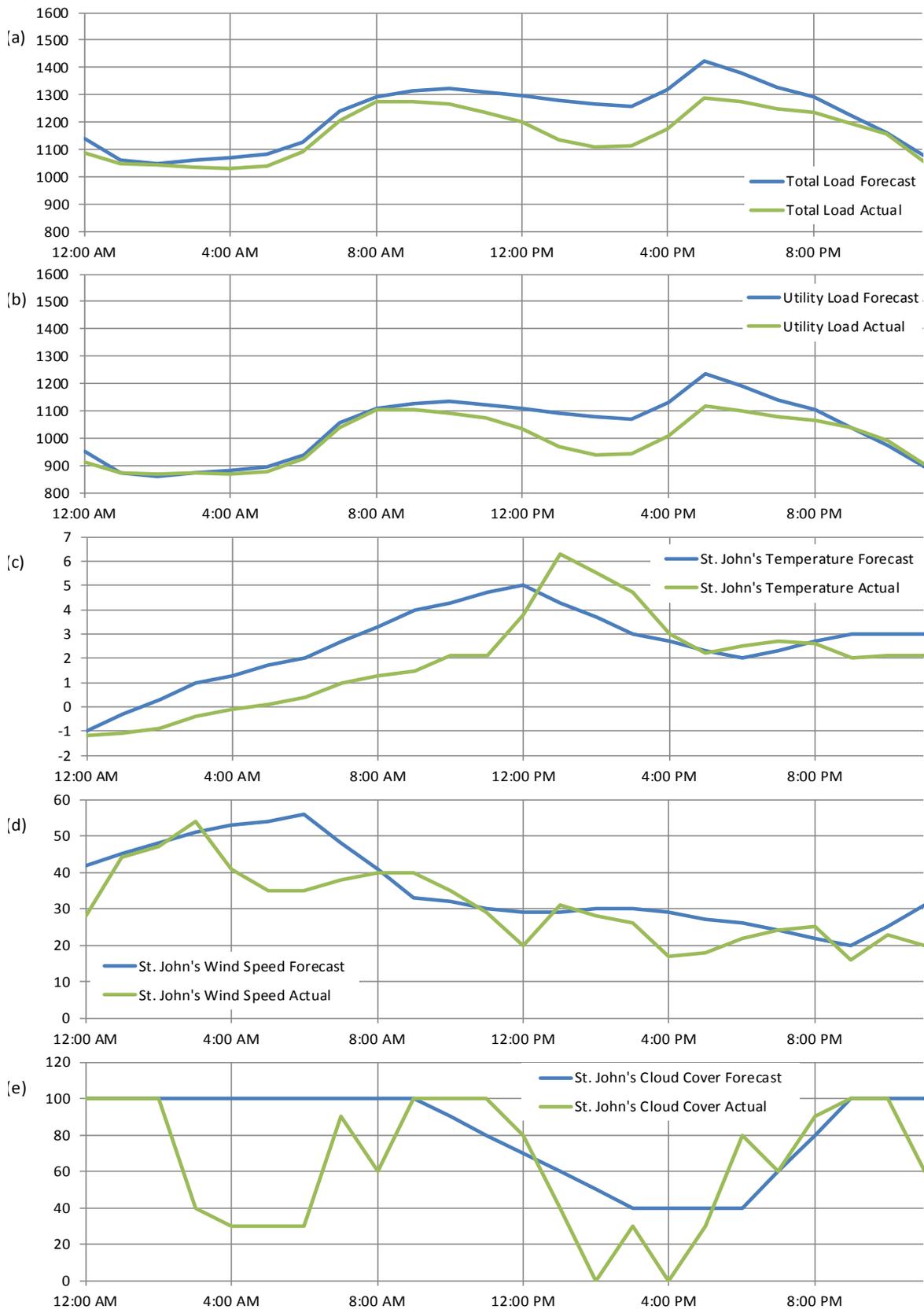


Table 1 - Load Forecasting Data

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Nov-17	940	903	1680	740
2-Nov-17	1045	1101	1500	455
3-Nov-17	1055	1045	1705	650
4-Nov-17	1045	989	1810	765
5-Nov-17	1205	1129	1670	465
6-Nov-17	1195	1173	1690	495
7-Nov-17	1125	976	1555	430
8-Nov-17	1180	1176	1510	330
9-Nov-17	1165	1214	1535	370
10-Nov-17	1145	1128	1510	365
11-Nov-17	1135	1251	1640	505
12-Nov-17	1210	1166	1795	585
13-Nov-17	1215	1178	1610	395
14-Nov-17	1320	1232	1445	125
15-Nov-17	1260	1283	1710	450
16-Nov-17	1325	1296	1685	360
17-Nov-17	1265	1244	1665	400
18-Nov-17	1145	1120	1630	485
19-Nov-17	1230	1163	1510	280
20-Nov-17	1140	1103	1690	550
21-Nov-17	1335	1278	1565	230
22-Nov-17	1295	1248	1580	285
23-Nov-17	1290	1219	1610	320
24-Nov-17	1300	1223	1600	300
25-Nov-17	1255	1172	1665	410
26-Nov-17	1200	1168	1700	500
27-Nov-17	1295	1234	1705	410
28-Nov-17	1390	1345	1740	350
29-Nov-17	1345	1354	1765	420
30-Nov-17	1405	1355	1770	365
Minimum	940	903	1445	125
Average	1215	1182	1642	426
Maximum	1405	1355	1810	765

Table 1 - Load Forecasting Data (continued)

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Dec-17	1335	1325	1615	280
2-Dec-17	1340	1248	1540	200
3-Dec-17	1370	1303	1635	265
4-Dec-17	1400	1343	1620	220
5-Dec-17	1390	1339	1775	385
6-Dec-17	1300	1281	1700	400
7-Dec-17	1320	1246	1730	410
8-Dec-17	1375	1307	1725	350
9-Dec-17	1350	1283	1925	575
10-Dec-17	1230	1153	1925	695
11-Dec-17	1390	1228	1950	560
12-Dec-17	1430	1340	1830	400
13-Dec-17	1320	1255	1950	630
14-Dec-17	1370	1289	1895	525
15-Dec-17	1405	1432	1910	505
16-Dec-17	1415	1453	1905	490
17-Dec-17	1500	1498	1940	440
18-Dec-17	1610	1565	1955	345
19-Dec-17	1485	1458	1835	350
20-Dec-17	1415	1411	1955	540
21-Dec-17	1485	1462	1955	470
22-Dec-17	1535	1468	1930	395
23-Dec-17	1445	1439	1905	460
24-Dec-17	1445	1292	1935	490
25-Dec-17	1535	1438	1900	365
26-Dec-17	1555	1541	1925	370
27-Dec-17	1645	1641	1905	260
28-Dec-17	1535	1577	1785	250
29-Dec-17	1550	1473	1795	245
30-Dec-17	1470	1523	1815	345
31-Dec-17	1525	1453	1750	225
Minimum	1230	1153	1540	200
Average	1435	1389	1836	401
Maximum	1645	1641	1955	695

Table 1 - Load Forecasting Data (continued)

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Jan-18	1530	1416	1910	380
2-Jan-18	1560	1419	1895	335
3-Jan-18	1540	1533	1875	335
4-Jan-18	1515	1510	1850	335
5-Jan-18	1295	1250	1880	585
6-Jan-18	1540	1501	1720	180
7-Jan-18	1635	1601	1935	300
8-Jan-18	1630	1635	1920	290
9-Jan-18	1555	1531	1900	345
10-Jan-18	1640	1591	1925	285
11-Jan-18	1610	1574	1910	300
12-Jan-18	1375	1251	1790	415
13-Jan-18	1215	1064	1975	760
14-Jan-18	1310	1364	1940	630
15-Jan-18	1555	1512	1920	365
16-Jan-18	1555	1474	1920	365
17-Jan-18	1510	1442	1930	420
18-Jan-18	1420	1384	1935	515
19-Jan-18	1420	1434	1925	505
20-Jan-18	1510	1489	1890	380
21-Jan-18	1560	1481	1775	215
22-Jan-18	1635	1545	1750	115
23-Jan-18	1605	1513	1745	140
24-Jan-18	1430	1383	1745	315
25-Jan-18	1505	1477	1765	260
26-Jan-18	1495	1477	1770	275
27-Jan-18	1665	1471	1745	80
28-Jan-18	1470	1323	1775	305
29-Jan-18	1435	1361	1750	315
30-Jan-18	1500	1488	1765	265
31-Jan-18	1495	1465	1765	270
Minimum	1215	1064	1720	80
Average	1507	1450	1848	341
Maximum	1665	1635	1975	760

Table 1 - Load Forecasting Data (continued)

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Feb-18	1470	1448	1760	290
2-Feb-18	1290	1219	1765	475
3-Feb-18	1560	1534	1920	360
4-Feb-18	1530	1526	1735	205
5-Feb-18	1475	1434	1760	285
6-Feb-18	1445	1347	1775	330
7-Feb-18	1445	1433	1730	285
8-Feb-18	1410	1318	1620	210
9-Feb-18	1500	1481	1725	225
10-Feb-18	1470	1487	1735	265
11-Feb-18	1420	1309	1665	245
12-Feb-18	1400	1385	1705	305
13-Feb-18	1685	1512	1765	80
14-Feb-18	1670	1559	1720	50
15-Feb-18	1380	1378	1720	340
16-Feb-18	1350	1329	1715	365
17-Feb-18	1620	1505	1760	140
18-Feb-18	1540	1468	1665	125
19-Feb-18	1495	1467	1715	220
20-Feb-18	1540	1396	1938	398
21-Feb-18	1535	1495	1933	398
22-Feb-18	1600	1482	1915	315
23-Feb-18	1665	1628	1958	293
24-Feb-18	1495	1468	1963	468
25-Feb-18	1555	1478	1888	333
26-Feb-18	1640	1602	2063	423
27-Feb-18	1445	1381	2043	598
28-Feb-18	1360	1342	1993	633
Minimum	1290	1219	1620	50
Average	1500	1443	1809	309
Maximum	1685	1628	2063	633

Table 1 - Load Forecasting Data (continued)

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Mar-18	1325	1286	1795	470
2-Mar-18	1295	1252	1835	540
3-Mar-18	1295	1275	1890	595
4-Mar-18	1300	1244	1890	590
5-Mar-18	1350	1314	1790	440
6-Mar-18	1400	1355	1935	535
7-Mar-18	1375	1345	1875	500
8-Mar-18	1335	1311	1785	450
9-Mar-18	1340	1309	1870	530
10-Mar-18	1300	1258	1855	555
11-Mar-18	1280	1245	1855	575
12-Mar-18	1320	1292	1850	530
13-Mar-18	1285	1275	1870	585
14-Mar-18	1325	1297	1770	445
15-Mar-18	1265	1265	1775	510
16-Mar-18	1260	1245	1780	520
17-Mar-18	1220	1187	1750	530
18-Mar-18	1325	1308	1765	440
19-Mar-18	1375	1411	1845	470
20-Mar-18	1400	1367	1735	335
21-Mar-18	1365	1328	1705	340
22-Mar-18	1340	1363	1880	540
23-Mar-18	1285	1213	1810	525
24-Mar-18	1290	1282	1690	400
25-Mar-18	1425	1372	1760	335
26-Mar-18	1490	1467	1735	245
27-Mar-18	1425	1415	1785	360
28-Mar-18	1315	1312	1790	475
29-Mar-18	1220	1216	1745	525
30-Mar-18	1275	1192	1750	475
31-Mar-18	1135	1175	1575	440
Minimum	1135	1175	1575	245
Average	1320	1296	1798	478
Maximum	1490	1467	1935	595

Table 1 - Load Forecasting Data (continued)

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Apr-18	1280	1293	1780	500
2-Apr-18	1270	1187	1745	475
3-Apr-18	1295	1273	1725	430
4-Apr-18	1365	1331	1765	400
5-Apr-18	1230	1197	1610	380
6-Apr-18	1335	1366	1730	395
7-Apr-18	1370	1336	1715	345
8-Apr-18	1275	1279	1690	415
9-Apr-18	1395	1332	1695	300
10-Apr-18	1375	1329	1715	340
11-Apr-18	1345	1288	1695	350
12-Apr-18	1330	1305	1705	375
13-Apr-18	1320	1278	1685	365
14-Apr-18	1295	1290	1720	425
15-Apr-18	1430	1357	1680	250
16-Apr-18	1340	1336	1720	380
17-Apr-18	1315	1288	1775	460
18-Apr-18	1265	1277	1720	455
19-Apr-18	1200	1189	1645	445
20-Apr-18	1200	1249	1655	455
21-Apr-18	1230	1120	1665	435
22-Apr-18	1235	1117	1630	395
23-Apr-18	1165	1154	1605	440
24-Apr-18	1125	1105	1560	435
25-Apr-18	1070	1055	1545	475
26-Apr-18	985	958	1585	600
27-Apr-18	965	932	1580	615
28-Apr-18	910	850	1540	630
29-Apr-18	875	863	1590	715
30-Apr-18	1010	982	1460	450
Minimum	875	850	1460	250
Average	1227	1197	1664	438
Maximum	1430	1366	1780	715

Table 1 - Load Forecasting Data (continued)

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-May-18	1060	1079	1395	335
2-May-18	975	909	1480	505
3-May-18	1115	1120	1465	350
4-May-18	1175	1170	1510	335
5-May-18	1135	1170	1480	345
6-May-18	1050	945	1480	430
7-May-18	1040	1032	1435	395
8-May-18	1075	1031	1410	335
9-May-18	1030	997	1450	420
10-May-18	1045	1018	1405	360
11-May-18	945	922	1455	510
12-May-18	990	935	1495	505
13-May-18	975	938	1460	485
14-May-18	985	966	1410	425
15-May-18	900	873	1400	500
16-May-18	965	894	1430	465
17-May-18	1005	974	1380	375
18-May-18	1005	968	1405	400
19-May-18	985	891	1430	445
20-May-18	965	934	1425	460
21-May-18	895	876	1375	480
22-May-18	965	948	1450	485
23-May-18	990	969	1445	455
24-May-18	1085	1030	1430	345
25-May-18	1110	1070	1410	300
26-May-18	1020	1031	1425	405
27-May-18	1045	1048	1455	410
28-May-18	1005	987	1370	365
29-May-18	965	906	1310	345
30-May-18	1065	1121	1405	340
31-May-18	1125	1119	1455	330
Minimum	895	873	1310	300
Average	1022	996	1430	408
Maximum	1175	1170	1510	510

Table 1 - Load Forecasting Data (continued)

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Jun-18	1035	1027	1415	380
2-Jun-18	915	898	1415	500
3-Jun-18	1135	1131	1580	445
4-Jun-18	1220	1200	1450	230
5-Jun-18	1065	1033	1405	340
6-Jun-18	1080	1053	1445	365
7-Jun-18	1045	1010	1420	375
8-Jun-18	935	903	1420	485
9-Jun-18	915	921	1410	495
10-Jun-18	935	872	1410	475
11-Jun-18	940	917	1400	460
12-Jun-18	995	992	1405	410
13-Jun-18	970	983	1345	375
14-Jun-18	1015	995	1395	380
15-Jun-18	980	987	1310	330
16-Jun-18	935	829	1190	255
17-Jun-18	970	957	1270	300
18-Jun-18	995	993	1505	510
19-Jun-18	930	917	1240	310
20-Jun-18	875	851	1215	340
21-Jun-18	815	794	1255	440
22-Jun-18	830	856	1185	355
23-Jun-18	800	769	1190	390
24-Jun-18	810	822	1305	495
25-Jun-18	955	976	1320	365
26-Jun-18	1070	1110	1325	255
27-Jun-18	1010	953	1345	335
28-Jun-18	855	810	1145	290
29-Jun-18	805	784	1355	550
30-Jun-18	780	769	1435	655
Minimum	780	769	1145	230
Average	954	937	1350	396
Maximum	1220	1200	1580	655

Table 1 - Load Forecasting Data (continued)

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Jul-18	815	782	1335	520
2-Jul-18	830	752	1440	610
3-Jul-18	810	795	1280	470
4-Jul-18	790	826	1200	410
5-Jul-18	795	716	1165	370
6-Jul-18	785	730	1205	420
7-Jul-18	765	714	1245	480
8-Jul-18	750	709	1320	570
9-Jul-18	795	805	1145	350
10-Jul-18	780	733	1095	315
11-Jul-18	770	704	1110	340
12-Jul-18	785	783	1095	310
13-Jul-18	780	742	1100	320
14-Jul-18	760	727	1205	445
15-Jul-18	755	755	1210	455
16-Jul-18	785	753	1095	310
17-Jul-18	790	739	1105	315
18-Jul-18	775	760	1095	320
19-Jul-18	790	786	1105	315
20-Jul-18	795	773	1010	215
21-Jul-18	755	723	1090	335
22-Jul-18	755	752	1190	435
23-Jul-18	800	785	1070	270
24-Jul-18	815	746	1045	230
25-Jul-18	795	782	1075	280
26-Jul-18	810	755	1090	280
27-Jul-18	800	771	1100	300
28-Jul-18	765	727	1265	500
29-Jul-18	755	704	1285	530
30-Jul-18	800	765	1240	440
31-Jul-18	790	757	1220	430
Minimum	750	704	1010	215
Average	785	753	1169	384
Maximum	830	826	1440	610

Table 1 - Load Forecasting Data (continued)

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Aug-18	790	746	1320	530
2-Aug-18	800	733	1200	400
3-Aug-18	785	751	1320	535
4-Aug-18	765	704	1270	505
5-Aug-18	765	709	1315	550
6-Aug-18	800	736	1325	525
7-Aug-18	775	772	1195	420
8-Aug-18	780	800	1215	435
9-Aug-18	785	705	1215	430
10-Aug-18	790	745	1260	470
11-Aug-18	745	689	1230	485
12-Aug-18	755	691	1225	470
13-Aug-18	785	742	1210	425
14-Aug-18	790	719	1205	415
15-Aug-18	765	724	1215	450
16-Aug-18	795	737	1210	415
17-Aug-18	795	724	1290	495
18-Aug-18	720	668	1335	615
19-Aug-18	725	674	1355	630
20-Aug-18	775	720	1335	560
21-Aug-18	775	705	1260	485
22-Aug-18	770	714	1125	355
23-Aug-18	755	747	1235	480
24-Aug-18	760	749	1225	465
25-Aug-18	735	702	1210	475
26-Aug-18	735	702	1205	470
27-Aug-18	775	758	1200	425
28-Aug-18	780	744	1210	430
29-Aug-18	780	761	1175	395
30-Aug-18	780	747	1200	420
31-Aug-18	780	763	1180	400
Minimum	720	668	1125	355
Average	771	728	1241	470
Maximum	800	800	1355	630

Table 1 - Load Forecasting Data (continued)

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Sep-18	755	710	1200	445
2-Sep-18	745	709	1195	450
3-Sep-18	765	695	1205	440
4-Sep-18	770	754	1225	455
5-Sep-18	755	718	1130	375
6-Sep-18	770	747	1200	430
7-Sep-18	765	688	1200	435
8-Sep-18	745	682	1190	445
9-Sep-18	755	712	1190	435
10-Sep-18	780	725	1115	335
11-Sep-18	775	740	1100	325
12-Sep-18	785	800	1195	410
13-Sep-18	770	761	1190	420
14-Sep-18	795	771	1180	385
15-Sep-18	740	778	1200	460
16-Sep-18	765	768	1245	480
17-Sep-18	825	809	1380	555
18-Sep-18	930	927	1340	410
19-Sep-18	965	961	1270	305
20-Sep-18	940	921	1330	390
21-Sep-18	960	945	1270	310
22-Sep-18	875	942	1405	530
23-Sep-18	845	812	1305	460
24-Sep-18	895	889	1335	440
25-Sep-18	985	953	1320	335
26-Sep-18	1020	958	1150	130
27-Sep-18	855	806	1330	475
28-Sep-18	875	835	1335	460
29-Sep-18	800	779	1325	525
30-Sep-18	865	821	1330	465
Minimum	740	682	1100	130
Average	829	804	1246	417
Maximum	1020	961	1405	555

Table 1 - Load Forecasting Data (continued)

Date	Forecast Total Peak, MW	Actual Total Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Oct-18	915	901	1280	365
2-Oct-18	960	921	1300	340
3-Oct-18	1035	999	1350	315
4-Oct-18	915	877	1315	400
5-Oct-18	875	778	1540	665
6-Oct-18	855	815	1540	685
7-Oct-18	895	939	1530	635
8-Oct-18	915	912	1465	550
9-Oct-18	1040	1025	1455	415
10-Oct-18	1030	995	1465	435
11-Oct-18	1110	1086	1480	370
12-Oct-18	1130	1098	1465	335
13-Oct-18	1005	951	1480	475
14-Oct-18	940	960	1455	515
15-Oct-18	1035	1029	1470	435
16-Oct-18	1030	1036	1430	400
17-Oct-18	1020	989	1445	425
18-Oct-18	1020	1014	1410	390
19-Oct-18	1100	1065	1460	360
20-Oct-18	1035	1042	1710	675
21-Oct-18	950	916	1780	830
22-Oct-18	1000	965	1810	810
23-Oct-18	1075	1062	1665	590
24-Oct-18	1140	1134	1675	535
25-Oct-18	1035	1024	1705	670
26-Oct-18	1040	1026	1620	580
27-Oct-18	1025	1072	1645	620
28-Oct-18	1095	1141	1635	540
29-Oct-18	980	975	1650	670
30-Oct-18	955	864	1690	735
31-Oct-18	1045	971	1660	615
Minimum	855	778	1280	315
Average	1006	987	1535	528
Maximum	1140	1141	1810	830

Table 1 - Load Forecasting Data (continued)

Date	Forecast Peak, MW	Actual Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Nov-18	1085	1110	1635	550
2-Nov-18	1045	1005	1495	450
3-Nov-18	1040	1028	1510	470
4-Nov-18	1140	1013	1565	425
5-Nov-18	1205	1095	1605	400
6-Nov-18	1275	1051	1605	330
7-Nov-18	1130	962	1715	585
8-Nov-18	1090	938	1735	645
9-Nov-18	1110	1007	1825	715
10-Nov-18	1145	1218	1770	625
11-Nov-18	1185	1148	1435	250
12-Nov-18	1270	1215	1830	560
13-Nov-18	1275	1237	1610	335
14-Nov-18	1410	1330	1795	385
15-Nov-18	1425	1394	1755	330
16-Nov-18	1360	1338	1645	285
17-Nov-18	1330	1286	1680	350
18-Nov-18	1300	1280	1665	365
19-Nov-18	1370	1348	1535	165
20-Nov-18	1315	1301	1640	325
21-Nov-18	1260	1185	1800	540
22-Nov-18	1310	1283	1820	510
23-Nov-18	1500	1440	1805	305
24-Nov-18	1460	1457	1810	350
25-Nov-18	1345	1377	1920	575
26-Nov-18	1300	1299	1845	545
27-Nov-18	1285	1324	1835	550
28-Nov-18	1295	1319	1960	665
29-Nov-18	1345	1261	1900	555
30-Nov-18	1310	1405	1910	600
Minimum	1040	938	1435	165
Average	1264	1222	1722	458
Maximum	1500	1457	1960	715

Table 1 - Load Forecasting Data (continued)

Date	Forecast Peak, MW	Actual Peak, MW	Available Island Supply, MW	Forecast Reserve, MW
1-Dec-18	1270	1270	1800	530
2-Dec-18	1275	1255	1775	500
3-Dec-18	1360	1345	1805	445
4-Dec-18	1310	1323	1775	465
5-Dec-18	1455	1466	1785	330
6-Dec-18	1465	1484	1655	190
7-Dec-18	1470	1393	1700	230
8-Dec-18	1330	1410	1998	668
9-Dec-18	1430	1506	2015	585
10-Dec-18	1435	1432	1810	375
11-Dec-18	1445	1487	1830	385
12-Dec-18	1435	1449	1872	437
13-Dec-18	1495	1502	1913	418
14-Dec-18	1460	1459	1917	457
15-Dec-18	1390	1349	2070	680
16-Dec-18	1405	1391	2071	666
17-Dec-18	1395	1420	2036	641
18-Dec-18	1425	1293	1996	571
19-Dec-18	1380	1349	2110	730
20-Dec-18	1425	1449	2133	708
21-Dec-18	1390	1364	2104	714
22-Dec-18	1310	1326	2115	805
23-Dec-18	1300	1242	2135	835
24-Dec-18	1470	1438	2125	655
25-Dec-18	1495	1417	2105	610
26-Dec-18	1525	1448	2140	615
27-Dec-18	1495	1506	2055	560
28-Dec-18	1595	1583	2085	490
29-Dec-18	1540	1549	2085	545
30-Dec-18	1400	1421	2077	677
31-Dec-18	1570	1627	2107	537
Minimum	1270	1242	1655	190
Average	1424	1418	1974	550
Maximum	1595	1627	2140	835

Note:

Forecast Reserve has not been adjusted for Interruptible Load or the impact of voltage reduction.

Table 2 - Analysis of Total Forecast Error

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Nov-17	903	940	37	37	4.1%	4.1%	3.9%
2-Nov-17	1101	1045	-56	56	-5.1%	5.1%	-5.3%
3-Nov-17	1045	1055	10	10	0.9%	0.9%	0.9%
4-Nov-17	989	1045	56	56	5.7%	5.7%	5.4%
5-Nov-17	1129	1205	76	76	6.7%	6.7%	6.3%
6-Nov-17	1173	1195	22	22	1.9%	1.9%	1.9%
7-Nov-17	976	1125	149	149	15.3%	15.3%	13.2%
8-Nov-17	1176	1180	4	4	0.4%	0.4%	0.4%
9-Nov-17	1214	1165	-49	49	-4.0%	4.0%	-4.2%
10-Nov-17	1128	1145	17	17	1.5%	1.5%	1.5%
11-Nov-17	1251	1135	-116	116	-9.2%	9.2%	-10.2%
12-Nov-17	1166	1210	44	44	3.7%	3.7%	3.6%
13-Nov-17	1178	1215	37	37	3.1%	3.1%	3.0%
14-Nov-17	1232	1320	88	88	7.1%	7.1%	6.6%
15-Nov-17	1283	1260	-23	23	-1.8%	1.8%	-1.8%
16-Nov-17	1296	1325	29	29	2.3%	2.3%	2.2%
17-Nov-17	1244	1265	21	21	1.7%	1.7%	1.7%
18-Nov-17	1120	1145	25	25	2.2%	2.2%	2.2%
19-Nov-17	1163	1230	67	67	5.7%	5.7%	5.4%
20-Nov-17	1103	1140	37	37	3.4%	3.4%	3.3%
21-Nov-17	1278	1335	57	57	4.4%	4.4%	4.2%
22-Nov-17	1248	1295	47	47	3.8%	3.8%	3.6%
23-Nov-17	1219	1290	71	71	5.9%	5.9%	5.5%
24-Nov-17	1223	1300	77	77	6.3%	6.3%	5.9%
25-Nov-17	1172	1255	83	83	7.1%	7.1%	6.6%
26-Nov-17	1168	1200	32	32	2.7%	2.7%	2.7%
27-Nov-17	1234	1295	61	61	5.0%	5.0%	4.7%
28-Nov-17	1345	1390	45	45	3.3%	3.3%	3.2%
29-Nov-17	1354	1345	-9	9	-0.7%	0.7%	-0.7%
30-Nov-17	1355	1405	50	50	3.7%	3.7%	3.5%
Minimum	903	940	-116	4	-9.2%	0.4%	-10.2%
Average	1182	1215	33	50	2.9%	4.3%	2.6%
Maximum	1355	1405	149	149	15.3%	15.3%	13.2%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Dec-17	1325	1335	10	10	0.8%	0.8%	0.8%
2-Dec-17	1248	1340	92	92	7.4%	7.4%	6.9%
3-Dec-17	1303	1370	67	67	5.1%	5.1%	4.9%
4-Dec-17	1343	1400	57	57	4.2%	4.2%	4.1%
5-Dec-17	1339	1390	51	51	3.8%	3.8%	3.7%
6-Dec-17	1281	1300	19	19	1.5%	1.5%	1.5%
7-Dec-17	1246	1320	74	74	6.0%	6.0%	5.6%
8-Dec-17	1307	1375	68	68	5.2%	5.2%	4.9%
9-Dec-17	1283	1350	67	67	5.3%	5.3%	5.0%
10-Dec-17	1153	1230	77	77	6.7%	6.7%	6.3%
11-Dec-17	1228	1390	162	162	13.2%	13.2%	11.6%
12-Dec-17	1340	1430	90	90	6.7%	6.7%	6.3%
13-Dec-17	1255	1320	65	65	5.1%	5.1%	4.9%
14-Dec-17	1289	1370	81	81	6.3%	6.3%	5.9%
15-Dec-17	1432	1405	-27	27	-1.9%	1.9%	-1.9%
16-Dec-17	1453	1415	-38	38	-2.6%	2.6%	-2.7%
17-Dec-17	1498	1500	2	2	0.2%	0.2%	0.2%
18-Dec-17	1565	1610	45	45	2.9%	2.9%	2.8%
19-Dec-17	1458	1485	27	27	1.9%	1.9%	1.8%
20-Dec-17	1411	1415	4	4	0.3%	0.3%	0.3%
21-Dec-17	1462	1485	23	23	1.6%	1.6%	1.6%
22-Dec-17	1468	1535	67	67	4.5%	4.5%	4.3%
23-Dec-17	1439	1445	6	6	0.4%	0.4%	0.4%
24-Dec-17	1292	1445	153	153	11.9%	11.9%	10.6%
25-Dec-17	1438	1535	97	97	6.7%	6.7%	6.3%
26-Dec-17	1541	1555	14	14	0.9%	0.9%	0.9%
27-Dec-17	1641	1645	4	4	0.2%	0.2%	0.2%
28-Dec-17	1577	1535	-42	42	-2.7%	2.7%	-2.7%
29-Dec-17	1473	1550	77	77	5.2%	5.2%	4.9%
30-Dec-17	1523	1470	-53	53	-3.5%	3.5%	-3.6%
31-Dec-17	1453	1525	72	72	4.9%	4.9%	4.7%
Minimum	1153	1230	-53	2	-3.5%	0.2%	-3.6%
Average	1389	1435	46	56	3.5%	4.2%	3.2%
Maximum	1641	1645	162	162	13.2%	13.2%	11.6%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Jan-18	1416	1530	114	114	8.0%	8.0%	7.4%
2-Jan-18	1419	1560	141	141	10.0%	10.0%	9.1%
3-Jan-18	1533	1540	7	7	0.5%	0.5%	0.5%
4-Jan-18	1510	1515	5	5	0.3%	0.3%	0.3%
5-Jan-18	1250	1295	45	45	3.6%	3.6%	3.4%
6-Jan-18	1501	1540	39	39	2.6%	2.6%	2.5%
7-Jan-18	1601	1635	34	34	2.1%	2.1%	2.1%
8-Jan-18	1635	1630	-5	5	-0.3%	0.3%	-0.3%
9-Jan-18	1531	1555	24	24	1.6%	1.6%	1.6%
10-Jan-18	1591	1640	49	49	3.1%	3.1%	3.0%
11-Jan-18	1574	1610	36	36	2.3%	2.3%	2.2%
12-Jan-18	1251	1375	124	124	9.9%	9.9%	9.0%
13-Jan-18	1064	1215	151	151	14.2%	14.2%	12.4%
14-Jan-18	1364	1310	-54	54	-4.0%	4.0%	-4.2%
15-Jan-18	1512	1555	43	43	2.8%	2.8%	2.7%
16-Jan-18	1474	1555	81	81	5.5%	5.5%	5.2%
17-Jan-18	1442	1510	68	68	4.7%	4.7%	4.5%
18-Jan-18	1384	1420	36	36	2.6%	2.6%	2.6%
19-Jan-18	1434	1420	-14	14	-1.0%	1.0%	-1.0%
20-Jan-18	1489	1510	21	21	1.4%	1.4%	1.4%
21-Jan-18	1481	1560	79	79	5.3%	5.3%	5.0%
22-Jan-18	1545	1635	90	90	5.8%	5.8%	5.5%
23-Jan-18	1513	1605	92	92	6.1%	6.1%	5.7%
24-Jan-18	1383	1430	47	47	3.4%	3.4%	3.3%
25-Jan-18	1477	1505	28	28	1.9%	1.9%	1.8%
26-Jan-18	1477	1495	18	18	1.2%	1.2%	1.2%
27-Jan-18	1471	1665	194	194	13.2%	13.2%	11.7%
28-Jan-18	1323	1470	147	147	11.1%	11.1%	10.0%
29-Jan-18	1361	1435	74	74	5.4%	5.4%	5.2%
30-Jan-18	1488	1500	12	12	0.8%	0.8%	0.8%
31-Jan-18	1465	1495	30	30	2.1%	2.1%	2.0%
Minimum	1064	1215	-54	5	-4.0%	0.3%	-4.2%
Average	1450	1507	57	61	4.1%	4.4%	3.8%
Maximum	1635	1665	194	194	14.2%	14.2%	12.4%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Feb-18	1448	1470	22	22	1.5%	1.5%	1.5%
2-Feb-18	1219	1290	71	71	5.8%	5.8%	5.5%
3-Feb-18	1534	1560	26	26	1.7%	1.7%	1.6%
4-Feb-18	1526	1530	4	4	0.3%	0.3%	0.3%
5-Feb-18	1434	1475	41	41	2.9%	2.9%	2.8%
6-Feb-18	1347	1445	98	98	7.3%	7.3%	6.8%
7-Feb-18	1433	1445	12	12	0.8%	0.8%	0.8%
8-Feb-18	1318	1410	92	92	7.0%	7.0%	6.6%
9-Feb-18	1481	1500	19	19	1.3%	1.3%	1.3%
10-Feb-18	1487	1470	-17	17	-1.2%	1.2%	-1.2%
11-Feb-18	1309	1420	111	111	8.4%	8.4%	7.8%
12-Feb-18	1385	1400	15	15	1.1%	1.1%	1.0%
13-Feb-18	1512	1685	173	173	11.4%	11.4%	10.3%
14-Feb-18	1559	1670	111	111	7.1%	7.1%	6.6%
15-Feb-18	1378	1380	2	2	0.2%	0.2%	0.2%
16-Feb-18	1329	1350	21	21	1.6%	1.6%	1.6%
17-Feb-18	1505	1620	115	115	7.7%	7.7%	7.1%
18-Feb-18	1468	1540	72	72	4.9%	4.9%	4.7%
19-Feb-18	1467	1495	28	28	1.9%	1.9%	1.9%
20-Feb-18	1396	1540	144	144	10.3%	10.3%	9.3%
21-Feb-18	1495	1535	40	40	2.7%	2.7%	2.6%
22-Feb-18	1482	1600	118	118	8.0%	8.0%	7.4%
23-Feb-18	1628	1665	37	37	2.3%	2.3%	2.2%
24-Feb-18	1468	1495	27	27	1.8%	1.8%	1.8%
25-Feb-18	1478	1555	77	77	5.2%	5.2%	5.0%
26-Feb-18	1602	1640	38	38	2.4%	2.4%	2.3%
27-Feb-18	1381	1445	64	64	4.7%	4.7%	4.5%
28-Feb-18	1342	1360	18	18	1.4%	1.4%	1.3%
Minimum	1219	1290	-17	2	-1.2%	0.2%	-1.2%
Average	1443	1500	56	58	3.9%	4.0%	3.7%
Maximum	1628	1685	173	173	11.4%	11.4%	10.3%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Mar-18	1286	1325	39	39	3.1%	3.1%	3.0%
2-Mar-18	1252	1295	43	43	3.4%	3.4%	3.3%
3-Mar-18	1275	1295	20	20	1.5%	1.5%	1.5%
4-Mar-18	1244	1300	56	56	4.5%	4.5%	4.3%
5-Mar-18	1314	1350	36	36	2.7%	2.7%	2.7%
6-Mar-18	1355	1400	45	45	3.3%	3.3%	3.2%
7-Mar-18	1345	1375	30	30	2.2%	2.2%	2.2%
8-Mar-18	1311	1335	24	24	1.8%	1.8%	1.8%
9-Mar-18	1309	1340	31	31	2.3%	2.3%	2.3%
10-Mar-18	1258	1300	42	42	3.3%	3.3%	3.2%
11-Mar-18	1245	1280	35	35	2.8%	2.8%	2.7%
12-Mar-18	1292	1320	28	28	2.2%	2.2%	2.1%
13-Mar-18	1275	1285	10	10	0.8%	0.8%	0.8%
14-Mar-18	1297	1325	28	28	2.2%	2.2%	2.1%
15-Mar-18	1265	1265	0	0	0.0%	0.0%	0.0%
16-Mar-18	1245	1260	15	15	1.2%	1.2%	1.2%
17-Mar-18	1187	1220	33	33	2.8%	2.8%	2.7%
18-Mar-18	1308	1325	17	17	1.3%	1.3%	1.3%
19-Mar-18	1411	1375	-36	36	-2.5%	2.5%	-2.6%
20-Mar-18	1367	1400	33	33	2.4%	2.4%	2.4%
21-Mar-18	1328	1365	37	37	2.8%	2.8%	2.7%
22-Mar-18	1363	1340	-23	23	-1.7%	1.7%	-1.7%
23-Mar-18	1213	1285	72	72	5.9%	5.9%	5.6%
24-Mar-18	1282	1290	8	8	0.6%	0.6%	0.6%
25-Mar-18	1372	1425	53	53	3.9%	3.9%	3.7%
26-Mar-18	1467	1490	23	23	1.6%	1.6%	1.5%
27-Mar-18	1415	1425	10	10	0.7%	0.7%	0.7%
28-Mar-18	1312	1315	3	3	0.3%	0.3%	0.3%
29-Mar-18	1216	1220	4	4	0.3%	0.3%	0.3%
30-Mar-18	1192	1275	83	83	7.0%	7.0%	6.5%
31-Mar-18	1175	1135	-40	40	-3.4%	3.4%	-3.6%
Minimum	1175	1135	-40	0	-3.4%	0.0%	-3.6%
Average	1296	1320	25	31	1.9%	2.4%	1.8%
Maximum	1467	1490	83	83	7.0%	7.0%	6.5%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Apr-18	1293	1280	-13	13	-1.0%	1.0%	-1.0%
2-Apr-18	1187	1270	83	83	7.0%	7.0%	6.6%
3-Apr-18	1273	1295	22	22	1.7%	1.7%	1.7%
4-Apr-18	1331	1365	34	34	2.5%	2.5%	2.5%
5-Apr-18	1197	1230	33	33	2.7%	2.7%	2.7%
6-Apr-18	1366	1335	-31	31	-2.3%	2.3%	-2.3%
7-Apr-18	1336	1370	34	34	2.5%	2.5%	2.5%
8-Apr-18	1279	1275	-4	4	-0.3%	0.3%	-0.3%
9-Apr-18	1332	1395	63	63	4.7%	4.7%	4.5%
10-Apr-18	1329	1375	46	46	3.5%	3.5%	3.3%
11-Apr-18	1288	1345	57	57	4.4%	4.4%	4.2%
12-Apr-18	1305	1330	25	25	2.0%	2.0%	1.9%
13-Apr-18	1278	1320	42	42	3.3%	3.3%	3.2%
14-Apr-18	1290	1295	5	5	0.4%	0.4%	0.4%
15-Apr-18	1357	1430	73	73	5.4%	5.4%	5.1%
16-Apr-18	1336	1340	4	4	0.3%	0.3%	0.3%
17-Apr-18	1288	1315	27	27	2.1%	2.1%	2.1%
18-Apr-18	1277	1265	-12	12	-0.9%	0.9%	-0.9%
19-Apr-18	1189	1200	11	11	0.9%	0.9%	0.9%
20-Apr-18	1249	1200	-49	49	-3.9%	3.9%	-4.1%
21-Apr-18	1120	1230	110	110	9.8%	9.8%	8.9%
22-Apr-18	1117	1235	118	118	10.6%	10.6%	9.6%
23-Apr-18	1154	1165	11	11	0.9%	0.9%	0.9%
24-Apr-18	1105	1125	20	20	1.8%	1.8%	1.8%
25-Apr-18	1055	1070	15	15	1.4%	1.4%	1.4%
26-Apr-18	958	985	27	27	2.9%	2.9%	2.8%
27-Apr-18	932	965	33	33	3.6%	3.6%	3.4%
28-Apr-18	850	910	60	60	7.1%	7.1%	6.6%
29-Apr-18	863	875	12	12	1.4%	1.4%	1.4%
30-Apr-18	982	1010	28	28	2.8%	2.8%	2.7%
Minimum	850	875	-49	4	-3.9%	0.3%	-4.1%
Average	1197	1227	30	37	2.6%	3.1%	2.4%
Maximum	1366	1430	118	118	10.6%	10.6%	9.6%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-May-18	1079	1060	-19	19	-1.8%	1.8%	-1.8%
2-May-18	909	975	66	66	7.3%	7.3%	6.8%
3-May-18	1120	1115	-5	5	-0.4%	0.4%	-0.4%
4-May-18	1170	1175	5	5	0.4%	0.4%	0.4%
5-May-18	1170	1135	-35	35	-3.0%	3.0%	-3.1%
6-May-18	945	1050	105	105	11.1%	11.1%	10.0%
7-May-18	1032	1040	8	8	0.8%	0.8%	0.8%
8-May-18	1031	1075	44	44	4.2%	4.2%	4.1%
9-May-18	997	1030	33	33	3.3%	3.3%	3.2%
10-May-18	1018	1045	27	27	2.7%	2.7%	2.6%
11-May-18	922	945	23	23	2.5%	2.5%	2.5%
12-May-18	935	990	55	55	5.8%	5.8%	5.5%
13-May-18	938	975	37	37	4.0%	4.0%	3.8%
14-May-18	966	985	19	19	2.0%	2.0%	2.0%
15-May-18	873	900	27	27	3.1%	3.1%	3.0%
16-May-18	894	965	71	71	8.0%	8.0%	7.4%
17-May-18	974	1005	31	31	3.2%	3.2%	3.1%
18-May-18	968	1005	37	37	3.8%	3.8%	3.7%
19-May-18	891	985	94	94	10.5%	10.5%	9.5%
20-May-18	934	965	31	31	3.3%	3.3%	3.2%
21-May-18	876	895	19	19	2.1%	2.1%	2.1%
22-May-18	948	965	17	17	1.8%	1.8%	1.7%
23-May-18	969	990	21	21	2.2%	2.2%	2.2%
24-May-18	1030	1085	55	55	5.4%	5.4%	5.1%
25-May-18	1070	1110	40	40	3.7%	3.7%	3.6%
26-May-18	1031	1020	-11	11	-1.0%	1.0%	-1.0%
27-May-18	1048	1045	-3	3	-0.3%	0.3%	-0.3%
28-May-18	987	1005	18	18	1.8%	1.8%	1.7%
29-May-18	906	965	59	59	6.5%	6.5%	6.1%
30-May-18	1121	1065	-56	56	-5.0%	5.0%	-5.3%
31-May-18	1119	1125	6	6	0.6%	0.6%	0.6%
Minimum	873	895	-56	3	-5.0%	0.3%	-5.3%
Average	996	1022	26	35	2.9%	3.6%	2.7%
Maximum	1170	1175	105	105	11.1%	11.1%	10.0%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Jun-18	1027	1035	8	8	0.8%	0.8%	0.8%
2-Jun-18	898	915	17	17	1.9%	1.9%	1.9%
3-Jun-18	1131	1135	4	4	0.4%	0.4%	0.4%
4-Jun-18	1200	1220	20	20	1.6%	1.6%	1.6%
5-Jun-18	1033	1065	32	32	3.1%	3.1%	3.0%
6-Jun-18	1053	1080	27	27	2.6%	2.6%	2.5%
7-Jun-18	1010	1045	35	35	3.4%	3.4%	3.3%
8-Jun-18	903	935	32	32	3.6%	3.6%	3.4%
9-Jun-18	921	915	-6	6	-0.7%	0.7%	-0.7%
10-Jun-18	872	935	63	63	7.3%	7.3%	6.8%
11-Jun-18	917	940	23	23	2.5%	2.5%	2.4%
12-Jun-18	992	995	3	3	0.3%	0.3%	0.3%
13-Jun-18	983	970	-13	13	-1.3%	1.3%	-1.3%
14-Jun-18	995	1015	20	20	2.0%	2.0%	1.9%
15-Jun-18	987	980	-7	7	-0.7%	0.7%	-0.7%
16-Jun-18	829	935	106	106	12.8%	12.8%	11.4%
17-Jun-18	957	970	13	13	1.3%	1.3%	1.3%
18-Jun-18	993	995	2	2	0.2%	0.2%	0.2%
19-Jun-18	917	930	13	13	1.5%	1.5%	1.4%
20-Jun-18	851	875	24	24	2.8%	2.8%	2.7%
21-Jun-18	794	815	21	21	2.7%	2.7%	2.6%
22-Jun-18	856	830	-26	26	-3.1%	3.1%	-3.2%
23-Jun-18	769	800	31	31	4.1%	4.1%	3.9%
24-Jun-18	822	810	-12	12	-1.5%	1.5%	-1.5%
25-Jun-18	976	955	-21	21	-2.2%	2.2%	-2.2%
26-Jun-18	1110	1070	-40	40	-3.6%	3.6%	-3.8%
27-Jun-18	953	1010	57	57	5.9%	5.9%	5.6%
28-Jun-18	810	855	45	45	5.5%	5.5%	5.2%
29-Jun-18	784	805	21	21	2.6%	2.6%	2.6%
30-Jun-18	769	780	11	11	1.4%	1.4%	1.4%
Minimum	769	780	-40	2	-3.6%	0.2%	-3.8%
Average	937	954	17	25	1.9%	2.8%	1.8%
Maximum	1200	1220	106	106	12.8%	12.8%	11.4%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Jul-18	782	815	33	33	4.2%	4.2%	4.0%
2-Jul-18	752	830	78	78	10.4%	10.4%	9.4%
3-Jul-18	795	810	15	15	1.9%	1.9%	1.8%
4-Jul-18	826	790	-36	36	-4.4%	4.4%	-4.6%
5-Jul-18	716	795	79	79	11.1%	11.1%	10.0%
6-Jul-18	730	785	55	55	7.6%	7.6%	7.1%
7-Jul-18	714	765	51	51	7.1%	7.1%	6.6%
8-Jul-18	709	750	41	41	5.8%	5.8%	5.5%
9-Jul-18	805	795	-10	10	-1.2%	1.2%	-1.2%
10-Jul-18	733	780	47	47	6.5%	6.5%	6.1%
11-Jul-18	704	770	66	66	9.4%	9.4%	8.6%
12-Jul-18	783	785	2	2	0.3%	0.3%	0.3%
13-Jul-18	742	780	38	38	5.2%	5.2%	4.9%
14-Jul-18	727	760	33	33	4.5%	4.5%	4.3%
15-Jul-18	755	755	0	0	0.0%	0.0%	0.0%
16-Jul-18	753	785	32	32	4.2%	4.2%	4.1%
17-Jul-18	739	790	51	51	6.9%	6.9%	6.4%
18-Jul-18	760	775	15	15	1.9%	1.9%	1.9%
19-Jul-18	786	790	4	4	0.5%	0.5%	0.5%
20-Jul-18	773	795	22	22	2.9%	2.9%	2.8%
21-Jul-18	723	755	32	32	4.4%	4.4%	4.2%
22-Jul-18	752	755	3	3	0.4%	0.4%	0.4%
23-Jul-18	785	800	15	15	1.9%	1.9%	1.9%
24-Jul-18	746	815	69	69	9.3%	9.3%	8.5%
25-Jul-18	782	795	13	13	1.7%	1.7%	1.7%
26-Jul-18	755	810	55	55	7.3%	7.3%	6.8%
27-Jul-18	771	800	29	29	3.8%	3.8%	3.7%
28-Jul-18	727	765	38	38	5.2%	5.2%	4.9%
29-Jul-18	704	755	51	51	7.2%	7.2%	6.7%
30-Jul-18	765	800	35	35	4.6%	4.6%	4.4%
31-Jul-18	757	790	33	33	4.3%	4.3%	4.2%
Minimum	704	750	-36	0	-4.4%	0.0%	-4.6%
Average	753	785	32	35	4.4%	4.7%	4.1%
Maximum	826	830	79	79	11.1%	11.1%	10.0%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/ Forecast
1-Aug-18	746	790	44	44	5.9%	5.9%	5.5%
2-Aug-18	733	800	67	67	9.1%	9.1%	8.3%
3-Aug-18	751	785	34	34	4.5%	4.5%	4.3%
4-Aug-18	704	765	61	61	8.7%	8.7%	8.0%
5-Aug-18	709	765	56	56	7.8%	7.8%	7.3%
6-Aug-18	736	800	64	64	8.7%	8.7%	8.0%
7-Aug-18	772	775	3	3	0.4%	0.4%	0.4%
8-Aug-18	800	780	-20	20	-2.5%	2.5%	-2.6%
9-Aug-18	705	785	80	80	11.3%	11.3%	10.1%
10-Aug-18	745	790	45	45	6.1%	6.1%	5.7%
11-Aug-18	689	745	56	56	8.1%	8.1%	7.5%
12-Aug-18	691	755	64	64	9.3%	9.3%	8.5%
13-Aug-18	742	785	43	43	5.8%	5.8%	5.4%
14-Aug-18	719	790	71	71	9.8%	9.8%	8.9%
15-Aug-18	724	765	41	41	5.6%	5.6%	5.3%
16-Aug-18	737	795	58	58	7.9%	7.9%	7.3%
17-Aug-18	724	795	71	71	9.8%	9.8%	9.0%
18-Aug-18	668	720	52	52	7.9%	7.9%	7.3%
19-Aug-18	674	725	51	51	7.6%	7.6%	7.0%
20-Aug-18	720	775	55	55	7.7%	7.7%	7.1%
21-Aug-18	705	775	70	70	9.9%	9.9%	9.0%
22-Aug-18	714	770	56	56	7.9%	7.9%	7.3%
23-Aug-18	747	755	8	8	1.1%	1.1%	1.1%
24-Aug-18	749	760	11	11	1.5%	1.5%	1.5%
25-Aug-18	702	735	33	33	4.7%	4.7%	4.5%
26-Aug-18	702	735	33	33	4.8%	4.8%	4.5%
27-Aug-18	758	775	17	17	2.2%	2.2%	2.2%
28-Aug-18	744	780	36	36	4.8%	4.8%	4.6%
29-Aug-18	761	780	19	19	2.5%	2.5%	2.4%
30-Aug-18	747	780	33	33	4.4%	4.4%	4.2%
31-Aug-18	763	780	17	17	2.3%	2.3%	2.2%
Minimum	668	720	-20	3	-2.5%	0.4%	-2.6%
Average	728	771	43	44	6.0%	6.1%	5.5%
Maximum	800	800	80	80	11.3%	11.3%	10.1%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Sep-18	710	755	45	45	6.4%	6.4%	6.0%
2-Sep-18	709	745	36	36	5.1%	5.1%	4.9%
3-Sep-18	695	765	70	70	10.0%	10.0%	9.1%
4-Sep-18	754	770	16	16	2.1%	2.1%	2.0%
5-Sep-18	718	755	37	37	5.2%	5.2%	4.9%
6-Sep-18	747	770	23	23	3.1%	3.1%	3.0%
7-Sep-18	688	765	77	77	11.1%	11.1%	10.0%
8-Sep-18	682	745	63	63	9.2%	9.2%	8.4%
9-Sep-18	712	755	43	43	6.1%	6.1%	5.8%
10-Sep-18	725	780	55	55	7.6%	7.6%	7.1%
11-Sep-18	740	775	35	35	4.7%	4.7%	4.5%
12-Sep-18	800	785	-15	15	-1.9%	1.9%	-1.9%
13-Sep-18	761	770	9	9	1.2%	1.2%	1.2%
14-Sep-18	771	795	24	24	3.1%	3.1%	3.0%
15-Sep-18	778	740	-38	38	-4.9%	4.9%	-5.2%
16-Sep-18	768	765	-3	3	-0.4%	0.4%	-0.4%
17-Sep-18	809	825	16	16	1.9%	1.9%	1.9%
18-Sep-18	927	930	3	3	0.3%	0.3%	0.3%
19-Sep-18	961	965	4	4	0.4%	0.4%	0.4%
20-Sep-18	921	940	19	19	2.0%	2.0%	2.0%
21-Sep-18	945	960	15	15	1.6%	1.6%	1.6%
22-Sep-18	942	875	-67	67	-7.1%	7.1%	-7.7%
23-Sep-18	812	845	33	33	4.0%	4.0%	3.9%
24-Sep-18	889	895	6	6	0.7%	0.7%	0.7%
25-Sep-18	953	985	32	32	3.3%	3.3%	3.2%
26-Sep-18	958	1020	62	62	6.5%	6.5%	6.1%
27-Sep-18	806	855	49	49	6.0%	6.0%	5.7%
28-Sep-18	835	875	40	40	4.8%	4.8%	4.6%
29-Sep-18	779	800	21	21	2.7%	2.7%	2.6%
30-Sep-18	821	865	44	44	5.3%	5.3%	5.0%
Minimum	682	740	-67	3	-7.1%	0.3%	-7.7%
Average	804	829	25	33	3.3%	4.3%	3.1%
Maximum	961	1020	77	77	11.1%	11.1%	10.0%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Total Peak, MW	Forecast Total Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Oct-18	901	915	14	14	1.6%	1.6%	1.5%
2-Oct-18	921	960	39	39	4.2%	4.2%	4.0%
3-Oct-18	999	1035	36	36	3.6%	3.6%	3.5%
4-Oct-18	877	915	38	38	4.4%	4.4%	4.2%
5-Oct-18	778	875	97	97	12.4%	12.4%	11.0%
6-Oct-18	815	855	40	40	4.8%	4.8%	4.6%
7-Oct-18	939	895	-44	44	-4.7%	4.7%	-4.9%
8-Oct-18	912	915	3	3	0.3%	0.3%	0.3%
9-Oct-18	1025	1040	15	15	1.4%	1.4%	1.4%
10-Oct-18	995	1030	35	35	3.6%	3.6%	3.4%
11-Oct-18	1086	1110	24	24	2.2%	2.2%	2.1%
12-Oct-18	1098	1130	32	32	2.9%	2.9%	2.9%
13-Oct-18	951	1005	54	54	5.7%	5.7%	5.4%
14-Oct-18	960	940	-20	20	-2.1%	2.1%	-2.1%
15-Oct-18	1029	1035	6	6	0.6%	0.6%	0.6%
16-Oct-18	1036	1030	-6	6	-0.6%	0.6%	-0.6%
17-Oct-18	989	1020	31	31	3.1%	3.1%	3.0%
18-Oct-18	1014	1020	6	6	0.6%	0.6%	0.6%
19-Oct-18	1065	1100	35	35	3.3%	3.3%	3.2%
20-Oct-18	1042	1035	-7	7	-0.7%	0.7%	-0.7%
21-Oct-18	916	950	34	34	3.7%	3.7%	3.6%
22-Oct-18	965	1000	35	35	3.6%	3.6%	3.5%
23-Oct-18	1062	1075	13	13	1.3%	1.3%	1.2%
24-Oct-18	1134	1140	6	6	0.5%	0.5%	0.5%
25-Oct-18	1024	1035	11	11	1.1%	1.1%	1.1%
26-Oct-18	1026	1040	14	14	1.4%	1.4%	1.4%
27-Oct-18	1072	1025	-47	47	-4.4%	4.4%	-4.6%
28-Oct-18	1141	1095	-46	46	-4.0%	4.0%	-4.2%
29-Oct-18	975	980	5	5	0.5%	0.5%	0.5%
30-Oct-18	864	955	91	91	10.5%	10.5%	9.5%
31-Oct-18	971	1045	74	74	7.6%	7.6%	7.0%
Minimum	778	855	-47	3	-4.7%	0.3%	-4.9%
Average	987	1006	20	31	2.2%	3.3%	2.0%
Maximum	1141	1140	97	97	12.4%	12.4%	11.0%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Peak, MW	Forecast Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Nov-18	1110	1085	-25	25	-2.3%	2.3%	-2.3%
2-Nov-18	1005	1045	40	40	4.0%	4.0%	3.8%
3-Nov-18	1028	1040	12	12	1.1%	1.1%	1.1%
4-Nov-18	1013	1140	127	127	12.5%	12.5%	11.1%
5-Nov-18	1095	1205	110	110	10.0%	10.0%	9.1%
6-Nov-18	1051	1275	224	224	21.3%	21.3%	17.6%
7-Nov-18	962	1130	168	168	17.5%	17.5%	14.9%
8-Nov-18	938	1090	152	152	16.2%	16.2%	13.9%
9-Nov-18	1007	1110	103	103	10.2%	10.2%	9.3%
10-Nov-18	1218	1145	-73	73	-6.0%	6.0%	-6.4%
11-Nov-18	1148	1185	37	37	3.2%	3.2%	3.1%
12-Nov-18	1215	1270	55	55	4.5%	4.5%	4.3%
13-Nov-18	1237	1275	38	38	3.1%	3.1%	3.0%
14-Nov-18	1330	1410	80	80	6.0%	6.0%	5.7%
15-Nov-18	1394	1425	31	31	2.2%	2.2%	2.2%
16-Nov-18	1338	1360	22	22	1.6%	1.6%	1.6%
17-Nov-18	1286	1330	44	44	3.4%	3.4%	3.3%
18-Nov-18	1280	1300	20	20	1.6%	1.6%	1.5%
19-Nov-18	1348	1370	22	22	1.6%	1.6%	1.6%
20-Nov-18	1301	1315	14	14	1.1%	1.1%	1.1%
21-Nov-18	1185	1260	75	75	6.3%	6.3%	6.0%
22-Nov-18	1283	1310	27	27	2.1%	2.1%	2.1%
23-Nov-18	1440	1500	60	60	4.2%	4.2%	4.0%
24-Nov-18	1457	1460	3	3	0.2%	0.2%	0.2%
25-Nov-18	1377	1345	-32	32	-2.3%	2.3%	-2.4%
26-Nov-18	1299	1300	1	1	0.1%	0.1%	0.1%
27-Nov-18	1324	1285	-39	39	-2.9%	2.9%	-3.0%
28-Nov-18	1319	1295	-24	24	-1.8%	1.8%	-1.9%
29-Nov-18	1261	1345	84	84	6.7%	6.7%	6.2%
30-Nov-18	1405	1310	-95	95	-6.8%	6.8%	-7.3%
Minimum	938	1040	-95	1	-6.8%	0.1%	-7.3%
Average	1222	1264	42	61	4.0%	5.4%	3.5%
Maximum	1457	1500	224	224	21.3%	21.3%	17.6%

Table 2 - Analysis of Total Forecast Error (continued)

Date	Actual Peak, MW	Forecast Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Dec-18	1270	1270	0	0	0.0%	0.0%	0.0%
2-Dec-18	1255	1275	20	20	1.6%	1.6%	1.6%
3-Dec-18	1345	1360	15	15	1.1%	1.1%	1.1%
4-Dec-18	1323	1310	-13	13	-1.0%	1.0%	-1.0%
5-Dec-18	1466	1455	-11	11	-0.8%	0.8%	-0.8%
6-Dec-18	1484	1465	-19	19	-1.3%	1.3%	-1.3%
7-Dec-18	1393	1470	77	77	5.5%	5.5%	5.2%
8-Dec-18	1410	1330	-80	80	-5.7%	5.7%	-6.0%
9-Dec-18	1506	1430	-76	76	-5.0%	5.0%	-5.3%
10-Dec-18	1432	1435	3	3	0.2%	0.2%	0.2%
11-Dec-18	1487	1445	-42	42	-2.8%	2.8%	-2.9%
12-Dec-18	1449	1435	-14	14	-1.0%	1.0%	-1.0%
13-Dec-18	1502	1495	-7	7	-0.5%	0.5%	-0.5%
14-Dec-18	1459	1460	1	1	0.1%	0.1%	0.1%
15-Dec-18	1349	1390	41	41	3.0%	3.0%	2.9%
16-Dec-18	1391	1405	14	14	1.0%	1.0%	1.0%
17-Dec-18	1420	1395	-25	25	-1.8%	1.8%	-1.8%
18-Dec-18	1293	1425	132	132	10.2%	10.2%	9.3%
19-Dec-18	1349	1380	31	31	2.3%	2.3%	2.2%
20-Dec-18	1449	1425	-24	24	-1.7%	1.7%	-1.7%
21-Dec-18	1364	1390	26	26	1.9%	1.9%	1.9%
22-Dec-18	1326	1310	-16	16	-1.2%	1.2%	-1.2%
23-Dec-18	1242	1300	58	58	4.7%	4.7%	4.5%
24-Dec-18	1438	1470	32	32	2.2%	2.2%	2.2%
25-Dec-18	1417	1495	78	78	5.5%	5.5%	5.2%
26-Dec-18	1448	1525	77	77	5.3%	5.3%	5.0%
27-Dec-18	1506	1495	-11	11	-0.7%	0.7%	-0.7%
28-Dec-18	1583	1595	12	12	0.8%	0.8%	0.8%
29-Dec-18	1549	1540	-9	9	-0.6%	0.6%	-0.6%
30-Dec-18	1421	1400	-21	21	-1.5%	1.5%	-1.5%
31-Dec-18	1627	1570	-57	57	-3.5%	3.5%	-3.6%
Minimum	1242	1270	-80	0	-5.7%	0.0%	-6.0%
Average	1418	1424	6	34	0.5%	2.4%	0.4%
Maximum	1627	1595	132	132	10.2%	10.2%	9.3%

Note:

Shading means further examination of the hourly forecast was provided in this report.

Table 3 - Analysis of Utility Forecast Error

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/ Forecast
1-Nov-17	764	752	-12	12	-1.6%	1.6%	-1.6%
2-Nov-17	871	855	-15	15	-1.8%	1.8%	-1.8%
3-Nov-17	874	869	-5	5	-0.5%	0.5%	-0.6%
4-Nov-17	803	857	54	54	6.8%	6.8%	6.3%
5-Nov-17	955	1016	61	61	6.4%	6.4%	6.0%
6-Nov-17	990	1006	16	16	1.6%	1.6%	1.6%
7-Nov-17	879	935	56	56	6.4%	6.4%	6.0%
8-Nov-17	990	990	1	1	0.1%	0.1%	0.1%
9-Nov-17	678	628	-50	50	-7.4%	7.4%	-8.0%
10-Nov-17	946	957	10	10	1.1%	1.1%	1.1%
11-Nov-17	1071	945	-126	126	-11.7%	11.7%	-13.3%
12-Nov-17	978	1023	46	46	4.7%	4.7%	4.5%
13-Nov-17	1009	1029	19	19	1.9%	1.9%	1.9%
14-Nov-17	1060	1131	71	71	6.7%	6.7%	6.3%
15-Nov-17	1109	1070	-39	39	-3.5%	3.5%	-3.7%
16-Nov-17	1120	1135	15	15	1.3%	1.3%	1.3%
17-Nov-17	1083	1079	-4	4	-0.4%	0.4%	-0.4%
18-Nov-17	953	957	4	4	0.5%	0.5%	0.5%
19-Nov-17	729	750	21	21	2.9%	2.9%	2.8%
20-Nov-17	938	950	13	13	1.4%	1.4%	1.3%
21-Nov-17	1122	1148	26	26	2.3%	2.3%	2.3%
22-Nov-17	1096	1109	13	13	1.2%	1.2%	1.2%
23-Nov-17	1043	1101	58	58	5.5%	5.5%	5.2%
24-Nov-17	1039	1112	73	73	7.1%	7.1%	6.6%
25-Nov-17	995	1065	70	70	7.1%	7.1%	6.6%
26-Nov-17	982	1013	31	31	3.1%	3.1%	3.0%
27-Nov-17	1047	1107	59	59	5.7%	5.7%	5.3%
28-Nov-17	1160	1204	44	44	3.8%	3.8%	3.7%
29-Nov-17	1170	1156	-15	15	-1.2%	1.2%	-1.3%
30-Nov-17	1170	1216	46	46	4.0%	4.0%	3.8%
Minimum	678	628	-126	1	-11.7%	0.1%	-13.3%
Average	987	1006	18	36	1.8%	3.7%	1.6%
Maximum	1170	1216	73	126	7.1%	11.7%	6.6%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Dec-17	1146	1146	1	1	0.1%	0.1%	0.1%
2-Dec-17	1083	1150	67	67	6.2%	6.2%	5.8%
3-Dec-17	1127	1182	55	55	4.9%	4.9%	4.6%
4-Dec-17	1183	1213	30	30	2.5%	2.5%	2.5%
5-Dec-17	1178	1200	22	22	1.9%	1.9%	1.8%
6-Dec-17	1135	1112	-23	23	-2.0%	2.0%	-2.1%
7-Dec-17	1081	1133	51	51	4.7%	4.7%	4.5%
8-Dec-17	1147	1189	42	42	3.7%	3.7%	3.5%
9-Dec-17	678	628	-50	50	-7.4%	7.4%	-8.0%
10-Dec-17	987	1042	55	55	5.6%	5.6%	5.3%
11-Dec-17	1138	1200	62	62	5.5%	5.5%	5.2%
12-Dec-17	1191	1242	51	51	4.3%	4.3%	4.1%
13-Dec-17	1120	1133	13	13	1.2%	1.2%	1.2%
14-Dec-17	1136	1180	45	45	3.9%	3.9%	3.8%
15-Dec-17	1278	1236	-42	42	-3.3%	3.3%	-3.4%
16-Dec-17	1291	1240	-50	50	-3.9%	3.9%	-4.1%
17-Dec-17	1316	1325	9	9	0.7%	0.7%	0.7%
18-Dec-17	1392	1420	27	27	2.0%	2.0%	1.9%
19-Dec-17	729	750	21	21	2.9%	2.9%	2.8%
20-Dec-17	1176	1228	52	52	4.4%	4.4%	4.2%
21-Dec-17	1287	1298	11	11	0.9%	0.9%	0.9%
22-Dec-17	1295	1349	54	54	4.2%	4.2%	4.0%
23-Dec-17	1273	1258	-14	14	-1.1%	1.1%	-1.1%
24-Dec-17	1126	1256	130	130	11.5%	11.5%	10.3%
25-Dec-17	1258	1345	87	87	6.9%	6.9%	6.5%
26-Dec-17	1383	1367	-17	17	-1.2%	1.2%	-1.2%
27-Dec-17	1511	1456	-55	55	-3.6%	3.6%	-3.7%
28-Dec-17	1416	1349	-67	67	-4.7%	4.7%	-4.9%
29-Dec-17	1298	1360	62	62	4.8%	4.8%	4.6%
30-Dec-17	1346	1281	-65	65	-4.8%	4.8%	-5.1%
31-Dec-17	1301	1335	34	34	2.6%	2.6%	2.5%
Minimum	678	628	-67	1	-7.4%	0.1%	-8.0%
Average	1194	1213	19	44	1.7%	3.8%	1.5%
Maximum	1511	1456	130	130	11.5%	11.5%	10.3%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Jan-18	1252	1340	88	88	7.0%	7.0%	6.6%
2-Jan-18	1275	1372	96	96	7.6%	7.6%	7.0%
3-Jan-18	1377	1352	-25	25	-1.8%	1.8%	-1.8%
4-Jan-18	1363	1329	-35	35	-2.5%	2.5%	-2.6%
5-Jan-18	1085	1106	21	21	1.9%	1.9%	1.9%
6-Jan-18	1331	1351	19	19	1.4%	1.4%	1.4%
7-Jan-18	1444	1449	5	5	0.3%	0.3%	0.3%
8-Jan-18	1459	1442	-17	17	-1.2%	1.2%	-1.2%
9-Jan-18	1356	1369	13	13	1.0%	1.0%	1.0%
10-Jan-18	1461	1452	-10	10	-0.7%	0.7%	-0.7%
11-Jan-18	1436	1420	-17	17	-1.2%	1.2%	-1.2%
12-Jan-18	1072	1188	116	116	10.9%	10.9%	9.8%
13-Jan-18	918	1028	110	110	12.0%	12.0%	10.7%
14-Jan-18	1036	1124	88	88	8.5%	8.5%	7.9%
15-Jan-18	1345	1366	22	22	1.6%	1.6%	1.6%
16-Jan-18	1327	1368	41	41	3.1%	3.1%	3.0%
17-Jan-18	1278	1320	42	42	3.2%	3.2%	3.1%
18-Jan-18	1218	1230	12	12	1.0%	1.0%	1.0%
19-Jan-18	1246	1233	-13	13	-1.0%	1.0%	-1.0%
20-Jan-18	1297	1321	24	24	1.9%	1.9%	1.8%
21-Jan-18	1290	1370	80	80	6.2%	6.2%	5.8%
22-Jan-18	1458	1449	-9	9	-0.6%	0.6%	-0.6%
23-Jan-18	1424	1417	-7	7	-0.5%	0.5%	-0.5%
24-Jan-18	1208	1240	32	32	2.7%	2.7%	2.6%
25-Jan-18	1291	1317	27	27	2.1%	2.1%	2.0%
26-Jan-18	1303	1305	2	2	0.2%	0.2%	0.2%
27-Jan-18	1298	1478	180	180	13.9%	13.9%	12.2%
28-Jan-18	1172	1283	111	111	9.5%	9.5%	8.7%
29-Jan-18	1206	1245	39	39	3.3%	3.3%	3.2%
30-Jan-18	1335	1311	-25	25	-1.9%	1.9%	-1.9%
31-Jan-18	1277	1306	29	29	2.3%	2.3%	2.2%
Minimum	918	1028	-35	2	-2.5%	0.2%	-2.6%
Average	1285	1319	34	44	2.9%	3.6%	2.7%
Maximum	1461	1478	180	180	13.9%	13.9%	12.2%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Feb-18	1287	1283	-3	3	-0.2%	0.2%	-0.2%
2-Feb-18	1052	1100	47	47	4.5%	4.5%	4.3%
3-Feb-18	1347	1373	26	26	1.9%	1.9%	1.9%
4-Feb-18	1351	1343	-8	8	-0.6%	0.6%	-0.6%
5-Feb-18	1254	1285	31	31	2.4%	2.4%	2.4%
6-Feb-18	1190	1255	64	64	5.4%	5.4%	5.1%
7-Feb-18	1251	1259	8	8	0.7%	0.7%	0.6%
8-Feb-18	1147	1220	72	72	6.3%	6.3%	5.9%
9-Feb-18	1294	1313	18	18	1.4%	1.4%	1.4%
10-Feb-18	1297	1282	-15	15	-1.1%	1.1%	-1.1%
11-Feb-18	1141	1231	90	90	7.9%	7.9%	7.3%
12-Feb-18	1224	1212	-12	12	-1.0%	1.0%	-1.0%
13-Feb-18	1427	1495	68	68	4.7%	4.7%	4.5%
14-Feb-18	1450	1481	31	31	2.2%	2.2%	2.1%
15-Feb-18	1205	1194	-11	11	-0.9%	0.9%	-0.9%
16-Feb-18	1149	1163	14	14	1.2%	1.2%	1.2%
17-Feb-18	1373	1433	61	61	4.4%	4.4%	4.2%
18-Feb-18	1325	1351	26	26	2.0%	2.0%	1.9%
19-Feb-18	1284	1308	25	25	1.9%	1.9%	1.9%
20-Feb-18	1234	1350	116	116	9.4%	9.4%	8.6%
21-Feb-18	1340	1348	9	9	0.7%	0.7%	0.7%
22-Feb-18	1308	1410	102	102	7.8%	7.8%	7.2%
23-Feb-18	1454	1477	24	24	1.6%	1.6%	1.6%
24-Feb-18	1291	1306	15	15	1.2%	1.2%	1.2%
25-Feb-18	1305	1367	61	61	4.7%	4.7%	4.5%
26-Feb-18	1441	1451	9	9	0.6%	0.6%	0.6%
27-Feb-18	1224	1256	32	32	2.6%	2.6%	2.6%
28-Feb-18	1171	1185	14	14	1.2%	1.2%	1.2%
Minimum	1052	1100	-15	3	-1.1%	0.2%	-1.1%
Average	1279	1312	33	36	2.6%	2.9%	2.5%
Maximum	1454	1495	116	116	9.4%	9.4%	8.6%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Mar-18	1156	1153	-3	3	-0.2%	0.2%	-0.2%
2-Mar-18	1083	1110	27	27	2.5%	2.5%	2.4%
3-Mar-18	1104	1113	9	9	0.8%	0.8%	0.8%
4-Mar-18	1071	1126	55	55	5.1%	5.1%	4.9%
5-Mar-18	1150	1175	25	25	2.2%	2.2%	2.2%
6-Mar-18	1208	1228	20	20	1.7%	1.7%	1.7%
7-Mar-18	1198	1203	5	5	0.4%	0.4%	0.4%
8-Mar-18	1165	1163	-3	3	-0.2%	0.2%	-0.2%
9-Mar-18	1117	1166	49	49	4.4%	4.4%	4.2%
10-Mar-18	1104	1126	22	22	2.0%	2.0%	2.0%
11-Mar-18	1077						
12-Mar-18	1121	1149	28	28	2.5%	2.5%	2.4%
13-Mar-18	1112	1113	1	1	0.1%	0.1%	0.1%
14-Mar-18	1156	1152	-4	4	-0.3%	0.3%	-0.3%
15-Mar-18	1114	1093	-21	21	-1.9%	1.9%	-1.9%
16-Mar-18	1077	1087	10	10	0.9%	0.9%	0.9%
17-Mar-18	1023	1045	23	23	2.2%	2.2%	2.2%
18-Mar-18	1139	1150	11	11	1.0%	1.0%	1.0%
19-Mar-18	1229	1204	-25	25	-2.0%	2.0%	-2.1%
20-Mar-18	1210	1216	7	7	0.5%	0.5%	0.5%
21-Mar-18	1175	1181	6	6	0.5%	0.5%	0.5%
22-Mar-18	1189	1158	-31	31	-2.6%	2.6%	-2.7%
23-Mar-18	1103	1104	1	1	0.1%	0.1%	0.1%
24-Mar-18	1096	1101	4	4	0.4%	0.4%	0.4%
25-Mar-18	1209	1236	27	27	2.2%	2.2%	2.2%
26-Mar-18	1300						
27-Mar-18	1218	1236	18	18	1.4%	1.4%	1.4%
28-Mar-18	1146	1128	-18	18	-1.6%	1.6%	-1.6%
29-Mar-18	1035	1030	-5	5	-0.5%	0.5%	-0.5%
30-Mar-18	1009	1086	77	77	7.6%	7.6%	7.0%
31-Mar-18	992	953	-39	39	-4.0%	4.0%	-4.1%
Minimum	992	953	-39	1	-4.0%	0.1%	-4.1%
Average	1132	1137	10	20	0.9%	1.8%	0.8%
Maximum	1300	1236	77	77	7.6%	7.6%	7.0%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/ Forecast
1-Apr-18	1110	1098	-12	12	-1.1%	1.1%	-1.1%
2-Apr-18	1000	1085	86	86	8.6%	8.6%	7.9%
3-Apr-18	1109	1110	1	1	0.1%	0.1%	0.1%
4-Apr-18	1163	1183	20	20	1.7%	1.7%	1.7%
5-Apr-18	1097	1045	-52	52	-4.7%	4.7%	-4.9%
6-Apr-18	1191	1154	-36	36	-3.1%	3.1%	-3.1%
7-Apr-18	1203	1187	-16	16	-1.3%	1.3%	-1.3%
8-Apr-18	1084	1090	7	7	0.6%	0.6%	0.6%
9-Apr-18	1152	1212	61	61	5.3%	5.3%	5.0%
10-Apr-18	1157	1191	34	34	2.9%	2.9%	2.9%
11-Apr-18	1150	1163	12	12	1.1%	1.1%	1.1%
12-Apr-18	1170	1146	-24	24	-2.1%	2.1%	-2.1%
13-Apr-18	1119	1138	19	19	1.7%	1.7%	1.6%
14-Apr-18	1109	1112	3	3	0.3%	0.3%	0.3%
15-Apr-18	1170	1248	78	78	6.7%	6.7%	6.2%
16-Apr-18	1142	1157	15	15	1.3%	1.3%	1.3%
17-Apr-18	1113	1134	21	21	1.9%	1.9%	1.9%
18-Apr-18	1114	1082	-32	32	-2.9%	2.9%	-3.0%
19-Apr-18	1032	1015	-17	17	-1.6%	1.6%	-1.7%
20-Apr-18	1073	1015	-58	58	-5.4%	5.4%	-5.8%
21-Apr-18	974	1049	75	75	7.7%	7.7%	7.2%
22-Apr-18	942	1051	109	109	11.6%	11.6%	10.4%
23-Apr-18	965	981	15	15	1.6%	1.6%	1.6%
24-Apr-18	922	942	21	21	2.3%	2.3%	2.2%
25-Apr-18	868	887	19	19	2.2%	2.2%	2.1%
26-Apr-18	782	801	19	19	2.4%	2.4%	2.3%
27-Apr-18	781	781	0	0	0.0%	0.0%	0.0%
28-Apr-18	713	737	24	24	3.3%	3.3%	3.2%
29-Apr-18	697	704	6	6	0.9%	0.9%	0.9%
30-Apr-18	814	835	22	22	2.6%	2.6%	2.6%
Minimum	697	704	-58	0	-5.4%	0.0%	-5.8%
Average	1031	1044	14	30	1.5%	3.0%	1.3%
Maximum	1203	1248	109	109	11.6%	11.6%	10.4%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-May-18	911	889	-23	23	-2.5%	2.5%	-2.6%
2-May-18	792	805	14	14	1.8%	1.8%	1.7%
3-May-18	970	945	-26	26	-2.6%	2.6%	-2.7%
4-May-18	1021	1006	-14	14	-1.4%	1.4%	-1.4%
5-May-18	1021	965	-56	56	-5.5%	5.5%	-5.8%
6-May-18	791	879	88	88	11.1%	11.1%	10.0%
7-May-18	885	872	-13	13	-1.5%	1.5%	-1.5%
8-May-18	878	905	27	27	3.1%	3.1%	3.0%
9-May-18	855	872	17	17	2.0%	2.0%	1.9%
10-May-18	876	887	12	12	1.4%	1.4%	1.3%
11-May-18	773	782	9	9	1.2%	1.2%	1.2%
12-May-18	787	823	36	36	4.6%	4.6%	4.4%
13-May-18	797	804	7	7	0.9%	0.9%	0.9%
14-May-18	813	817	3	3	0.4%	0.4%	0.4%
15-May-18	740	731	-9	9	-1.2%	1.2%	-1.2%
16-May-18	740	794	55	55	7.4%	7.4%	6.9%
17-May-18	831	836	6	6	0.7%	0.7%	0.7%
18-May-18	820	836	16	16	1.9%	1.9%	1.9%
19-May-18	750	818	68	68	9.0%	9.0%	8.3%
20-May-18	783	811	28	28	3.6%	3.6%	3.4%
21-May-18	719	746	27	27	3.7%	3.7%	3.6%
22-May-18	838	813	-25	25	-2.9%	2.9%	-3.0%
23-May-18	839	835	-4	4	-0.5%	0.5%	-0.5%
24-May-18	914	929	14	14	1.6%	1.6%	1.5%
25-May-18	934	965	31	31	3.3%	3.3%	3.2%
26-May-18	845	874	30	30	3.5%	3.5%	3.4%
27-May-18	903	893	-10	10	-1.1%	1.1%	-1.1%
28-May-18	841	852	12	12	1.4%	1.4%	1.4%
29-May-18	776	797	21	21	2.7%	2.7%	2.7%
30-May-18	971	890	-81	81	-8.3%	8.3%	-9.1%
31-May-18	963	950	-13	13	-1.4%	1.4%	-1.4%
Minimum	719	731	-81	3	-8.3%	0.4%	-9.1%
Average	851	859	8	26	1.2%	3.0%	1.0%
Maximum	1021	1006	88	88	11.1%	11.1%	10.0%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Jun-18	870	862	-8	8	-0.9%	0.9%	-1.0%
2-Jun-18	749	743	-7	7	-0.9%	0.9%	-0.9%
3-Jun-18	965	961	-4	4	-0.4%	0.4%	-0.4%
4-Jun-18	1048	1047	-1	1	-0.1%	0.1%	-0.1%
5-Jun-18	863	889	27	27	3.1%	3.1%	3.0%
6-Jun-18	900	907	7	7	0.7%	0.7%	0.7%
7-Jun-18	865	872	7	7	0.8%	0.8%	0.8%
8-Jun-18	753	764	11	11	1.5%	1.5%	1.4%
9-Jun-18	782	743	-39	39	-5.0%	5.0%	-5.3%
10-Jun-18	704	763	59	59	8.4%	8.4%	7.7%
11-Jun-18	750	766	16	16	2.1%	2.1%	2.1%
12-Jun-18	826	822	-3	3	-0.4%	0.4%	-0.4%
13-Jun-18	815	795	-20	20	-2.5%	2.5%	-2.6%
14-Jun-18	840	843	3	3	0.4%	0.4%	0.4%
15-Jun-18	820	807	-13	13	-1.6%	1.6%	-1.7%
16-Jun-18	688	764	76	76	11.1%	11.1%	10.0%
17-Jun-18	799	795	-4	4	-0.5%	0.5%	-0.5%
18-Jun-18	827	822	-5	5	-0.6%	0.6%	-0.6%
19-Jun-18	770	757	-13	13	-1.7%	1.7%	-1.7%
20-Jun-18	690	702	12	12	1.7%	1.7%	1.7%
21-Jun-18	660	640	-20	20	-3.1%	3.1%	-3.1%
22-Jun-18	640	648	8	8	1.2%	1.2%	1.2%
23-Jun-18	597	612	15	15	2.5%	2.5%	2.5%
24-Jun-18	652	624	-29	29	-4.4%	4.4%	-4.6%
25-Jun-18	815	768	-47	47	-5.8%	5.8%	-6.1%
26-Jun-18	940	885	-55	55	-5.8%	5.8%	-6.2%
27-Jun-18	793	823	30	30	3.8%	3.8%	3.7%
28-Jun-18	665	668	3	3	0.5%	0.5%	0.5%
29-Jun-18	607	616	10	10	1.6%	1.6%	1.6%
30-Jun-18	588	594	6	6	1.1%	1.1%	1.1%
Minimum	588	594	-55	1	-5.8%	0.1%	-6.2%
Average	776	777	1	19	0.2%	2.5%	0.1%
Maximum	1048	1047	76	76	11.1%	11.1%	10.0%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Jul-18	624	630	5	5	0.9%	0.9%	0.9%
2-Jul-18	599	641	41	41	6.9%	6.9%	6.4%
3-Jul-18	603	624	21	21	3.5%	3.5%	3.4%
4-Jul-18	588	601	13	13	2.2%	2.2%	2.1%
5-Jul-18	577	605	29	29	5.0%	5.0%	4.8%
6-Jul-18	582	597	15	15	2.6%	2.6%	2.5%
7-Jul-18	565	605	40	40	7.1%	7.1%	6.6%
8-Jul-18	557	562	5	5	0.9%	0.9%	0.9%
9-Jul-18	579	608	29	29	5.1%	5.1%	4.8%
10-Jul-18	579	619	40	40	6.8%	6.8%	6.4%
11-Jul-18	588	583	-5	5	-0.9%	0.9%	-0.9%
12-Jul-18	606	596	-10	10	-1.6%	1.6%	-1.6%
13-Jul-18	583	595	12	12	2.1%	2.1%	2.1%
14-Jul-18	566	572	6	6	1.0%	1.0%	1.0%
15-Jul-18	585	569	-16	16	-2.7%	2.7%	-2.8%
16-Jul-18	617	599	-18	18	-3.0%	3.0%	-3.1%
17-Jul-18	604	600	-4	4	-0.7%	0.7%	-0.7%
18-Jul-18	601	587	-13	13	-2.2%	2.2%	-2.3%
19-Jul-18	612	603	-9	9	-1.5%	1.5%	-1.5%
20-Jul-18	593	605	12	12	2.1%	2.1%	2.0%
21-Jul-18	557	566	9	9	1.6%	1.6%	1.5%
22-Jul-18	574	566	-9	9	-1.5%	1.5%	-1.6%
23-Jul-18	625	613	-12	12	-1.9%	1.9%	-1.9%
24-Jul-18	606	628	22	22	3.6%	3.6%	3.5%
25-Jul-18	609	605	-4	4	-0.6%	0.6%	-0.6%
26-Jul-18	601	623	21	21	3.5%	3.5%	3.4%
27-Jul-18	608	610	2	2	0.4%	0.4%	0.4%
28-Jul-18	570	579	9	9	1.5%	1.5%	1.5%
29-Jul-18	571	567	-3	3	-0.6%	0.6%	-0.6%
30-Jul-18	616	615	-2	2	-0.3%	0.3%	-0.3%
31-Jul-18	601	601	0	0	0.0%	0.0%	0.0%
Minimum	557	562	-18	0	-3.0%	0.0%	-3.1%
Average	592	599	7	14	1.3%	2.4%	1.2%
Maximum	625	641	41	41	7.1%	7.1%	6.6%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Aug-18	582	613	31	31	5.3%	5.3%	5.0%
2-Aug-18	608	616	8	8	1.3%	1.3%	1.3%
3-Aug-18	610	597	-13	13	-2.1%	2.1%	-2.1%
4-Aug-18	555	577	23	23	4.1%	4.1%	3.9%
5-Aug-18	555	578	24	24	4.2%	4.2%	4.1%
6-Aug-18	589	613	24	24	4.1%	4.1%	3.9%
7-Aug-18	590	591	1	1	0.1%	0.1%	0.1%
8-Aug-18	600	594	-6	6	-0.9%	0.9%	-0.9%
9-Aug-18	567	596	30	30	5.3%	5.3%	5.0%
10-Aug-18	601	602	1	1	0.2%	0.2%	0.2%
11-Aug-18	551	560	9	9	1.6%	1.6%	1.6%
12-Aug-18	531	566	35	35	6.6%	6.6%	6.2%
13-Aug-18	586	602	15	15	2.6%	2.6%	2.5%
14-Aug-18	587	601	14	14	2.4%	2.4%	2.4%
15-Aug-18	592	609	18	18	3.0%	3.0%	2.9%
16-Aug-18	599	608	9	9	1.6%	1.6%	1.5%
17-Aug-18	588	607	19	19	3.2%	3.2%	3.1%
18-Aug-18	543	571	28	28	5.1%	5.1%	4.8%
19-Aug-18	562	565	2	2	0.4%	0.4%	0.4%
20-Aug-18	594	587	-7	7	-1.2%	1.2%	-1.2%
21-Aug-18	583	587	4	4	0.7%	0.7%	0.7%
22-Aug-18	575	584	10	10	1.7%	1.7%	1.7%
23-Aug-18	599	585	-13	13	-2.2%	2.2%	-2.3%
24-Aug-18	591	584	-6	6	-1.1%	1.1%	-1.1%
25-Aug-18	541	546	5	5	0.9%	0.9%	0.9%
26-Aug-18	543	549	6	6	1.1%	1.1%	1.1%
27-Aug-18	585	587	1	1	0.2%	0.2%	0.2%
28-Aug-18	586	584	-2	2	-0.3%	0.3%	-0.3%
29-Aug-18	586	591	5	5	0.9%	0.9%	0.9%
30-Aug-18	585	593	8	8	1.3%	1.3%	1.3%
31-Aug-18	585	591	6	6	1.1%	1.1%	1.1%
Minimum	531	546	-13	1	-2.2%	0.1%	-2.3%
Average	579	588	9	12	1.7%	2.2%	1.6%
Maximum	610	616	35	35	6.6%	6.6%	6.2%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/ Forecast
1-Sep-18	530	566	36	36	6.8%	6.8%	6.4%
2-Sep-18	534	557	24	24	4.4%	4.4%	4.2%
3-Sep-18	547	578	31	31	5.6%	5.6%	5.3%
4-Sep-18	592	584	-8	8	-1.4%	1.4%	-1.5%
5-Sep-18	561	569	8	8	1.4%	1.4%	1.4%
6-Sep-18	577	581	4	4	0.7%	0.7%	0.6%
7-Sep-18	549	579	30	30	5.4%	5.4%	5.1%
8-Sep-18	534	559	25	25	4.7%	4.7%	4.5%
9-Sep-18	564	568	4	4	0.8%	0.8%	0.8%
10-Sep-18	588	591	3	3	0.5%	0.5%	0.4%
11-Sep-18	589	587	-3	3	-0.4%	0.4%	-0.4%
12-Sep-18	626	599	-27	27	-4.3%	4.3%	-4.4%
13-Sep-18	584	580	-4	4	-0.6%	0.6%	-0.6%
14-Sep-18	591	609	18	18	3.0%	3.0%	2.9%
15-Sep-18	573	554	-19	19	-3.3%	3.3%	-3.4%
16-Sep-18	592	575	-17	17	-2.9%	2.9%	-3.0%
17-Sep-18	649	638	-11	11	-1.7%	1.7%	-1.7%
18-Sep-18	816	742	-74	74	-9.1%	9.1%	-10.0%
19-Sep-18	789	777	-12	12	-1.5%	1.5%	-1.6%
20-Sep-18	755	752	-3	3	-0.4%	0.4%	-0.4%
21-Sep-18	779	770	-9	9	-1.1%	1.1%	-1.2%
22-Sep-18	781	690	-92	92	-11.7%	11.7%	-13.3%
23-Sep-18	654	660	6	6	0.9%	0.9%	0.9%
24-Sep-18	731	708	-23	23	-3.2%	3.2%	-3.3%
25-Sep-18	804	798	-6	6	-0.7%	0.7%	-0.8%
26-Sep-18	840	834	-6	6	-0.7%	0.7%	-0.7%
27-Sep-18	645	669	24	24	3.8%	3.8%	3.7%
28-Sep-18	681	658	-24	24	-3.4%	3.4%	-3.6%
29-Sep-18	618	614	-4	4	-0.7%	0.7%	-0.7%
30-Sep-18	659	676	17	17	2.5%	2.5%	2.5%
Minimum	530	554	-92	3	-11.7%	0.4%	-13.3%
Average	643	640	-2	20	-0.2%	2.9%	-0.4%
Maximum	840	834	36	92	6.8%	11.7%	6.4%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Oct-18	740	728	-12	12	-1.6%	1.6%	-1.7%
2-Oct-18	761	772	10	10	1.4%	1.4%	1.3%
3-Oct-18	860	849	-11	11	-1.3%	1.3%	-1.3%
4-Oct-18	714	725	11	11	1.5%	1.5%	1.5%
5-Oct-18	618	688	70	70	11.3%	11.3%	10.2%
6-Oct-18	647	668	21	21	3.3%	3.3%	3.2%
7-Oct-18	778	706	-72	72	-9.3%	9.3%	-10.3%
8-Oct-18	751	728	-23	23	-3.0%	3.0%	-3.1%
9-Oct-18	864	851	-13	13	-1.5%	1.5%	-1.5%
10-Oct-18	829	840	11	11	1.4%	1.4%	1.3%
11-Oct-18	928	923	-5	5	-0.6%	0.6%	-0.6%
12-Oct-18	936	940	5	5	0.5%	0.5%	0.5%
13-Oct-18	792	817	25	25	3.1%	3.1%	3.0%
14-Oct-18	780	751	-29	29	-3.7%	3.7%	-3.8%
15-Oct-18	848	848	0	0	0.0%	0.0%	0.0%
16-Oct-18	862	841	-21	21	-2.5%	2.5%	-2.6%
17-Oct-18	833	832	-1	1	-0.1%	0.1%	-0.1%
18-Oct-18	834	833	-1	1	-0.1%	0.1%	-0.1%
19-Oct-18	905	912	8	8	0.8%	0.8%	0.8%
20-Oct-18	871	845	-25	25	-2.9%	2.9%	-3.0%
21-Oct-18	743	760	17	17	2.3%	2.3%	2.2%
22-Oct-18	808	812	4	4	0.5%	0.5%	0.5%
23-Oct-18	897	885	-12	12	-1.3%	1.3%	-1.3%
24-Oct-18	963	952	-11	11	-1.1%	1.1%	-1.1%
25-Oct-18	843	846	3	3	0.3%	0.3%	0.3%
26-Oct-18	844	853	9	9	1.1%	1.1%	1.1%
27-Oct-18	875	836	-40	40	-4.5%	4.5%	-4.7%
28-Oct-18	962	908	-54	54	-5.6%	5.6%	-5.9%
29-Oct-18	795	793	-2	2	-0.3%	0.3%	-0.3%
30-Oct-18	719	766	47	47	6.5%	6.5%	6.1%
31-Oct-18	799	858	59	59	7.4%	7.4%	6.9%
Minimum	618	668	-72	0	-9.3%	0.0%	-10.3%
Average	819	818	-1	20	0.1%	2.6%	-0.1%
Maximum	963	952	70	72	11.3%	11.3%	10.2%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Peak, MW	Forecast Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Nov-18	943	896	-46	46	-4.9%	4.9%	-5.2%
2-Nov-18	844	856	12	12	1.4%	1.4%	1.4%
3-Nov-18	873	852	-22	22	-2.5%	2.5%	-2.5%
4-Nov-18	915	950	35	35	3.8%	3.8%	3.7%
5-Nov-18	959	1018	59	59	6.2%	6.2%	5.8%
6-Nov-18	968	1085	117	117	12.1%	12.1%	10.8%
7-Nov-18	891	941	49	49	5.5%	5.5%	5.2%
8-Nov-18	896	905	9	9	1.0%	1.0%	1.0%
9-Nov-18	678	628	-50	50	-7.4%	7.4%	-8.0%
10-Nov-18	1071	959	-112	112	-10.4%	10.4%	-11.7%
11-Nov-18	1017	996	-21	21	-2.1%	2.1%	-2.1%
12-Nov-18	1096	1083	-13	13	-1.2%	1.2%	-1.2%
13-Nov-18	1050	1087	37	37	3.5%	3.5%	3.4%
14-Nov-18	1178	1221	43	43	3.7%	3.7%	3.5%
15-Nov-18	1250	1237	-13	13	-1.1%	1.1%	-1.1%
16-Nov-18	1182	1172	-10	10	-0.9%	0.9%	-0.9%
17-Nov-18	1116	1142	26	26	2.4%	2.4%	2.3%
18-Nov-18	1121	1113	-8	8	-0.7%	0.7%	-0.7%
19-Nov-18	729	750	21	21	2.9%	2.9%	2.8%
20-Nov-18	1094	1130	35	35	3.2%	3.2%	3.1%
21-Nov-18	1028	1070	42	42	4.1%	4.1%	3.9%
22-Nov-18	1127	1124	-2	2	-0.2%	0.2%	-0.2%
23-Nov-18	1308	1311	4	4	0.3%	0.3%	0.3%
24-Nov-18	1284	1273	-11	11	-0.9%	0.9%	-0.9%
25-Nov-18	1185	1156	-29	29	-2.4%	2.4%	-2.5%
26-Nov-18	1124	1114	-10	10	-0.9%	0.9%	-0.9%
27-Nov-18	1145	1098	-47	47	-4.1%	4.1%	-4.2%
28-Nov-18	1133	1106	-27	27	-2.4%	2.4%	-2.5%
29-Nov-18	1083	1158	75	75	7.0%	7.0%	6.5%
30-Nov-18	1183	1124	-59	59	-5.0%	5.0%	-5.2%
Minimum	678	628	-112	2	-10.4%	0.2%	-11.7%
Average	1049	1052	3	35	0.3%	3.5%	0.1%
Maximum	1308	1311	117	117	12.1%	12.1%	10.8%

Table 3 - Analysis of Utility Forecast Error (continued)

Date	Actual Peak, MW	Forecast Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/Forecast
1-Dec-18	1094	1081	-13	13	-1.2%	1.2%	-1.2%
2-Dec-18	1094	1087	-7	7	-0.6%	0.6%	-0.6%
3-Dec-18	1163	1171	8	8	0.7%	0.7%	0.7%
4-Dec-18	1146	1123	-23	23	-2.0%	2.0%	-2.0%
5-Dec-18	1306	1265	-41	41	-3.1%	3.1%	-3.2%
6-Dec-18	1322	1277	-45	45	-3.4%	3.4%	-3.5%
7-Dec-18	1237	1283	45	45	3.7%	3.7%	3.5%
8-Dec-18	1227	1142	-85	85	-7.0%	7.0%	-7.5%
9-Dec-18	678	628	-50	50	-7.4%	7.4%	-8.0%
10-Dec-18	1295	1249	-45	45	-3.5%	3.5%	-3.6%
11-Dec-18	1283	1255	-28	28	-2.2%	2.2%	-2.2%
12-Dec-18	1296	1246	-51	51	-3.9%	3.9%	-4.1%
13-Dec-18	1334	1308	-26	26	-2.0%	2.0%	-2.0%
14-Dec-18	1297	1274	-22	22	-1.7%	1.7%	-1.7%
15-Dec-18	1161	1200	39	39	3.3%	3.3%	3.2%
16-Dec-18	1214	1216	2	2	0.1%	0.1%	0.1%
17-Dec-18	1236	1207	-29	29	-2.3%	2.3%	-2.4%
18-Dec-18	1117	1237	120	120	10.7%	10.7%	9.7%
19-Dec-18	729	750	21	21	2.9%	2.9%	2.8%
20-Dec-18	1278	1236	-42	42	-3.3%	3.3%	-3.4%
21-Dec-18	1203	1201	-2	2	-0.1%	0.1%	-0.1%
22-Dec-18	1163	1120	-42	42	-3.6%	3.6%	-3.8%
23-Dec-18	1069	1112	43	43	4.1%	4.1%	3.9%
24-Dec-18	1271	1284	13	13	1.0%	1.0%	1.0%
25-Dec-18	1262	1307	45	45	3.6%	3.6%	3.4%
26-Dec-18	1312	1337	25	25	1.9%	1.9%	1.9%
27-Dec-18	1331	1309	-21	21	-1.6%	1.6%	-1.6%
28-Dec-18	1455	1408	-46	46	-3.2%	3.2%	-3.3%
29-Dec-18	1379	1350	-29	29	-2.1%	2.1%	-2.1%
30-Dec-18	1237	1214	-23	23	-1.8%	1.8%	-1.9%
31-Oct-16	1443	1384	-59	59	-4.1%	4.1%	-4.3%
Minimum	678	628	-85	2	-7.4%	0.1%	-8.0%
Average	1214	1202	-12	35	-0.9%	3.0%	-1.0%
Maximum	1455	1408	120	120	10.7%	10.7%	9.7%

Table 4 - Monthly Peak Utility Load Error Summary - Average Error

	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/ Forecast
Nov 2017	987	1006	18	36	1.8%	3.7%	1.6%
Dec 2017	1194	1213	19	44	1.7%	3.8%	1.5%
Jan 2018	1285	1319	34	44	2.9%	3.6%	2.7%
Feb 2018	1279	1312	33	36	2.6%	2.9%	2.5%
Mar 2018	1132	1137	10	20	0.9%	1.8%	0.8%
Apr 2018	1031	1044	14	30	1.5%	3.0%	1.3%
May 2018	851	859	8	26	1.2%	3.0%	1.0%
Jun 2018	776	777	1	19	0.2%	2.5%	0.1%
Jul 2018	592	599	7	14	1.3%	2.4%	1.2%
Aug 2018	579	588	9	12	1.7%	2.2%	1.6%
Sep 2018	643	640	-2	20	-0.2%	2.9%	-0.4%
Oct 2018	819	818	-1	20	0.1%	2.6%	-0.1%
Nov 2018	1049	1052	3	35	0.3%	3.5%	0.1%
Dec 2018	1214	1202	-12	35	-0.9%	3.0%	-1.0%
Total Average (Nov 2017 to Dec 2018)	959	969	10	28	1.1%	2.9%	0.9%

Table 5 - Monthly Peak Utility Load Error Summary - Maximum Error

	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/ Forecast
Nov 2017	1170	1216	73	126	7.1%	11.7%	6.6%
Dec 2017	1511	1456	130	130	11.5%	11.5%	10.3%
Jan 2018	1461	1478	180	180	13.9%	13.9%	12.2%
Feb 2018	1454	1495	116	116	9.4%	9.4%	8.6%
Mar 2018	1300	1236	77	77	7.6%	7.6%	7.0%
Apr 2018	1203	1248	109	109	11.6%	11.6%	10.4%
May 2018	1021	1006	88	88	11.1%	11.1%	10.0%
Jun 2018	1048	1047	76	76	11.1%	11.1%	10.0%
Jul 2018	625	641	41	41	7.1%	7.1%	6.6%
Aug 2018	610	616	35	35	6.6%	6.6%	6.2%
Sep 2018	840	834	36	92	6.8%	11.7%	6.4%
Oct 2018	963	952	70	72	11.3%	11.3%	10.2%
Nov 2018	1308	1311	117	117	12.1%	12.1%	10.8%
Dec 2018	1455	1408	120	120	10.7%	10.7%	9.7%
Annual	1511	1495	180	180	13.9%	13.9%	12.2%

Note that the maximum forecast, the maximum peak and the maximum error do not necessarily occur on the same day

Table 6 - Error in Ten Highest Utility Loads

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Percent Error	Absolute Percent Error	Actual/ Forecast
27-Dec-17	1511	1456	-55	55	-3.6%	3.6%	-3.7%
10-Jan-18	1461	1452	-10	10	-0.7%	0.7%	-0.7%
8-Jan-18	1459	1442	-17	17	-1.2%	1.2%	-1.2%
22-Jan-18	1458	1449	-9	9	-0.6%	0.6%	-0.6%
28-Dec-18	1455	1408	-46	46	-3.2%	3.2%	-3.3%
23-Feb-18	1454	1477	24	24	1.6%	1.6%	1.6%
14-Feb-18	1450	1481	31	31	2.2%	2.2%	2.1%
7-Jan-18	1444	1449	5	5	0.3%	0.3%	0.3%
31-Dec-18	1443	1384	-59	59	-4.1%	4.1%	-4.3%
26-Feb-18	1441	1451	9	9	0.6%	0.6%	0.6%
Average	1458	1445	-13	27	-0.9%	1.8%	-0.9%

Table 7 - Summary of Forecast Issues

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Absolute Percent Error	Explanation
7-Nov-17	879	935	56	56	6.4%	Error in industrial load; error in temperature and wind speed forecast
11-Nov-17	1071	945	-126	126	-11.7%	Error in cloud cover forecast; unusual temperature trend; non-uniform customer behaviour (holiday and weekend)
25-Nov-17	995	1065	70	70	7.1%	Error in weather forecast
2-Dec-17	1083	1150	67	67	6.2%	Error in industrial load; error in wind speed and cloud cover forecast
11-Dec-17	1138	1200	62	62	5.5%	Error in industrial load; error in weather forecast
24-Dec-17	1126	1256	130	130	11.5%	Error in cloud cover forecast; non-uniform customer behaviour (holiday and weekend)
13-Jan-18	918	1028	110	110	12.0%	Error in temperature forecast; unusual temperature for the time of year
27-Jan-18	1298	1478	180	180	13.9%	Error in weather forecast
28-Jan-18	1172	1283	111	111	9.5%	Error in industrial load
11-Feb-18	1141	1231	90	90	7.9%	Error in weather forecast
13-Feb-18	1427	1495	68	68	4.7%	Error in industrial load; error in temperature and wind speed forecast
20-Feb-18	1234	1350	116	116	9.4%	Error in weather forecast
23-Mar-18	1103	1104	1	1	0.1%	Error in industrial load
30-Mar-18	1009	1086	77	77	7.6%	Error in weather forecast
2-Apr-18	1000	1085	86	86	8.6%	Error in temperature forecast
21-Apr-18	974	1049	75	75	7.7%	Error in industrial load; error in temperature forecast
22-Apr-18	942	1051	109	109	11.6%	Error in weather forecast
6-May-18	791	879	88	88	11.1%	Error in temperature forecast
16-May-18	740	794	55	55	7.4%	Error in industrial load and temperature forecast
19-May-18	750	818	68	68	9.0%	Error in industrial load; error in temperature and wind speed forecast
10-Jun-18	704	763	59	59	8.4%	Error in temperature and cloud cover forecast
16-Jun-18	688	764	76	76	11.1%	Error in temperature forecast; error in the industrial forecast
27-Jun-18	793	823	30	30	3.8%	Error in industrial load; error in temperature forecast

Table 7 - Summary of Forecast Issues (continued)

Date	Actual Utility Peak, MW	Forecast Utility Peak, MW	Error, MW	Absolute Error, MW	Absolute Percent Error	Explanation
2-Jul-18	599	641	41	41	6.9%	Error in industrial load; error in wind speed and cloud cover forecast
5-Jul-18	577	605	29	29	5.0%	Error in industrial load
11-Jul-18	588	583	-5	5	-0.9%	Error in industrial load
9-Aug-18	567	596	30	30	5.3%	Error in industrial load
17-Aug-18	588	607	19	19	3.2%	Error in industrial load
21-Aug-18	583	587	4	4	0.7%	Error in industrial load
3-Sep-18	547	578	31	31	5.6%	Error in industrial load
7-Sep-18	549	579	30	30	5.4%	Error in industrial load
8-Sep-18	534	559	25	25	4.7%	Error in industrial load
5-Oct-18	618	688	70	70	11.3%	Error in weather forecast
30-Oct-18	719	766	47	47	6.5%	Error in industrial load; error in temperature forecast
31-Oct-18	799	858	59	59	7.4%	Error in industrial load; error in wind speed forecast.
6-Nov-18	968	1085	117	117	12.1%	Error in the industrial load forecast and non-uniform customer behaviour
7-Nov-18	891	941	49	49	5.5%	Error in industrial load; error in wind speed and cloud cover forecast
8-Nov-18	896	905	9	9	1.0%	Error in industrial load
7-Dec-18	1237	1283	45	45	3.7%	Error in industrial load; error in wind speed forecast
8-Dec-18	1227	1142	-85	85	-7.0%	Error in weather forecast and non-uniform customer behaviour (weekend)
18-Dec-18	1117	1237	120	120	10.7%	Error in weather forecast